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ADMINISTRATION

55-01 Follow-up on Defective Amalgam Capsules

Problems with mercury release from Kerr amalgam capsules during trituration were identified to DIS in August 1997. This was the subject of a lengthy DIS Problem Resolution Assistance Program (PRAP) that was closed in April 1998. In this PRAP Kerr confirmed a defective amalgam capsule design inherited from SS White. Mercury ejection during trituration was replicated and confirmed in the DIS dental materials testing laboratory. Kerr spent considerable effort and expense in amalgam capsule modifications that were reported to remedy the problem.

Since the close of the PRAP, DIS has received additional mercury ejection reports involving Kerr capsules from four federal dental facilities. Capsule examination reveals that those implicated are of the newer modification which is purported to solve the mercury release problem. DIS testing has confirmed mercury release contamination from these new capsules. DIS communications with Kerr confirmed problem areas still potentially exist with mercury ejection and that Kerr is attempting further modifications in both capsule design and assembly processes to rectify this problem.

Federal clinics should maintain heightened awareness that mercury ejection from Kerr capsules is still both a real and potential problem. Amalgamators should be routinely checked for mercury contamination and other debris. If mercury contamination is seen or suspected, dental facilities should contact local base biomedical engineers for decontamination. If any clinic is experiencing dry mixes or has suspicious amalgamator debris, please contact Lt Col Roberts DSN 792-7679 or roberts@ndri.med.navy.mil

(Lt Col Roberts)

55-02 In-House Biological Indicators Revisited

An oversight by DIS personnel led to the exclusion of some pertinent information in the Synopsis of Biological Indicators (Project 98-07) featured in DIS #54-17. The synopsis table has been corrected and is featured as Attachment 5 in this issue. DIS apologizes for any inconvenience this error may have caused.

(SSgt Martin)

55-03 Simplified Electronic Means of Filing SF 380 Forms to DSCP

The medical materiel complaint is the customer's method of making Defense Supply Center Philadelphia, DSCP (formerly DPSC) aware of defects or deficiencies that may exist with a medical product. This subject was covered in detail in Dental Items of Significance # 53. A more efficient method of submitting SF 380 forms is now available at the US Army Medical Material Agency (USAMMA) home page at <http://140.139.13.36/usamma/index.htm>. Click the SF 380 button at the bottom right of the USAMMA homepage and complete the form as directed. An information paper concerning medical materiel complaints with instructions for completing the electronic SF 380 are available options on the USAMMA homepage. After completing the electronic SF 380, please print a copy before submitting the form to DSCP and fax it to DIS. A similar SF 380 submission process will soon be available at the DSCP homepage at <http://www.dpdc.dla.mil>.

(Lt Col Roberts)

55-04 Meeting the DIS Staff

In each issue of the *Dental Items of Significance*, we feature a different member of the DIS staff and provide some brief biographical information about him or her. We hope that in providing a brief biography of the staff, we will become more familiar to you so that when you call with a question or to discuss a matter, you will feel that you have a friend at the other end of the line. This issue's staff member is Col Joseph Bartoloni.

Joe, born and raised in the Boston area, has a pronounced New England accent. In 1976, he received his BS degree in Biology from St. Lawrence University in Canton, New York. Joe followed that with a DMD degree from the University of Pennsylvania School of Dental Medicine in 1980. Upon graduation from dental school, he entered the US Navy and was assigned to Little Creek Amphibious Base in Virginia Beach, Virginia. Dr Bartoloni separated from the Navy in 1983 and tried his hand at a private practice in his home state of Massachusetts. By 1986, Joe had realized the horror of his mistake and returned to the military fold by signing up with the Air Force. His first assignment with the folks in blue was at Castle AFB, California. He was there for four years before volunteering for an assignment to Andersen AFB, Guam in 1990. Yearning for more fun, Joe applied for a general dentistry residency in 1992 and was relocated to Keesler AFB for a one-year period prior to entering the residency. After completing the residency, Dr Bartoloni was assigned to Randolph AFB, Texas. In 1997, he moved to his current position at DIS as the OIC of Professional Services. He is board certified by the Federal Services Board of General Dentistry. Joe, his wife Nancy, and their golden retriever Tequila reside in Universal City, Texas.

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 a question about cracks in ring-less investment molds. 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.

55-04 Cracks in Ring-less Investment Molds

Question: I have been trying the ring-less casting method with the rapid burnout technique and have experienced cracks in the molds when they are removed from the burnout oven. I am using an investment designed for the ring-less/rapid burnout technique and I have not changed any of my other techniques. The castings still fit well and there is no finning. How can I prevent cracks in the investment mold?

Answer: Several factors cause cracks in investment molds. Since there is no finning, the cracks are not very deep. This leads me to believe there is rapid steam expansion on the surface of the investment. You are probably rinsing the mold after scraping the top of the mold or, you are wet trimming the mold. Dampening the mold introduces water on to the surface that causes rapid steam expansion and cracks. Carefully scrape the top and then inspect the sprue area. Remove any debris with an instrument and place the mold in the furnace.

(MSgt Ryerson)

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.



The **QHL 75™** is a new economy visible light curing unit from Dentsply/Caulk. The standard unit includes the curing light, an 8-mm light guide with 60 degree angle, eye protection shield, and 75-watt halogen bulb. The activation trigger is ergonomically located on the handpiece. An acoustic signal every 10 seconds indicates the duration of polymerization, however there is no timer to set a specific curing interval. The unit is reported to be one of the quietest units in its class and the halogen bulb is reported to last 100 hours. The QHL 75™ is available from Dentsply/Caulk (800) 532-2855 for \$479.25 (retail) and \$311.00 (government).

(Col Leonard)

Alloy Primer from J. Morita USA is an acetone-based liquid primer that is advertised to eliminate tin plating for gold and semi-precious alloys. J. Morita's instructions state to "simply apply Alloy Primer to sandblasted metal surface and let it dry". Alloy Primer reportedly increases Panavia 21's bond strength to gold and semi-precious metals by 45 and 100 percent, respectively. The manufacturer states that Alloy Primer is compatible with acrylic or composite resins and can be used for metal adhesion during fixed and removable prosthesis fabrication or repair. J. Morita states that Alloy Primer is approved for intraoral use and the five-milliliter bottle provides approximately 200 applications with a two-year shelf life. Alloy Primer is available for \$69.95 (retail) and \$42.00 (government) at (800) 752-9720, (714) 544-2854, (714) 730-1048 FAX, or maryj@jmorita.com.

(Lt Col Roberts)

The 5 Minute Clinical Consult for Dental Professionals is a medical resource text published by Williams & Wilkins designed to provide ready access to over 250 medical entities that may present during patient care. Medical conditions are alphabetically arranged with headings and subheadings outlined for quick subject review. This text combines background medical information including etiology, diagnosis, and therapy, along with early emergency care procedures. Physician consultation and referral recommendations are outlined as well as concurrent therapy that may affect dental treatment plans. ADA, medical (CPT), and diagnostic (ICD) treatment codes are provided for insurance reference. Each entity narrative ends with both cross-references and literature sources for further information. This 609-page text (ISBN# 0683042793) costs \$49.95 and may be ordered from Williams & Wilkins at (800) 638-0672 or (410) 528-4339.

(Lt Col Roberts)

CoJet® Silicate Ceramic Surface Treatment System is a silicate ceramic sand marketed by ESPE America for use in microetchers. ESPE claims that sandblasting with CoJet® Sand embeds a ceramic layer on metal, porcelain, or previously cured composite surfaces that dramatically enhances bond strength. This ceramic layer is purported to allow silane coupling with resins, and may be used for either extra- or intraoral bonding or repair. The CoJet® Introductory Package includes three 40-g bottles

of CoJet® Sand, two 5-g bottles of Visio®-Gem Opaquers, one 8-ml bottle Visio®-Gem Opaquer liquid, one 2.5-ml bottle Visio-Bond Bonding Agent, one 8-ml bottle ESPE-Sil Silane Coupling Agent, two brush handles with 50 disposable brush tips, and instructions. The CoJet® Sand Introductory Package is available for \$139.00 (retail), \$88.90 (government) from ESPE America (800) 344-8235, (610) 277-3800, or www.espeusa.com.

(Lt Col Roberts)

Compolute® Aplicap® is the first resin luting cement available in a capsule delivery system. ESPE America markets Compolute® Aplicap® and describes this luting cement as a dual-curing multipurpose cement for full porcelain or composite restorations as well as porcelain-fused-to-metal crowns that require enhanced adhesion. Compolute® Aplicap's® capsule delivery is purported to require no measuring or hand mixing, facilitates infection control via unit dose format, allows consistent and homogenous mixes, provides direct application into the restoration, and ensures exact setting times with every mix. Four cement shades are available: Chameleon/Neutral, A2 Translucent, A3 Translucent, and A3 Opaque. Dentin bonding agents are recommended for resin luting cements and ESPE includes the EBS-Multi Bonding System with the Introductory Set. The Compolute® Aplicap® Introductory Set contains one Applier and Activator; 40 capsules (ten each of above-listed shades); 5 ml each of EBS-Multi Primer and EBS-Multi Bond, 50 primer and bond brushes, 2.5 grams of MiniTip Etching Gel with 50 application tips; mixing pads, and instructions. The Compolute® Aplicap® Introductory Set is available for \$270.00 (retail), \$166.75 (government) from ESPE America (800) 344-8235, (610) 277-3800, or www.espeusa.com.

(Lt Col Roberts)

DermaMed by Benchmark Medical, Inc. is a skin protectant which is said to safeguard injured or exposed skin surfaces from harmful stimuli. This product was formulated for hospital personnel to help maintain intact skin. It is purported to protect skin against chafing, chapping, and cracking. It is a hypoallergenic, non-greasy protectant which can be applied to any area of the skin. Studies have shown DermaMed to be completely compatible with latex products. This preparation will provide up to 4 hours of skin protection per application, does not interfere with normal skin function, will not support microbial growth, and resists washing off. DermaMed is available in a foam or lotion. Please note that DermaMed does contain methylparaben, and is not a substitute for gloves. Government prices are as follows:

<u>Item Description</u>	<u>Price</u>
DermaMed 2 oz (12 cans/case) Approximately 70 applications/can	\$150.48
DermaMed 6 oz (12 cans/case) Approximately 210 applications/can	\$287.79
DermaMed 17 oz (6 cans/case) Approximately 596 applications/can	\$219.45
DermaMed 16 oz (12 cans/case) Liquid	\$307.23
Dispenser 17 oz	\$31.30

Please contact Gamble Enterprises Inc. (800) 707-9084 for further information.

(Col Bartoloni)

Dentsply/Midwest recently introduced the **Midwest Tradition PB High-Speed Handpiece** and **Midwest Push Button Low-Speed Angles**. The handpiece and angles are essentially unchanged from previous models except for the convenience of a push button bur release. The push button low speed angles are available for either friction grip or latch type burs and are compatible with either the Midwest Rhino or Shorty motors. The handpieces can be sterilized in either steam or chemical vapor sterilizers. The Tradition PB Fiberoptic sells for \$775.00 (retail) and \$387.60 (government). The non-fiberoptic model costs \$490.00 (retail) and \$232.05 (government). The low speed angles are priced at \$189.00 (retail) and \$85.00 (government). For more information, contact Dentsply/Midwest at (800) 800-2888.

(Col Leonard)

Bausch Articulating Materials is distributing several new products in the United States. These articulating marking materials come in single-sided or double-sided versions and are purportedly constructed of high tensile strength mylar, silk, or paper. Various thicknesses are available for most chairside and laboratory applications. Arti-Fol, single-sided or double-sided, is the thinnest offering at 8 microns. The other thicknesses available are 19, 40, 80, and 200 microns. The 200 micron articulating paper has progressive color transfer to reveal pressure distribution. The materials are dispensed as 15-, 35-, 40-, and 50-meter rolls or in booklets. Refills are available for the roll dispenser. Widths available include 16, 22, 70, and 75 mm. The articulating materials come in 4 colors: red, blue, green, and black. Bausch Articulating Materials range in price from \$5.25 to \$19.12 and can be purchased from New England Dental (800) 545-8057.

(MSgt Ryerson)

Creapast is a premixed paste opaquer packaged in disposable syringes. It purportedly has a final application thickness that is 66% less than conventional powder opaques. Complete coverage of a coping is achieved in two applications. The kit contains 16 shades keyed to the Vita-Lumin shade guide. Four modifiers (white, ochre, violet, and gold) are also included in the kit. Each syringe is the equivalent of a 20-g bottle of opaque powder. It is compatible with all alloys and porcelains except Duceram porcelain. In company sponsored testing, the entire Creation porcelain system, including Creapast, matched the Vita-Lumin shade guide closer than other similar products. Creapast can be purchased from Jensen Industries (800) 243-2000 for \$379.00.

(MSgt Ryerson)

FastFire 15 is a carbon-free, fine-grain, phosphate-bonded investment for all casting alloys. It is formulated for use with a rapid burnout technique. This investment bench sets for 15 minutes and is placed in a hot burnout furnace for 30 minutes prior to casting. It can be used with either the metal ring or ring-less technique. Castings are purported to be accurate and smooth. The special liquid can be shipped during winter months. The investment comes in three different size pre-measured pouches and a twenty-pound carton including liquid. A box of twenty-five 90-g envelopes and two 340-ml bottles of special liquid sells for \$41.45. FastFire 15 can be purchased from Whip Mix (800) 626-5651.

(MSgt Ryerson)

Restore is an ultrasonic cleaner and instrument protectant (tetrasodium ethylenediaminetetraacetate) that is reported to restore and protect stainless steel dental instruments during cleaning. Restore can be utilized either in an ultrasonic unit, diluted one-half fluid ounce to one-half gallon of water, or full strength as a pre-soak. Restore used in an ultrasonic unit is purported to prevent surface corrosion and maintain surface integrity of instruments while it cleans. Used full strength as a pre-soak, Restore claims to remove corrosion and refurbish previously corroded and stained instruments. Restore is an alkaline liquid cleaner (pH 10.8-11.4) that can be used in place of standard ultrasonic solutions. Restore is not recommended for anodized aluminum. Restore is available in four 32-oz bottles for 247.00 (retail) and \$135.85 (government) from Biotrol International (800) 822-8550.

(Col Bartoloni)

Opalustre™ is a new enamel microabrasion slurry from Ultradent. Opalustre™ is purported to eliminate unsightly enamel decalcification defects that are less than 0.2 mm in depth. Ultradent claims the product is ideal for superficial white and brown "dysmineralization". Opalustre™ is comprised of hydrochloric acid and silicon carbide particles suspended in a water-soluble paste and delivered via a pre-filled 1.2-cc syringe. An introductory kit (Item #UP 554) is available from Ultradent (800) 552-5512 for \$58.75 (retail) and \$49.94 (government).

(SSgt Martin)

Ultradent has also recently introduced **UltraLEVE™**, a sustained release potassium nitrate desensitizing gel. UltraLEVE™ is indicated by the manufacturer to be used for sensitivity associated with brushing, thermal and chemical changes, tooth bleaching, and root exposures. It is a 3% solution of potassium nitrate desensitizing agent in gel form and contains 0.11% w/w fluoride ion. UltraLEVE™ is intended for

use with custom trays and treatment time may vary from 15 minutes to several hours. The product is purported to have a shelf-life of 24 months. UltraLEVE™ is available in a kit of twenty 1.2-cc syringes (Item #UP 420) from Ultradent (800) 552-5512 for \$42.50 (retail) and \$36.13 (government).

(Ssgt Martin)

Perma Sharp™ Suture Needles are now available from Hu-Friedy. This suture needle is said to have a finer point geometry for smoother penetration and less tissue disruption. Constructed of 300 series stainless steel, the Perma Sharp™ is purported to require up to 20% less force for penetration and offers increased ductile strength. Using a unique laser-drilled process, this product is adjusted to the size of the suture material. Hu-Friedy claims this will reduce tissue disruption and provides a smooth transition from the needle to the material. The product comes in a variety of standard needle sizes and shapes in both non-absorbable and absorbable materials. Structured pricing information for government facilities and educational programs is available from Hu-Friedy (800) 729-3743.

(SSgt Martin)

CETRA Latex-Free markets a large variety of latex-free dental and medical supplies. Their catalog includes latex-free gloves, rubber dams, prophylaxis cups, bite blocks, saliva ejectors, etc. For product information, call (888) 528-3966 or access their website at www.latexfree.com. Visit the Education for Latex Allergy/Support Team & Information Coalition (ELASTIC) at <http://pw2.netcom.com/~ecbdmd/elastic.html> for an overview of other latex-free dental products. ELASTIC provides a list of companies, telephone numbers, and products that may be latex-free. For additional information on latex allergy concerns and latex-free products, refer to DIS #52-08.

(TSgt Springstead)

The **DenOptix Digital Imaging System** introduced by Dentsply Gendex utilizes photo-stimulated phosphor technology to provide digital radiographs. DenOptix uses reusable storage-phosphor imaging plates that are flexible and are designed to be positioned like conventional periapical radiographic film (sizes 0-4). This system can be upgraded to include digital panoramic images. Unlike CCD technology, the DenOptix system eliminates cables or sensors. This system can be used with any existing AC or DC intraoral and panoramic x-ray equipment. The imaging plates are less light sensitive than conventional film and can be exposed to low-level room light without sacrificing image quality. Disposable barrier envelopes are provided to protect the imaging plates. These plates can be disinfected or barrier protected. After image capture, the plates are placed in a scanner to convert the data into electronic files for viewing on a monitor, and can be stored on any medium preferred by the provider. Processing time is approximately 1 minute 26 seconds for 8 intraoral images and 3-4 minutes for a panoramic image. The DenOptix system allows for printed images using a standard laser printer. The Combo Scanner System is priced at \$21,538.00 (retail) and \$14,000.00 (government). The Combo Scanner System consists of a DenOptix laser scanner, both panoramic and intraoral carousel, VixWin software, 500 barriers, one panoramic imaging plate and 20 intraoral imaging plates (four in size 0, two in size 1, twelve in size 2, and two in size 3). The DenOptix Imaging System has FDA clearance to market and will work with existing X-ray units from other manufacturers. Please note the computer and monitor are not provided by the manufacturer. The DenOptix Imaging System is available from the Gendex Dental X-Ray Division (847) 640-5323.

(Col Bartoloni)

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.

THERE ARE NO SCIENTIFIC STUDIES

DEMONSTRATING ANY DETRIMENTS TO DENTAL AMALGAM

ADA Council on Scientific Affairs. Dental amalgam: update on safety concerns. J Am Dent Assoc 1998;129:494-503.

This ADA Council on Scientific Affairs report reviewed recent scientific published studies concerning amalgam safety since the 1993 US Public Health Service review. This summary addressed amalgam health aspects concerning both dental professionals and patients and focused on over 70 recently published scientific studies. Less than one percent of the population may have true allergic reactions to mercury, as well as other metals found in the composition of amalgam. There is little doubt that minute levels of mercury are released from amalgam, but no evidence has been presented that links amalgam with adverse health effects. **The available scientific information and demonstrated benefits of dental amalgam offer no justification for discontinuing the use of dental amalgam at this time.**

AN IMPORTANT ENTITY TO INCLUDE IN YOUR TMD DIFFERENTIAL DIAGNOSIS

Masticatory muscle pain: an important indicator of giant cell arteritis. Hayreh SS. Special Care in Dentistry 1998;18(2): 60-65.

Giant cell arteritis (GCA) also called temporal arteritis or cranial arteritis, is a polysymptomatic disease that carries a high risk of permanent blindness. GCA is listed as a prime ophthalmologic medical emergency in which prompt diagnosis can prevent blindness. A disease that usually affects patients 50 years and older, GCA is also associated with an increased risk of cerebrovascular accidents and myocardial infarctions. Patients with GCA can present to the dentist with headache, tender temporal artery/temporalis region, or myofascial-type pain complaints. This article involved a 21-year prospective study that compared initial patient symptoms to those confirmed with GCA via definitive diagnosis of temporal artery biopsy. **The most significant ($p < 0.0001$) symptom in GCA patients was jaw claudication.** Jaw claudication is defined as jaw or ear pain when the patient chews food. The pain is exacerbated as the patient continues to chew but ceases when chewing stops. This pain is due to muscle ischemia from GCA-induced thrombosis of the regional arteries and may present bilaterally. Neck pain was also a significant ($p < 0.0003$) finding. **Consider GCA with older patients who present with TMD symptoms. A timely diagnosis can be sight saving!**

IS ZINC AS IMPORTANT AS COPPER IN THE SURVIVAL OF AMALGAM RESTORATIONS?

The influence of the amalgam alloy on the survival of amalgam restorations: a secondary analysis of multiple controlled clinical trials. Letzel H, Van 'T Hof MA, Marshall GW, Marshall SJ. J Dent Res 1997;76(11):1787-1798.

Data from 14 independent, controlled clinical trials regarding Class I and Class II amalgam restoration survival were evaluated by both meta- and secondary analysis. The data involved 3,119 restorations with 24 different alloys placed by seven operators with a five- to fifteen-year follow-up period. Reasons for failure were assessed as either restoration-(material), restorative process-(operator), or patient-related failures. With the restoration-related failures, survival functions were analyzed by alloy class and composition. Analysis revealed that 481 restorations failed, of which 77 percent were restoration-related. Low-copper, zinc-free restorations had the lowest survival rate. After 13 years, only 25 percent survived. The highest survival group was the high-copper, zinc-containing amalgams, of which 85 percent survived at 13 years. High-copper, zinc-free amalgams revealed a 70 percent survival

rate. The surprising finding was that low-copper, zinc-containing amalgams had the same survival rate (70 percent) as the high-copper, zinc-free restorations. **This study contends that the zinc content in amalgam alloys may be just as important as the percentage of copper.**

ENAMEL SEAL KEY TO PREVENTING CARIES PROGRESSION

Ultraconservative and cariostatic sealed restorations: results at year 10. Mertz-Fairhurst EJ, Curtis JW, Ergle J, Rueggeberg FA, Adair SM. J Am Dent Assoc 1998;129:55-66.

Since the introduction of pit and fissure sealants, practitioners have been concerned about the consequences of sealing in undiagnosed caries. The purpose of this article was to provide the results at ten years of a study that compared the efficacy of treating carious teeth with traditional Class 1 amalgam restorations versus sealed composite or amalgam restorations. One hundred twenty three patients received at least two restorations in permanent molars or premolars that had radiographically and clinically obvious occlusal caries that extended into the dentin but less than halfway between the pulp and DEJ as observed on bitewing radiographs. Each patient received one of two amalgam restorations (Dispersionalloy, LD Caulk): AGU: traditional Class 1 amalgam restoration in which all caries was excavated and the preparation was extended into all pits and fissures ("extension for prevention"); AGS: only soft demineralized dentin was removed in the localized area of the carious lesion and the preparation was not extended into non carious adjacent pits and fissures. Following amalgam placement, a sealant (Delton, LD Caulk) was placed over the amalgam and pits and fissures. In addition, each patient received a composite restoration, CompS/C: the only preparation consisted of a 45-60 degree bevel in the enamel immediately overlying the frank cavitated lesion. The bevel was placed on sound enamel and no caries or undermined enamel were removed. The bevel was etched, bonded and a self-curing composite (Miradapt, Johnson & Johnson) placed. After occlusal adjustment, the occlusal surface was etched and a sealant placed over the composite and all pits and fissures. At this ten year evaluation, 85 pairs, or 54% of the original restorations pairs were available for evaluation by Ryge criteria. Standardized bitewing radiographs were used to assess the status of carious lesions which were not excavated at the original restoration placement. At year 10, 16% of the CompS/C and 25% of the AGS restorations had complete sealant retention; 54% and 57% had partial sealant retention respectively. Fifty-six percent of the AGU restorations had no open margins, 70% of the CompS/C and 84% of the AGS restorations had no open margins. The CompS/C and AGS groups were statistically equivalent to each other in terms of marginal integrity and both were significantly better than AGU. Of the restorations available for recall at 10 years, one each of the CompS/C (1/85) and AGS (1/44) groups had failed due to marginal caries, whereas 7/44 of the AGU failures were due to marginal caries. Bitewing radiographs demonstrated no evidence of carious lesion progression under either of the sealed restoration types. **The authors note that the results of this study should provide practitioners with reassurance that inadvertently retained small carious lesions that are covered by pit and fissures sealants should not progress providing the enamel seal is maintained.** They also recommend that Class 1 amalgam restorations be sealed following placement.

THIS ARTICLE CHALLENGES EARLIER-TAUGHT TENETS OF CARDIOVASCULAR PATIENT MANAGEMENT

Interpreting vital sign profiles for maximizing patient safety during dental visits. Raab FJ, Schaeffer EM, Guillaume-Cornelissen G, Halberg F. J Am Dent Assoc 1998;129:461-469.

Previous cardiovascular patient management advocated epinephrine avoidance combined with early morning patient appointments. Early morning appointments supposed that the patient would be better rested and able to withstand cardiovascular stress challenges. The purpose of this investigation was to use circadian analysis with ambulatory cardiovascular monitoring of blood pressure and heart rate associated with both root planing and periodontal surgery. Twenty-four patients were monitored continuously both 48 hours before and after either periodontal surgery or root planing appointments. Epinephrine-containing local anesthetic did not elevate heart rate or blood pressure as compared to an epinephrine-free control. Periodontal surgery was not associated with increased heart rate or blood pressure compared to root planing. For surgical appointments, time of day had the greatest effect with highest elevations during early morning appointments and largest blood pressure decreases found for afternoon appointments.

BE SUSPICIOUS OF OROFACIAL PAIN

Pain preceding recurrent head and neck cancer. Wong JS, Wood RE, McLean M. J Orofacial Pain 1998;12:52-59.

Pain is a common finding in almost all types of head and neck cancer. Pain presentation can vary from nonspecific dull or pressing pain, or it may be specific as a sore throat or earache. Recurrence rates for head and neck cancers vary in the literature. Squamous cell carcinoma has been reported to recur from 25 to 66 percent of cases within two years. Reports of pain preceding a clinical diagnosis of recurrent cancer have been documented. The purpose of this study was to examine post-treatment head and neck cancer patients with recurrent malignancy to discern orofacial pain characteristics. Only patients with primary and recurrent oral carcinoma from the patient population of the authors' hospital were considered. Patients with obvious non-malignancy pain sources were not included. Ten of the 12 patients had orofacial pain complaints within seven months following primary tumor treatment. Confirmation of recurrent malignancy in these patients followed the onset of pain by an average of 40 weeks (median 27, range 6 to 173 weeks). None of these patients had identifiable organic pain etiology. Pain was described by 10 of 12 patients as severe. Other reports described pain as shooting, radiating, or stabbing. Trismus was also found to be an accompanying symptom. Eight out of twelve patients had multiple denture adjustments every two to four weeks (totaling between 5 and 16 adjustments) performed in an attempt to relieve supposed denture irritation. **Orofacial pain in post-treatment head and neck cancer patients may precede and herald recurrent malignancy. Those patients who present with orofacial pain without obvious organic etiology should be held in high suspicion and referred appropriately.**

ORAL TRANSMISSION OF HIV-1

The role of the oral environment in HIV-1 transmission. Shugars DC, Wahl SM. J Am Dent Assoc 1998;129:851-858.

The human immunodeficiency virus type 1 (HIV-1) continues to spread at an alarming rate worldwide. In the United States more than 600,000 AIDS cases have been reported to the Centers for Disease Control and Prevention (CDC), with more than 50 percent resulting in AIDS-related deaths. For the dental community, the risk of HIV transmission through oral secretions continues to be a topic of concern. Fortunately the oral cavity is not considered a well-recognized route of transmission, except for postnatal infection via breast-feeding, and possibly oral-genital contact. Epidemiological studies confirm that HIV is poorly transmitted through oral secretions. Multiple mechanisms act to reduce oral transmission of HIV including: the intact mucosal surface, low salivary viral titer levels, minimal CD-4 positive target cells, endogenous salivary antiviral factors, and a newly described saliva-derived inhibitory protein referred to as secretory leukocyte protease inhibitor (SLPI). The authors note though that these antiviral mechanisms do not make the oral cavity impermeable, especially if the oral mucosal surface integrity is compromised. Complete understanding of the endogenous antiviral mechanisms may provide future insight into the development of prophylactic and therapeutic approaches against HIV. **This is an outstanding article summarizing the unique characteristics of the oral cavity in its susceptibility to the various factors thought to influence oral transmission of HIV.**

SIGNIFICANTLY HIGHER BOND STRENGTHS WITH CO-JET SAND

Surface treatment techniques for resin composite repair. Bouschlicher MR, Reinhardt JW, Vargas MA. Am J Dent 1997;10:279-283.

Bonding new composite resin to previously cured composite restorations may be the treatment of choice in treating surface discoloration or repair of small recurrent caries along the margin of a sound restoration. Composite bond strength on uncontaminated oxygen-inhibited surfaces is the same as the cohesive strength of the material. However, contaminated or aged composite repair bond strength is considerably less. The purpose of this study was to compare the bond strengths of fresh composite resin to previously polymerized ("aged") composites following various surface treatments. Eighty specimens were fabricated for both Silux Plus and Pertac Hybrid according to manufacturers' recommendations in a cylindrical split mold. Samples of each composite type were randomly distributed into eight groups of ten to form a total of 16 groups. Two groups of each composite type were treated for four seconds in the following manner: Diamond bur roughening; 50 µm aluminum oxide at 80 psi; KCP-2000 instrument using 27 µm aluminum oxide at 160 psi; and Co-Jet Sand, a tribochemical silica, delivered with a

microetcher at 34 psi. All groups except the Co-Jet Sand groups were etched with 32 percent phosphoric acid. One-half of all groups received silane treatment. A dentin bonding agent was applied with a thin unfilled resin layer placed and polymerized. Corresponding composite resins were used against the treated surfaces and cured for 60 seconds. Samples were stressed to failure in shear on a Zwick Materials Testing Machine. **Results identified that both microfilled and hybrid composite samples treated with Co-Jet Sand had significantly higher bond strengths than all of the other surface treatments. Silane treatment exhibited no benefit with either of the Co-Jet Sand groups.** Silane treatment improved microfill repair bond strength when combined with diamond bur or KCP-2000; diamond bur and microetching treatment improved hybrid composites repair bond strength. Scanning electron microscopic analysis of the Co-Jet Sand groups revealed a roughened surface with abundant particulate Co-Jet Sand material embedded into the composite surface. This study showed that Co-Jet Sand, a new abrasive material, can be utilized for composite repair and does not appear to require silane for bonding to aged composite material.

AIR SYRINGE CAN OVERDRY PRIOR TO DENTIN BONDING

Resin bond strength with different methods to remove excess water from the dentin. DeGoes MF, Pachane GCF, Garcia-Godoy F. Am J Dent 1997;10:298-301.

The need to maintain a "moist" dentin surface for optimal dentin bond strengths has been investigated. Most notably, acetone-based dentin bonding agents require a moist, conditioned dentin surface for higher bond strengths. Residual moisture prevents exposed collagen network collapse, allowing the primer infiltration to "chase" the water out thus allowing resin replacement forming the hybrid layer. The purpose of this study was to compare resin bond strength using different methods of excess water removal while attempting to maintain moist dentin. Sixty non-cariou molars were used with dentin exposed from grinding. In all groups One-Step adhesive system (Bisco) and Z100 composite (3M) were used. After conditioning and rinsing, 40 microliters of distilled water was placed to standardize dentin water content. The specimens were divided into four groups of 15 teeth each. Group one had excess moisture removed with compressed oil-free air from a syringe for three seconds at a distance two centimeters from the dentin surface. Group two was blot-dried with tissue paper. Group three was treated with a dry applicator brush for five seconds. The last group had excess moisture removed with a dry cotton pellet. The dentin remained visibly moist in all procedures. Composite cylinders were then placed, and then thermocycled 500 cycles between 5 and 55 degrees centigrade. Specimens were tested to failure on an Instron Universal testing machine with shear bond strengths calculated. **Results indicate that the bond strengths of the compressed air drying group was statistically lower than the other three groups. There was no statistical bond strength difference among the other methods to remove excess moisture.**

EFFECTIVENESS OF DENTIN BOND/LINER SYSTEMS IN CONJUNCTION WITH SPHERICAL AND ADMIXED HIGH-COPPER AMALGAM ALLOYS

Microleakage of dentin/amalgam alloy bonding agents: Results after 1 year. Meiers JC, Turner EW. Oper Dent, 1998;23:30-35.

Microleakage is a potential problem with new amalgam restorations. Microleakage occurs in the interfacial gap formed between the amalgam and tooth surface. Varnishes traditionally have been utilized, but they can dissolve in oral fluids before high-copper amalgams corrode and fill this gap. The purpose of this study was to evaluate the one-year effectiveness of four dentin bond/viscous liner systems when used with spherical and admixed high-copper amalgam alloys. Sixty non-cariou teeth had standardized Class II preparations placed on mesial and distal surfaces. Each preparation was randomly assigned a restorative material, either Tytin (Sybron/Kerr) or Dispersalloy (Johnson & Johnson). Preparation linings consisted of dentin bonding agent/viscous liner, copal varnish, or no liner. Dentin bonding agents/viscous liners used were Amalgabond Plus (Parkell Products), Tenure (DenMat Corp)/Panavia EX (J Morita), Syntac/Dual Cem (Ivoclar Vivadent), and All-Bond 2/Liner F (Bisco Dental Products). All dentin bonding agents/viscous liners were placed as per manufacturer's instructions. Amalgam was hand-condensed, overfilled, burnished, and carved back into contour. Specimens were stored in 37° C normal saline for one year. The specimens were thermocycled 3000 cycles between five and 55° C with a dwell time of 30 seconds. Microleakage scores were recorded for both enamel and cementum margins. Microleakage scores were compared to short term data (four days) previously

published by the same authors. Results revealed that Amalgabond Plus, Tenure/Panavia EX, and All-Bond 2/Liner F had significantly less microleakage after one year than Syntac/Dual Cem, Copalite, or no liner. The only difference in the one-year group between amalgams was increased Tytin microleakage when combined with copal varnish. Alloy corrosion products did not provide a one-year seal equivalent to that provided from three of the four dentin bond/liner systems. When compared to short-term microleakage data, there was no significant increase in microleakage in these systems when combined with Dispersalloy. However, Tenure/Panavia EX did show a significant increase in microleakage at one year when used with Tytin.

THEY ARE BETTER, BUT YOU STILL HAVE TO BE CAREFUL . . .

Selective interference with pacemaker activity by electrical dental devices. Miller CS, Leonelli FM, Latham E. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1998;85:33-36.

More than a million patients in the United States require cardiac pacemakers, with the number increasing yearly. Safe dental treatment requires electrical interference avoidance that could alter pacemaker function. Newer pacemakers are designed to be more resistant to electrical interference by utilizing titanium shielding and improved filtering circuits. In this study, fourteen dental devices were tested *in vitro* for their ability to interfere with cardiac pacemaker function. Two commonly used cardiac pacemakers (one a dual-chambered, bipolar Thera 7942; the other a single-chamber, unipolar Minix) both manufactured by Medtronic, were evaluated. Pacemakers were programmed for maximum sensitivity and leads were immersed in saline solution concentrated to simulate body tissue resistance so as to produce ECG signals. The dental devices were turned on and off and operated at all power levels against the pacemaker. If interference was noted, the device was moved away from the pacemaker until no interference was noted. **Atrial and ventricular pacing were inhibited by the electrosurgical unit, magnetorestrictive ultrasonic scalers, and the ultrasonic bath cleaner. These equipment items should still be avoided with patients who require pacemakers.**

AVOID APF USE WITH GLASS IONOMER RESTORATIONS

Effect of home-use fluoride gels on resin-modified glass ionomer cements. El-Badrawy WA, McComb D. Oper Dent, 1998,23:2-9.

Acidic-based fluoride gels potentially can degrade both GI and RMGI materials. The purpose of this study was to investigate the dissolution resistance of RMGI and compomers by two home-use fluoride gels. Standardized Class V preparation were prepared on 75 caries-free teeth. These teeth were randomly placed into five groups of 15 teeth. Each group was restored with one of the following materials: Fuji II LC (GC America), Ketac-Fil (ESPE), Photac-Fil (ESPE), Variglass (Caulk), and Vitremer (3M). The restored teeth were further subdivided into three groups of five teeth. One group was stored in distilled water (control). The second group was immersed in neutral 0.5 percent sodium fluoride gel. The last group was treated in 0.5 percent-acidulated phosphate fluoride (APF). Fluoride gel treatment was eight hours daily for 3 days, which equates to one year of home use. The surfaces were then examined with a scanning electron microscope for evidence of surface degradation. Results found that neutral sodium fluoride gel had little effect on the surface integrity of the RMGI. The RMGI demonstrated improved resistance to APF gels over conventional GI, but erosion was still identified. Also, RMGI groups appeared to absorb water and slightly deform when treated with APF. **This study suggests using neutral home fluoride gels with patients who have both GI and RMGI restorations. Also, it might benefit to protect GI and RMGI during in-office APF treatments.**

GENERAL DENTISTRY

55-06 Synopsis of Air Abrasion Units

(Project 98-08)

Air abrasion units are currently enjoying considerable interest. DIS has received an increasing number of inquiries about this technology. Air abrasion works by impacting small alpha alumina particles (27 or 50 micron) at high velocities onto the surface to be abraded. Existing dental clinic compressed air, or if need be a supplemental compressor, supplies the air pressure required to direct the particles through a small nozzle at high velocities. Manufacturer claims include: tooth preparation without local anesthesia, detection of previously undiagnosed caries, conservative removal of incipient caries rather than traditional "watch and recall" philosophy, and improved bonding to not only enamel and dentin but also to porcelain and metals. Disadvantages noted by users include: a lack of tactile sense during preparation, inability to remove soft caries, a steep learning curve, use limited to Class I, IV, and V preparations, patient discomfort at the more efficient higher cutting pressures, and decreased visibility with increased powder debris due to overspray. Some Class II and III preparations are possible but require greater operator expertise. Supplemental evacuation units are helpful in controlling the powder overspray. Face shields are recommended to prevent scratching of operator eyewear, especially magnification loops.

Due to the high air pressures required with air abrasion, particular attention must be taken by the operator in controlling the air/abrasive stream. There is at least one reported case in the literature that describes subcutaneous, orbital, and mediastinal emphysema secondary to use of an air-abrasive device. The use of rubber dam is mandatory when utilizing this technology to reduce the chance of air emphysema.

The literature reports that air abrasion creates cavity preparations that have rounded cavosurface margins and rounded internal line angles. The abraded surface is microscopically rough and the dentinal tubules are occluded, however the smear layer is removed. Histologically, the pulpal changes seen with a highspeed handpiece with water spray are comparable to those seen with air abrasion with either 27 μ or 50 μ particles at 80 psi. A recent study reported that 27 μ particles at 160 psi were the least traumatic to the pulp. Interestingly, higher air pressures are attributed to greater patient discomfort.

Multiple studies have shown that air abrasion does not alleviate the need for normal acid etching and bonding procedures. Composite bond strengths to enamel and dentin are significantly less when air abrasion alone is compared to acid etching. Similarly, microleakage is significantly increased when air abrasion alone is compared to acid etching. Most studies have found that bond strengths to enamel and dentin are independent of particle size and air pressure, but at least one study has demonstrated the best overall bond strengths to several restorative materials including composite, titanium, amalgam, gold, and porcelain were obtained with 50 μ particles at 120 psi.

This synopsis (Attachment 1) will enable readers to compare such variables as price, standard accessories, appearance, controls, particle size selection, air pressure range, availability of adjunctive suction, and other pertinent features in one single format.

(Col Leonard)

55-07 Orthopantomograph OP 100

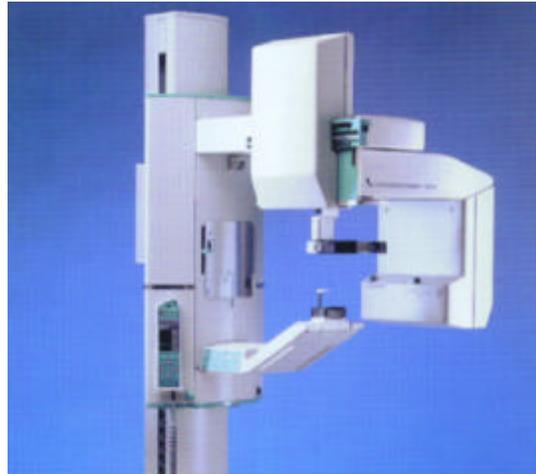
(Project 97-24)

The Orthopantomograph OP 100 is an advanced dental imaging panoramic machine that is fully computer controlled. This unit has Automatic Exposure Control (AEC), Automatic Spine Compensation (ASC), a patented V-shaped X-ray beam (focal spot is 0.5 millimeters), and a built-in Quality Assurance

(QA) program. The OP 100 is available with many options including: cephalometrics (OC 100), linear tomography (Ortho Trans), identification film marking (Ortho ID), special imaging software (Ortho Zone and Ortho TMJ), and digital capability. The OP 100 is available in both 110/220 volts, 50/60 hertz and is a direct current system. This machine conforms to standard ISO 9001, and is Good Manufacturing Practice/FDA cleared, UL listed, and IEC 601-1 compliant. It requires a minimum ceiling height of 92 inches and floor space of 50 inches by 36 inches. The unit weighs 450 pounds.

Manufacturer:

Instrumentarium Imaging, Inc.
300 West Edgerton Avenue
Milwaukee, WI 53207
(800) 558-6120
(414) 747-1030
(414) 481-8665 FAX



Suggested Retail Price:

OP 100	\$26,200.00
OC 100	\$33,900.00
Ortho Trans	\$36,100.00
Ortho Zone	\$750.00
Ortho TMJ	\$750.00
Ortho ID	\$1,800.00

Government Price:

OP 100	\$18,340.00
OC 100	\$23,730.00
Ortho Trans	\$25,270.00
Ortho Zone	\$525.00
Ortho TMJ	\$525.00
Ortho ID	\$1,260.00

ADVANTAGES:

- + Computer-controlled radiation provides best image with lowest exposure.
- + Patented Automatic Exposure Control produces consistent image quality.
- + Patented V beam corrects for differences in skull anatomy resulting in higher resolution.
- + Easy to understand control panel.
- + Open design facilitates accessibility.
- + Unique-positioning system decreases common operator positioning errors.
- + Small focal spot delivers high definition.
- + Easy to use tomography system eliminates the need for a separate dedicated system.
- + Cost-competitive tomography; most cost-efficient way to assess bone quality for implants.
- + Flexible system with many options.
- + Easy to add digital radiography components.
- + Laminated checklist.
- + Conforms to ISO standard 9001.
- + GMP/FDA cleared; UL listed; IEC 601-1 compliant.

DISADVANTAGES:

- Potential for tubehead to contact back of patient's head during tomographic imaging if patient is positioned incorrectly (contact may startle patient).

SUMMARY AND CONCLUSIONS:

The Orthopantomograph OP 100 is a versatile, user-friendly dental panoramic unit with the potential for multiple upgrades. It is the only system with Automatic Exposure Control, and has an extremely small

focal spot producing consistent image quality with higher density, resolution, and contrast. The basic unit is appropriate for any size clinic and can be retrofitted at a future date for cephalometrics, linear tomography, or digital imaging. The OP 100 was evaluated by the USAF Advisor in Maxillofacial Radiology and found to be extremely easy to use, producing consistent high quality films. The **Orthopantomograph OP 100** is rated **Recommended** for use by the federal dental services.

(Col Bartoloni)

55-08 Suprasson P-Max Ultrasonic Scaler

(Project 97-08)

The Suprasson P-Max (piezoelectric) Ultrasonic Scaler has been designed by its manufacturer for scaling, endodontic, and periodontal treatment. It is equipped to deliver both dental unit water and sterile water/solutions for irrigation. The metal-bodied unit is compact and features a detachable handpiece constructed of autoclavable plastic, titanium, and steel. The P-Max allows for sterile irrigation via an external pump and disposable irrigation lines. The irrigation line is fed from a sterile source and is routed through the Steripump on the back of the unit. The Steripump is a cassette-style peristaltic pump that provides full flow rate control and unidirectional flow of irrigation fluids. From the pump, the irrigation line travels externally to the Sterijoint, which is a connector located between the detachable handpiece and handpiece cord. This autoclavable piece ensures the sterility of the solution delivered through the handpiece to the patient's mouth. Dental unit water is fed through the rear of the ultrasonic unit and is transported within the handpiece hose for scaling when sterile water is not required. Because the P-Max is indicated for scaling, endodontic, and periodontic use, there are a variety of specialized tips available for each application. The tips screw onto the handpiece and moderately tightened with a corresponding wrench that is supplied with the unit. The control panel features an on/off switch, power adjustment knob, pump/stop/solenoid selector switch with indicator, spray adjustment knob, and range selection membrane touch pad with lighted indicators. A dual-switch foot control is used to provide three functions. The right switch triggers the ultrasonic action of the unit. The left switch activates the maximum pump flow that is set from the control panel. Simultaneous action of both switches yields both ultrasonic action and irrigation. The unit measures 2.8 inches high by 10 inches long by 6.64 inches wide and has a shipping weight of 9.5 pounds. The Suprasson P-Max Ultrasonic Scaler is configured for 85 to 264 volts, 50/60 Hz, and is CE marked.

Manufacturer:

SATELEC
ZI du Phare
Avenue Gustave Eiffel
Merignac-Cedex
France
(33) 56 34 06 07
(33) 56 47 85 52 FAX

Source:

American Medical and Dental Corporation
1236 Brace Rd, Unit B
Cherry Hill, NJ 08034
(609) 429-8297
(609) 429-2953 FAX

Suggested Retail Price:

\$2,399.00 Includes dual switch foot control, three irrigation lines and rubber stoppers, detachable power cord, glass irrigation bottle with holder, support bracket and hanger for irrigation bottle, Sterijoint, autoclavable handpiece, S1 or S10 tip, and universal tip wrench.



Government Price:

\$1,999.00 Same as above.

ADVANTAGES:

- + Delivers dental unit or sterile water.
- + Lightweight, portable unit.
- + Features three modes; endodontic, periodontal, and prophylaxis.
- + Easy to clean and disinfect.
- + Autoclavable handpiece.
- + Uses disposable tubing for sterile delivery, eliminating possible waterline contamination.
- + Touch pad sealed for ease of disinfection.
- + Five-year warranty on unit, two-years on autoclavable handpiece.
- + CE marked, IEC 601 electrical certification.

DISADVANTAGES:

- Foot control is not sealed from liquids.
- Unit (as provided) did not meet AFI 44-201 and 44-203 (NFPA 99-7, UL 544, IEC 601) electrical safety standards for ground resistance and case leakage for electrical items in patient care areas.
- Operation, installation, and maintenance manuals lacked detailed schematics and were difficult to follow.
- Unit not hardwired and lacks a hospital-grade safety plug.
- Found by evaluators to be unsuitable for periodontal use due to a lack of power.
- Unit is priced higher than other ultrasonic units.

SUMMARY AND CONCLUSIONS:

The Suprasson P-Max Ultrasonic Scaler is purported to be well suited for periodontal, endodontic, and prophylaxis treatment, but failed to meet a number of military specifications for medical equipment. The delivery of sterile irrigating solution to the working field was found to be the primary benefit of this unit. Endodontic providers liked the P-Max because of its light weight, portability, and overall effectiveness. The clinical evaluators also found the unit easy to clean and maintain. All of the endodontic clinical evaluators rated the P-Max as "Excellent." Periodontal evaluators disliked the scaler because of a lack of power, and rated the P-Max as "Poor" and "Unsatisfactory." Changing of ultrasonic tips and files was determined to be labor intensive by both groups, especially during patient treatment. The evaluation unit tested by DIS did not meet AFI 44-201 and 44-203 (NFPA 99-7, UL 544, IEC 601) electrical safety standards for ground resistance and case leakage for use in patient care areas. In addition, it lacked a suitable hospital-grade safety plug. DIS received written correspondence from the manufacturer prior to the publication of this report that all discrepancies have been corrected concerning the electrical safety standards. The manufacturer claims additional changes to the manufacturing process and guarantees that all government orders will come with a sealed foot control and hospital-grade safety plug. However, DIS has not confirmed the changes with in-house testing. The **Suprasson P-Max Ultrasonic Scaler**, as provided to DIS for evaluation, is rated **Marginal** for use by the federal dental services.

(SSgt Martin, Mr Gambal)

55-09 Cavitron SPS Ultrasonic Scaler**(Project 97-27)**

The Cavitron Sustained Performance System (SPS) is a new magnetorestrictive scaler from Dentsply/Cavitron that is purported to offer a balance between scaling efficiency and patient comfort.

Dentsply claims that the balance is maintained through increased scaling effectiveness at lower power settings. The scaler also features “The Blue Zone”, an extended lower power range for subgingival scaling that provides a temporary power boost. The unit is also available with a Cavitron Jet air polishing system (Cavitron Jet with SPS Technology) which incorporates both the SPS scaler and a sodium bicarbonate jet abrasive polishing system. The Cavitron SPS scaler comes with one 30k insert, one Steri-Mate detachable sterilizable handpiece, and a corded foot pedal. The Cavitron SPS measures 4 inches high by 9.5 inches long by 7.3 inches wide and weighs 12 pounds. The scaler is configured for 115 volts and is UL listed and CE marked.



As an option, the unit can be equipped with the DualSelect Dispensing System for the delivery of medicaments or clean water through ultrasonic systems. The DualSelect comes with two 500-mL dispensing bottles and features a selection knob to choose the desired bottle. This dispensing system uses a closed water line to utilize clean fluids from the dispenser bottles. An infection control protocol is provided by the manufacturer that specifies how to maintain the integrity of the system. The DualSelect Dispensing System measures 10.25 inches high by 9 inches long by 8 inches wide and weighs 4.2 pounds.

Manufacturer:

Dentsply/Cavitron
 PO Box 7807
 York, PA 17404-0807
 (800) 347-7412
 (717) 767-8501
 (717) 767-8266 FAX

VA Contract # V797P-3095K

Suggested Retail Price:

- \$1,525.00 Cavitron SPS scaler (Item #80560) with 30k insert, Steri-Mate detachable sterilizable handpiece, corded foot pedal, and instructions.
- \$3,495.00 Cavitron Jet with SPS Technology (Item #80656) with 30k insert, air polishing nozzle, four packets Prophy Jet cleaning powder, corded foot pedal, and instructions.
- \$395.00 DualSelect Dispensing System (Item #80528)
- \$61.55 DualSelect Accessory Pack (Item #80529)
- \$30.80 DualSelect Disinfectant Bottle (Item #80530)

Government Price:

- \$976.36 Cavitron SPS scaler (Item #80560, same contents as above).
- \$2,283.11 Cavitron Jet with SPS Technology (Item #80656, same contents as above).
- \$225.97 DualSelect Dispensing System (Item #80528)
- \$40.20 DualSelect Accessory Pack (Item #80529)
- \$20.10 DualSelect Disinfectant Bottle (Item #80530)

ADVANTAGES:

- + Is easy to use.
- + Provides excellent calculus removal.

- + Comfortable for sensitive patients.
- + Autoclavable handpiece.
- + Optional DualSelect provides separate water system for scaler.
- + Attractive design and smooth finish facilitates asepsis.
- + Power adjustment controls well placed.
- + Features laminated quick-reference cards for infection control protocol and insert efficiency indicators.
- + Complete and clear operating, installation, and maintenance instructions.
- + Meets all electrical safety standards as outlined in AFI 41-201 and 41-203.
- + Is UL listed and CE marked.
- + Full 2-year warranty on parts (Cavitron SPS), Full 1-year warranty on parts (DualSelect).

DISADVANTAGES:

- Placement of on/off switch is less than ideal.
- Evaluators noted that moving both the cavitron and dispensing system together may be awkward when connected for patient care.
- Unit shield on DualSelect may close abruptly, resulting in minor injury to fingers during bottle placement or removal.

SUMMARY AND CONCLUSIONS:

The Cavitron SPS is a magnetorestrictive scaler that is easy to use for dental prophylaxis procedures. The simple, modern design of the unit facilitates established infection control procedures such as disinfection and barrier protection. Operating, installation, and maintenance instructions were complete and easy to follow. Providers liked the placement of the power adjustment controls and the ease of the foot control operation. Evaluators judged the location of the on/off switch (located on the underside of the unit) to be less than ideal. Laboratory evaluators found that the unit shield on the DualSelect may close abruptly, resulting in minor injury to fingers holding the unit base during bottle placement or removal and recommend a caution statement be placed in the operator’s manual. The Cavitron SPS met all electrical safety standards of AFI 41-201 and 41-203. All nine clinical evaluators rated the Cavitron SPS and DualSelect Dispensing System as “Good” or “Excellent.” The **Cavitron SPS Ultrasonic Scaler** is rated **Recommended** for use by the federal dental services.

(SSgt Martin)

55-10 Hilux 350 Curing Light

(Project 97-34)

The Hilux 350 is a hand-held, corded, visible light polymerization system consisting of a pistol-style handpiece attached via a 5.5-foot cord to the power unit. The power unit contains a built-in “digital” intensity meter and the master on/off control. The activation (on/off) control and exposure time selection switches are conveniently located on the handpiece. Curing time can be set between 10 and 90 seconds in 10-second increments or placed in the manual or continuous mode. The handpiece comes standard with a 75-Watt quartz-halogen bulb and an 11-mm curved curing wand. Various sized curing wands (3-mm, 8-mm, and 13-mm) are available optional items. The cooling fan operation is temperature dependent to minimize unnecessary fan operation and noise. The curing light is available in both 120 V and 240 V models. UL listing is pending.



Manufacturer:

First Medica, Inc.
3704-C Boren Drive
Greensboro NC 27407
(800) 777-7072
(910) 292-1322
(910) 292-1322 FAX

Suggested Retail Price:

\$690.00 Includes: Hilux 350, 75-watt quartz-halogen bulb, 11-mm diameter curved fiberoptic light guide, integrated light meter and eye protection shield.

Government Price:

\$435.00 Includes same as above.

ADVANTAGES:

- + Built-in radiometer.
- + High irradiance with 8-mm light guide (655 mW/cm²).
- + Small compact unit.
- + Sterilizable curing wands.
- + 360-degree-swiveling curing light guides.
- + Cooling fan operation is proportional to bulb usage.
- + Ergonomically-placed on/off activation and timer switches.
- + Easily cleaned or barrier protected.
- + Accepts Demetron light guides.

DISADVANTAGES:

- Minimally adequate irradiance with standard 11-mm light guide (386 mW/cm²).
- Minimally adequate irradiance with optional 13-mm light guide (380 mW/cm²).
- Built-in radiometer is inaccurate unless an 8-mm light guide is used.
- No voltage regulator.
- Handpiece becomes noticeably hot with extended curing times.
- No electrical safety certifications (UL listing pending).

SUMMARY AND CONCLUSIONS:

The Hilux 350 curing light is a compact, easy-to-use, light-weight unit that is easily positioned to reach all areas of the oral cavity. The unit produces high irradiance when combined with an optional 8-mm light guide (655 mW/cm²), but is marginally acceptable with the standard 11-mm (386 mW/cm²) and optional 13-mm guide (380 mW/cm²). Any loss in irradiance due to filter or light guide degradation would reduce the available irradiance below the textbook minimum of 300 mW/cm² required to adequately polymerize light-activated materials. The built-in digital radiometer is accurate within $\pm 5\%$ with an optional 8-mm light guide but overestimates the actual irradiance by 40% with the standard 11-mm guide. The light guides can be either autoclaved or cold-sterilized. Autoclaving the light guide for fifteen sterilization cycles caused neither loss of light intensity nor any deleterious effects on the physical integrity of the light guide. Clinical evaluators appreciated the quiet cooling fan that runs in proportion to the length of time the light is activated. All control switches are conveniently located on the handpiece and are easy to disinfect or barrier protect. All clinical evaluators rated the Hilux 350 as either "Excellent" or "Good", however the lack of an internal voltage regulator would result in reduced irradiance in clinics that experience periodic line voltage fluctuations. DIS testing found that a 10-volt drop from the nominal 120 volts resulted in a 30% decrease in irradiance (down to 272 mW/cm²) with the standard 11-mm light guide. According to ANSI Standard C84.1-1995, line voltages are allowed to fluctuate between 110 volts and 126 volts for nominal 120-volt service. Electrical equipment is required to function within this range without a reduction in performance. The Hilux 350 with its standard 11-mm light guide fails to maintain adequate irradiance at the lower end of this range such that inadequate composite polymerization could occur. If the manufacturer had supplied an 8-mm light guide as standard then irradiance levels would

have been adequate at 110 volts even without a voltage regulator. **The Hilux 350** is rated **Marginal** for use by the federal dental services.

(Col Leonard)

55-11 Synopsis of Resin Cements

(Project 97-33)

Resin cements are indicated for permanent cementation of cast ceramic, full porcelain, porcelain veneer, and indirect composite resin restorations. Resin cements are also the choice luting agent for resin-bonded fixed partial dentures (e.g. "Maryland" bridges). Resin cements provide high compressive strength and low solubility required for these types of restorations. Resin cements have relative indications for cast restorations with less than optimal resistance/retention features and may also be considered in certain situations for post cementation.

Resin cements can be categorized by their polymerization method. Based on this method, there are three categories: Visible-light activated, self-activated, and dual-activated. Visible-light activated resin cements are utilized in luting cast ceramic, full porcelain, and veneer restorations that are thin or translucent to permit visible light penetration and thus polymerize the cement. These light-activated cements may be radiolucent and are usually provided in various shades since they are utilized in esthetically demanding situations. Self-activated resin cements are used for resin-bonded fixed partial dentures and cast ceramic, porcelain, and composite resin restorations where light is unable to penetrate. Self-activated resin cements are usually only available in one or limited shades. Finally, dual-activated cements purport to contain both light-activation and self-cure systems that polymerize the cement where light penetration may occur only to a limited degree. Current resin luting systems tend to include more esthetic dual-cured systems with the addition of chemical catalysts in an attempt to market systems that include both dual- and self-cure capabilities.

Information clinicians may need to assist in purchasing a resin luting system has been provided in Attachment 2. Information requests were sent to all known resin cement manufacturers. What appears in this synopsis is information from companies that responded to the request for information. Blanks will be found where information was not provided or deemed non-applicable by the manufacturer.

(Lt Col Roberts)

55-12 Fuji IX GP Glass Ionomer

(Project 97-23)

Fuji IX GP is GC America's latest glass ionomer restorative material. Fuji IX is a member of the newest class of self-cure glass ionomer restorative materials that has been categorized as "densified", "condensible", or "viscous" by various authors. Fuji IX GP was developed by GC International as the restorative material for the World Health Organization's Atraumatic Restorative Treatment (ART) technique. The ART technique involves caries removal and tooth restoration with adhesive restorative materials using only hand instrumentation. This restorative service is usually performed by auxiliary personnel who have limited experience in dental procedures and often provided under primitive field conditions.

Although GC International considers exact particle size information proprietary, Fuji IX GP has a smaller mean particle size than earlier self-cure glass ionomer restorative materials. This smaller particle size is purported to give improved wear rates and faster setting time than earlier glass ionomer materials. Fuji IX GP powder is composed of 95 percent by weight alumino-fluoro-silicate glass with 5 percent polyacrylic acid powder. Fuji IX GP liquid is composed of 50 percent distilled water, 40 percent polyacrylic acid, and 10 percent polybasic carboxylic acid. Fuji IX GP is prepared with a powder/liquid ratio of 3.6/1.0 and should be mixed in 25 to 30 seconds. Fuji IX GP has a stated two-minute working

time with a net setting time of two minutes and twenty seconds. GC America states that final finishing and polishing may be initiated six minutes from the start of mixing the material. The material should be protected with either Fuji Varnish or Fuji Coat LC during initial setting and after final finishing to prevent material degradation from corresponding moisture contamination or desiccation. GC America states that Fuji IX is a condensible (similar to amalgam) general-purpose posterior glass ionomer. Also, this restorative material is promoted as possessing excellent clinical handling characteristics. Fuji IX's purported uses include: Amalgam/Composite/Compomer alternative for pediatric and geriatric patients; intermediate restorative; long-term provisional restorations for posterior teeth; final restoration for non-stress bearing areas; and core build-up and sandwich material. Fuji IX GP's purported advantages over current glass ionomer materials are decreased moisture sensitivity, improved wear characteristics, and no requirement for a visible light curing unit (if Fuji Varnish is used).

Fuji IX GP is available in both powder/liquid and precapsulated delivery systems. For the purpose of this evaluation, DIS evaluated the powder/liquid delivery system to evaluate this material's suitability as a military contingency interim or temporary restorative material. Intermediate Restorative Material (IRM) has traditionally been used as a temporary restorative material in dentistry. Although its use has diminished in recent years because of the advent of glass-ionomer cements, it remains an important component of readiness dental kits. Unfortunately, IRM has some significant limitations as a temporary restorative material including sensitivity to humidity and temperature, poor long-term sealing, lack of adhesion to tooth structure, and challenging handling characteristics. A more user-friendly readiness provisional material that has better performance features than IRM would be welcomed by military dentistry.

Manufacturer:

GC America Inc
3737 West 127th Street
Alsip, IL 60803
(800) 323-3386
(708) 597-0900
(708) 371-5148 FAX

Suggested Retail Price:

\$80.00 Fuji IX GP Standard 1:1 Package (product number 439101) contains:
15 gm powder (A2)
8 gm liquid
Mixing pad
Plastic spatula
Instructions

Government Price:

\$31.20 Product number 439101, contents same as above.

ADVANTAGES:

- + Easy to integrate into existing clinical technique.
- + Viscosity/consistency can be tailored to meet clinical requirements.
- + Only glass ionomer restorative material in its class that is available in non-encapsulated form.
- + Does not require visible light curing unit.
- + Simple, straight-forward, compact packaging.
- + Faster clinical set than conventional auto-cure glass ionomer restorative materials.
- + Possesses sufficient radiopacity.
- + Provides adhesion to tooth structure.
- + Instructions are clear and easy to understand.
- + Majority of users could condense material without difficulty.
- + Available in precapsulated delivery system.
- + Evaluators found it to be "as easy" or "easier" to finish as other glass ionomer materials.
- + Proven clinical performance in World Health Organization Atraumatic Restorative Technique.

+ Varnish tolerated well by patients.

DISADVANTAGES:

- May stick to instruments.
- Requires a varnish (or VLC glaze) for definitive restorations.

SUMMARY AND CONCLUSIONS:

Fuji IX GP was well received by the clinical evaluators. Users liked the simple, compact packaging and found that the instructions were easy to follow. The clinical evaluators found Fuji IX GP easy to integrate into their existing clinical practice and were impressed with the material's apparent physical properties, finding Fuji IX GP to be a clinically dense and tough material. Fuji IX GP afforded excellent retention when used as a provisional, and all of the evaluators found it to be as easy or easier to finish than other glass ionomers that they were familiar with. Overall, users appreciated Fuji IX GP's clinical handling characteristics, and the majority could condense it without difficulty. Fuji IX GP is radiopaque, adheres to tooth structure and is a member of a class of materials that exhibits chemical adhesion and fluoride release and recharge. It is the only glass ionomer restorative material in its class that is available as a non-encapsulated form (preencapsulated is also available) and does not require a visible light curing unit. Fuji IX GP has shown excellent clinical results in the World Health Organization Atraumatic Restorative Technique program. Fuji IX GP is rated **Acceptable** for a general-purpose glass ionomer restorative material. Fuji IX GP is **Recommended** as the default provisional restoration material replacing IRM in military contingency operations.

(Lt Col Roberts)

55-13 Synopsis of Dental X-ray Chairs

(Project 97-44)

Attachment 3 is an informational synopsis on dental X-ray chairs currently available from four companies. There are very few factors to consider when shopping for a dental X-ray chair; the buyer must determine whether they require an electric, hydraulic, or manual chair. Although most of the features provided by the companies are similar, the price does vary.

This synopsis includes only the manufacturers that replied to our request for information. Two of the companies listed have VA contracts: Boyd Industries (V797P-3019K) and Reliance (V797-3472J). None currently have a National Stock Number (NSN). The information provided should reduce the amount of time and effort required by logistics personnel when purchasing dental X-ray chairs.

Prior to ordering dental X-ray chairs, be sure to contact the company to confirm the information provided in Attachment 3. Please contact DIS if you have any thoughts, questions, or comments concerning dental X-ray chairs.

(SSgt Pena)

55-14 Comparison of Nine Commercially-Available Fiberoptic High-Speed Handpieces

A dependable and efficient high-speed handpiece is required to provide consistent and quality dentistry. Heat sterilization of dental handpieces has increased the incidence of handpiece failures and repairs. Turbine failure, poor performance, loss of fiberoptic intensity, need for greater inventory, and overall increased frequency of repair are major complaints. DIS constantly receives inquiries as to which high-speed handpiece to purchase. DIS recently completed an extensive two-year laboratory evaluation of nine popular commercially-available high-speed handpieces.

Ten parameters related to clinical performance were evaluated. Longevity, power, speed (in revolutions per minute), fiberoptic transmission, eccentricity, noise level, and adequacy of the chucking mechanism were determined at baseline and at subsequent 250 simulated clinical use intervals until the test handpieces either failed or reached 1,000 uses. Static parameters including handpiece visibility angle, interocclusal clearance, and water coolant spray pattern were determined at baseline (new handpieces) only.

In order to clarify and organize the data obtained from this study, a summary table (see below) is provided that compares the performance of each handpiece model in nine different categories. Each model was rated either (+) positive, (0) neutral, or (-) negative for each category. DIS assigned levels of importance for each performance parameter. This relative weighting is listed in the table below the category name and enclosed in brackets []. The (+), (-), and (0) were compiled for each handpiece model and the cumulative total used to rank overall performance. The DIS ratings of recommended, acceptable, or marginal found in the following nine individual handpiece reports were based on this summary table.

(Col Leonard)

Group	Longevity [3]	Fiber optics [2]	Power [1]	Noise [1]	Eccen [1]	Chuck [1]	Vis Angle [1/2]	Access [1/2]	Price [1]	Total Score
Star 430 SWL	+	+	0	+	+	+	0	0	0	+8.0
Kavo 640B	+	+	+	0	+	+	-	0	0	+7.5
Kavo 642B	+	+	-	0	+	+	+	+	0	+7.0
Midwest Quiet-Air	+	+	-	-	0	+	+	-	0	+4.0
W&H 898	+	-	+	+	+	+	-	-	0	+4.0
W&H 896	+	-	-	+	+	+	+	-	0	+3.0
Lares 757	-	+	+	-	0	-	-	+	+	-1.0
Midwest Tradition	0	-	0	-	0	+	0	0	0	-2.0
Lares 557	-	-	0	0	0	-	+	+	+	-4.0

55-15 KaVo 640B High-Speed Fiberoptic Handpiece

(Project 96-48)

The KaVo 640B fiberoptic high-speed handpiece has a large turbine head with triple spray cooling. It is designed for use in practices with a significant amount of heavy cutting. The 640B is connected to the dental unit handpiece hose by either the KaVo Multiflex Lux 465 LRN or the Kavo Multiflex Lux 1390 Coupler. Both couplers provide easy handpiece interchangeability, anti-retraction valves and 360-degree swivel. In addition, the Multiflex Lux 465 LRN Coupler contains the fiberoptic bulb and water spray adjustment. The Kavo Multiflex Lux 1390 Coupler allows connection of the handpiece to 5-hole fiberoptic handpiece hoses that provide the fiberoptic light with a bulb at the end of the hose or from a remote source. The handpiece has a push-button auto-chuck and can be heat sterilized in either an autoclave or chemiclave. The free running speed is reported to be 350,000 RPM @ 33 psi which was confirmed by DIS testing. The handpiece contains an automatic air regulator valve to sense line air pressure and automatically reduces the air pressure to the correct 33 psi. This allows all handpiece hose pressures to be set at the higher air pressures required for slow-speed handpieces without damaging the high-speed handpiece. The turbine is field replaceable to reduce handpiece down time but Kavo recommends returning the handpiece to them for servicing. The KaVo 640B handpiece (including

coupler) measures 14 cm in length and weighs 2.9 ounces. The handpiece head diameter and length measure 12.5 mm and 15.1 mm respectively. The distance from the back of the handpiece to the tip of a standard 19 mm bur (interocclusal clearance) is 22.7 mm. The handpiece is warranted against defects in materials and workmanship for six months.

Manufacturer:

KaVo America
340 East Main Street
Lake Zurich, IL 60047
(800) 323-8029
(847) 550-6800
(847) 550-6825 FAX



Suggested Retail Prices:

640B High-Speed Handpiece	\$875.00
Replacement Turbine Cartridge	\$300.00
Multiflex Lux 465 LRN Coupler	\$245.00
Multiflex Lux 1390 Coupler	\$205.00

Government Prices:

640B High-Speed Handpiece	\$399.00
Replacement Turbine Cartridge	\$167.30
Multiflex Lux 465 LRN Coupler	\$147.00
Multiflex Lux 1390 Coupler	\$98.00

ADVANTAGES:

- + 83% of test handpieces were operating at 1000 simulated clinical use/sterilizations.
- + Highest power (15 watts) of any model evaluated.
- + Automatic air pressure regulator.
- + 360-degree swivel coupler.
- + Excellent concentricity.
- + Push-button bur release.
- + Turbine is field replaceable.
- + Requires lubrication before sterilization only.

DISADVANTAGES:

- Coupler easily damaged if dropped or misused.
- Cellular fiberoptics can break if dropped.
- Large head diameter reduces visibility.

SUMMARY AND CONCLUSIONS:

The KaVo 640B highspeed handpiece performed much better than average for most of the parameters evaluated and performed the best in concentricity and power. The 640B maintained only 58% of its fiberoptic intensity over 1000 simulated clinical use/sterilization cycles, but significantly improved to 81% after the fiberoptic lenses were polished. The noise level of the 640B was measured at 72 decibels. The noise level of all handpieces evaluated ranged from 69 decibels to 77 decibels. One hundred percent of the test handpieces functioned over 750 uses and 83% were functioning after 1000 cycles. **The KaVo 640B** is rated **Recommended** for use by the federal dental services.

(Lt Col Leonard, Mr Gambal, SSgt Pena, DT1 McMillan, SSgt Martin)

55-16 KaVo 642B High-Speed Fiberoptic Handpiece

(Project 96-49)

The KaVo 642B fiberoptic high-speed handpiece features a compact turbine head and is designed for use in a wide range of dental restorative procedures. The 642B is connected to the dental unit handpiece hose by either the KaVo Multiflex Lux 465 LRN or the KaVo Multiflex Lux 1390 Coupler. Both couplers provide easy handpiece interchangeability, anti-retraction valves and 360-degree swivel. In addition, the Multiflex Lux 465 LRN Coupler contains the fiberoptic bulb and water spray adjustment. The KaVo Multiflex Lux 1390 Coupler allows connection of the handpiece to 5-hole fiberoptic handpiece hoses that provide the fiberoptic light with a bulb at the end of the hose or from a remote source. The handpiece has a push-button auto-chuck and can be heat sterilized in either an autoclave or chemiclave. The free running speed is reported to be 410,000 RPM @ 33 psi which was confirmed by DIS testing. The handpiece contains an automatic air regulator valve to sense line air pressure and automatically reduces the air pressure to the correct 33 psi. This allows all handpiece hose pressures to be set at the higher air pressures required for slow-speed handpieces without damaging the high-speed handpiece. The turbine is field replaceable to reduce handpiece down time but KaVo recommends returning the handpiece to them for servicing. The KaVo 642B handpiece (including coupler) measures 14 cm in length and weighs 2.8 ounces. The handpiece head diameter and length measure 11 mm and 13.2 mm respectively. The distance from the back of the handpiece to the tip of a standard 19 mm bur (interocclusal clearance) is 21.75 mm. The handpiece is warranted against defects in materials and workmanship for six months.

Manufacturer:

KaVo America
340 East Main Street
Lake Zurich, IL 60047
(800) 323-8029
(847) 550-6800
(847) 550-6825 FAX



Suggested Retail Prices:

642B Highspeed Handpiece	\$875.00
Replacement Turbine Cartridge	\$300.00
Multiflex Lux 465 LRN Coupler	\$245.00
Multiflex Lux 1390 Coupler	\$205.00

Government Prices:

642B Highspeed Handpiece	\$399.00
Replacement Turbine Cartridge	\$167.30
Multiflex Lux 465 LRN Coupler	\$147.00
Multiflex Lux 1390 Coupler	\$98.00

ADVANTAGES:

- + 66.6% of test handpieces were operating at 1000 simulated clinical use/sterilizations.
- + Adequate power (11.1 watts).
- + Maintained 75% of fiberoptic intensity after 1000 simulated clinical use/sterilizations.
- + Automatic air pressure regulator.
- + 360-degree swivel coupler.
- + Excellent concentricity.
- + Push-button bur release.
- + Excellent visibility and interocclusal clearance.
- + Turbine is field replaceable.
- + Requires lubrication before sterilization only.

DISADVANTAGES:

- Coupler easily damaged if dropped or misused.
- Cellular fiberoptics can break if dropped.

SUMMARY AND CONCLUSIONS:

The KaVo 642B fiberoptic high-speed handpiece performed much better than average for most parameters evaluated. Its power (11.5 watts) was in the lower third of all models evaluated, but was well over the 5 watts required to be clinically acceptable. The 642B maintained 75% of it's fiberoptic intensity after 1000 simulated clinical use/sterilization cycles, but significantly improved to 93% after the fiberoptic lenses were polished. The noise level of the 642B was measured at 75 decibels. The noise level of all handpieces evaluated ranged from 69 decibels to 77 decibels. One hundred percent of the KaVo 642B test handpieces functioned over 750 uses and 66.6% were functioning after 1000 cycles. The compact head increases operator visibility and interocclusal access. **The KaVo 642B** is rated **Recommended** for use by the federal dental services.

(Lt Col Leonard, Mr Gambal, SSgt Pena, DT1 McMillan, SSgt Martin)

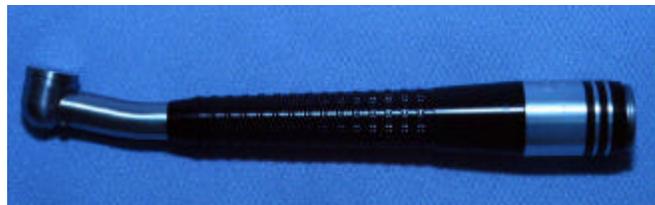
55-17 Lares 557 Turbo High-Speed Handpiece

(Project 96-54)

The Lares 557 Turbo fiberoptic high-speed handpiece is a lightweight compact handpiece. It has one of the smallest heads on the market and has the smallest head of any handpiece evaluated by DIS. The handpiece can be heat sterilized in either an autoclave or chemiclave. The free running speed is reported to be 450,000 RPM @ 32 psi. DIS testing found the handpiece to operate at 423,000 RPM @ 32 psi. Both the push-button chuck and turbine are field replaceable and easily accomplished. The handpiece is connected to the dental unit handpiece hose by either the Lares Euro-Style (ISO-C) Apollo Coupler or the Lares Integral Swivel Fiberoptic Coupler. Both couplers provide easy handpiece interchangeability and 360-degree swivel. The handpiece (coupler included) measures 14.4 cm and weighs 1.5 ounces. The handpiece head diameter and length measure 10.2 mm and 10.88 mm respectively. The distance from the back of the handpiece to the tip of a standard 19 mm bur (interocclusal clearance) is 21.5 mm. The handpiece is warranted against defects in materials and workmanship for one year excluding the chuck, which is warranted for 90 days.

Manufacturer:

Lares Research
 295 Lockheed Avenue
 Chico, CA 95926
 (800) 347-3289
 (916) 345--1767
 (916) 345-1870 FAX



Suggested Retail Prices:

557+ Turbo Fiberoptic Handpiece	\$419.00
Integral Fiberoptic Swivel Coupler	\$124.00
557+ Turbo Handpiece w/ Swivel Coupler	\$469.00
Replacement Turbine Cartridge	\$174.00

Government Prices:

557+ Turbo Fiberoptic Handpiece	\$303.20
Integral Fiberoptic Swivel Coupler	\$86.40
557+ Turbo Handpiece w/ Swivel Coupler	\$343.20
Replacement Turbine Cartridge	\$127.20

ADVANTAGES:

- + Less expensive.
- + Better than average power (13.1 watts).
- + Turbine cartridge is field replaceable.
- + Chuck is field replaceable independent of turbine.
- + 360-degree swivel coupler.
- + Best visibility and interocclusal clearance of all models evaluated.
- + Push-button bur release.
- + Turbine warranted for one year.

DISADVANTAGES:

- 100% of test handpieces failed between 500 and 750 simulated clinical use/sterilizations.
- Fiberoptics degraded 58% after 1,000 simulated clinical use/sterilizations.
- Push-button chuck proved difficult to use.
- Requires lubrication before and after sterilization.
- Chuck warranted for only 90 days.

SUMMARY AND CONCLUSIONS:

The Lares 557 fiberoptic high-speed handpiece is the least expensive handpiece of the models evaluated. Its power (13.1 watts) was in the middle third of all models evaluated. The Lares 557 compact head increased operator visibility and interocclusal access, the best of all models evaluated. The Lares 557 maintained only 42% of its fiberoptic intensity after 1,000 simulated clinical use/sterilization cycles. Polishing the fiberoptic lenses improved the transmission slightly to 49%. The noise level of the Lares 557 was measured at 72 decibels. The noise level of all handpieces evaluated ranged from 69 decibels to 77 decibels. One hundred percent of the Lares 557 test handpieces functioned over 500 uses but none survived to 750 uses. The push-button chuck was judged to be difficult to use and frequently required the use of hemostats to extract the bur from the handpiece. **The Lares 557 Turbo** is rated **Marginal** for use by the federal dental services.

(Lt Col Leonard, Mr Gambal, SSgt Pena, DT1 McMillan, SSgt Martin)

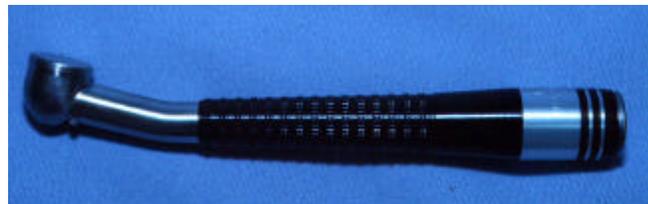
55-18 Lares 757 Workhorse High-Speed Handpiece

(Project 96-53)

The Lares 757 Workhorse fiberoptic high-speed handpiece has a larger-sized head and is designed for heavier cutting. The handpiece can be heat sterilized in either an autoclave or chemiclave. The free running speed is reported to be 360,000 RPM @ 32 psi which was confirmed by DIS laboratory testing. Both the push-button chuck and turbine are field replaceable and easily accomplished. The handpiece is connected to the dental unit handpiece hose by either the Lares Euro-Style (ISO-C) Apollo Coupler or the Lares Integral Swivel Fiberoptic Coupler. Both couplers provide easy handpiece interchangeability and 360-degree swivel. The handpiece (coupler included) measures 14.8 cm in length and weighs 1.6 ounces. The handpiece head diameter and length measure 13 mm and 13.5 mm respectively. The distance from the back of the handpiece to the tip of a standard 19 mm bur (interocclusal clearance) is 22 mm. The handpiece is warranted against defects in materials and workmanship for one year excluding the chuck, which is warranted for 90 days.

Manufacturer:

Lares Research
 295 Lockheed Avenue
 Chico, CA 95926
 (800) 347-3289
 (916) 345-1767
 (916) 345-1870 FAX



Suggested Retail Prices:

757 Workhorse Fiberoptic Handpiece \$419.00

Integral Fiberoptic Swivel Coupler	\$86.40
757 Workhorse w/ Swivel Coupler	\$343.20
Replacement Turbine Cartridge	\$127.20

ADVANTAGES:

- + Low cost.
- + Excellent power (14.6 watts).
- + Maintained 71% of fiberoptic intensity after 1,000 simulated clinical use/sterilizations.
- + Turbine cartridge is field replaceable.
- + Chuck is field replaceable independent of turbine.
- + 360-degree swivel coupler.
- + Best interocclusal clearance of all models evaluated (same as Lares 557).
- + Push-button bur release.
- + Turbine warranted for one year.

DISADVANTAGES:

- 83% of test handpieces failed by 1000 simulated clinical use/sterilizations.
- Push-button chuck difficult to use.
- Requires lubrication before and after sterilization.
- Large head diameter reduces visibility.
- Chuck warranted for only 90 days.

SUMMARY AND CONCLUSIONS:

The Lares 757 Workhorse fiberoptic high-speed handpiece is the least expensive handpiece of the models evaluated. Its power (14.6 watts) was second only to the KaVo 640B. The Lares 757 maintained 71% of its fiberoptic intensity after 1,000 simulated clinical use/sterilization cycles. Polishing the fiberoptic lenses improved the transmission slightly to 75%. The noise level of the Lares 757 was measured at 72 decibels. The noise level of all handpieces evaluated ranged from 69 decibels to 77 decibels. The Lares 757 has a large diameter head which decreases operator visibility but its interocclusal access was tied with the Lares 557 as the best of all models evaluated. Eighty-three percent of the Lares 757 test handpieces functioned over 500 uses, 50% over 750 uses but only 17% survived 1,000 simulated clinical use/sterilizations. The push-button chuck was judged to be difficult to use and frequently required the use of hemostats to extract the bur from the handpiece. **The Lares 757 Workhorse** is rated **Marginal** for use by the federal dental services.

(Lt Col Leonard, Mr Gambal, SSgt Pena, DT1 McMillan, SSgt Martin)

55-19 Midwest Quiet-Air L High-Speed Handpiece

(Project 96-52)

The Midwest Quiet-air L fiberoptic high-speed handpiece has a larger head to facilitate heavier cutting procedures. The handpiece can be heat sterilized in either an autoclave or chemiclave. The free running speed was measured and found to be 406,000 RPM @ 30 psi. The handpiece utilizes a unique Power Lever Chucking System which provides a secure grip on bur shanks slightly larger or smaller than ISO standards. The turbine is field replaceable by authorized federal service dental clinics or can be serviced by Midwest via air express in two business days for essentially the same cost. To provide a quick-connect and swivel, Midwest uses a combination of a quick-connect swivel hose and quick-connect adapter rather than a quick-connect swivel coupler like most other handpiece manufacturers. The adapter is required on all handpieces but the number of hoses required is dependent on the number of dental units and hoses requiring a quick-connect swivel. The system provides easy handpiece

interchangeability and 360-degree swivel. The handpiece measures 14.2 cm and weighs 2.5 ounces. The handpiece head diameter and length measure 10.8 mm and 16.7 mm respectively. The distance from the back of the handpiece to the tip of a standard 19 mm bur (interocclusal clearance) is 23.75 mm. The handpiece is warranted against defects in materials and workmanship for six months.

Manufacturer:

DENTSPLY Midwest
901 West Oakton Street
Des Plaines, IL 60018-1884
(800) 800-7202
(847) 640-4832
(847) 640-6165 FAX



Suggested Retail Prices:

Quiet-Air L Fiberoptic Handpiece	\$775.00
Replacement Turbine Cartridge	\$199.00
Power Optic Quick-Connect Hose with Swivel	\$295.00
In-Sight II Quick-Connect Hose with Swivel	\$315.00
Quick-Disconnect Coupler	\$23.50

Government Prices:

Quiet-Air L Fiberoptic Handpiece	\$387.60
Replacement Turbine Cartridge	\$122.85
Power Optic Quick-Connect Hose with Swivel	\$142.29
In-Sight II Quick-Connect Hose with Swivel	\$152.49
Quick-Disconnect Coupler	\$12.60

ADVANTAGES:

- + Adequate power (10.0 watts).
- + Maintained 81% of fiberoptic intensity after 1,000 simulated clinical use/sterilizations.
- + Turbine cartridge is field replaceable.
- + Power Lever chuck able to securely grip bur shanks slightly larger or smaller than ISO standards.
- + Lubrication not required after sterilization.
- + Quick-Connect hose and 360-degree swivel.

DISADVANTAGES:

- 50% of test handpieces failed by 1,000 simulated clinical use/sterilizations.
- Large head size reduces access to restricted areas of mouth.
- Power Lever chuck release more difficult to use than push button style.
- Decreased concentricity with use.

SUMMARY AND CONCLUSIONS:

The Midwest Quiet-Air L fiberoptic high-speed handpiece has a long history of reliable service. Its power (10.0 watts) was in the lower third of all models evaluated, but was well over the 5 watts required to be clinically acceptable. The Quiet-Air maintained 81% of its fiberoptic intensity after 1,000 simulated clinical use/sterilizations, the best of all models evaluated. Polishing the fiberoptic lenses improved the transmission slightly to 82%. The operator's visibility around the Quiet-Air head is average compared to other handpieces evaluated, but access may be limited due to the large head design. The noise level of the Midwest Quiet-Air was measured at 75 decibels. The noise level of all handpieces evaluated ranged from 69 decibels to 77 decibels. The Quiet-Air met the International Standards Organization (ISO) concentricity specifications when new, but after 750 simulated uses it was twice as eccentric as the other handpieces evaluated. Eighty-three percent of the Midwest Quiet-Air test handpieces functioned over 750 uses and 50% were functioning after 1,000 cycles. The **Midwest Quiet-Air L** is rated **Acceptable** for use by the federal dental services.

(Lt Col Leonard, Mr Gambal, SSgt Pena, DT1 McMillan, SSgt Martin)

55-20 Midwest Tradition L High-Speed Handpiece

(Project 96-51)

The Midwest Tradition L fiberoptic high-speed handpiece is lightweight and features a compact head to improve access to restricted areas of the mouth. The handpiece can be heat sterilized in either an autoclave or chemiclave. The free running speed was measured and found to be 424,000 RPM @ 30 psi. The handpiece utilizes a unique Power Lever Chucking System which provides a secure grip on bur shanks slightly larger or smaller than ISO standards. The turbine is field replaceable by authorized federal service dental clinics or can be serviced by Midwest via air express in two business days for essentially the same cost. To provide a quick-connect and swivel, Midwest uses a combination of a quick-connect swivel hose and quick-connect adapter rather than a quick-connect swivel coupler like most other handpiece manufacturers. The adapter is required on all handpieces but the number of hoses required is dependent on the number of dental units and hoses requiring a quick-connect swivel. The system provides easy handpiece interchangeability and 360-degree swivel. The handpiece measures 14.2 cm and weighs 1.8 ounces. The handpiece head diameter and length measure 10.6 mm and 12 mm respectively. The distance from the back of the handpiece to the tip of a standard 19 mm bur (interocclusal clearance) is 22.3 mm. The handpiece is warranted against defects in materials and workmanship for six months.

Manufacturer:

DENTSPLY Midwest
901 West Oakton Street
Des Plaines, IL 60018-1884
(800) 800-7202
(847) 640-4832
(847) 640-6165 FAX



Suggested Retail Prices:

Tradition L Fiberoptic Handpiece	\$775.00
Replacement Turbine Cartridge	\$199.00
Power Optic Quick-Connect Hose with Swivel	\$295.00
In-Sight II Quick-Connect Hose with Swivel	\$315.00
Quick-Disconnect Coupler	\$23.50

Government Prices:

Tradition L Fiberoptic Handpiece	\$387.60
Replacement Turbine Cartridge	\$122.85
Power Optic Quick-Connect Hose with Swivel	\$142.29
In-Sight II Quick-Connect Hose with Swivel	\$152.49
Quick-Disconnect Coupler	\$12.60

ADVANTAGES:

- + Better than average power (13.1 watts).
- + Turbine cartridge is field replaceable.
- + Power Lever chuck able to securely grip bur shanks slightly larger or smaller than ISO standards.
- + Lubrication not required after sterilization.
- + Small head size and visibility angle improves visibility and access.
- + Quick-Connect hose and 360-degree swivel.

DISADVANTAGES:

- 66% percent of test handpieces failed by 1,000 simulated clinical use/sterilizations.
- Fiberoptics degraded 62% after 1,000 simulated clinical use/sterilizations.

- Power Lever chuck release more difficult to use than push button style.
- Decreased concentricity with use.

SUMMARY AND CONCLUSIONS:

The Midwest Tradition L fiberoptic high-speed handpiece has the largest market share in the federal dental services. Its power (13.1 watts) was in the middle third of all models evaluated. The Tradition maintained only 38% of its fiberoptic intensity after 1,000 simulated clinical use/sterilizations. Polishing the fiberoptic lenses improved the transmission to 47%. The compact head increases operator visibility and access. The noise level of the Tradition was measured at 77 decibels. The noise level of all handpieces evaluated ranged from 69 decibels to 77 decibels. The Tradition met the International Standards Organization (ISO) concentricity specifications when new, but after 750 simulated uses it was twice as eccentric as the other handpieces evaluated. Sixty-six percent of the Midwest Tradition test handpieces functioned over 750 uses but only 33.3% were functioning after 1,000 cycles. The **Tradition L** is rated **Marginal** for use by the federal dental services.

(Lt Col Leonard, Mr Gambal, SSgt Pena, DT1 McMillan, SSgt Martin)

55-21 Star 430 SWL Starbright High-Speed Handpiece

(Project 96-50)

The Star 430 SWL Starbright fiberoptic high-speed handpiece is designed for use in a wide range of dental restorative procedures. The push-button auto-chuck turbine is lube-free and utilizes its Vortex™ Air Seal to reduce debris contamination of the turbine bearings. The handpiece can be heat sterilized in either an autoclave or chemiclave. The free running speed is reported to be 430,000 RPM @ 34 psi which was confirmed by DIS testing. The turbine is easily field replaceable to reduce handpiece down time. The handpiece is connected to the dental unit handpiece hose with Star's 360° Quick-Connect Swivel Coupler. The coupler provides easy handpiece interchangeability and 360-degree swivel. The Star handpiece (including coupler) measures 12.4 cm in length and weighs 2.3 ounces. The handpiece head diameter and length measure 11 mm and 14.1 mm respectively. The distance from the back of the handpiece to the tip of a standard 19 mm bur (interocclusal clearance) is 22.2 mm. The handpiece is warranted against defects in materials and workmanship for one year.

Manufacturer:

Star Dental
 1816 Colonial Village Lane
 Lancaster, PA 17601
 (717) 291-1161
 (717) 291-9742 FAX



Suggested Retail Prices:

Star 430 SWL Starbright Handpiece	\$825.00
Star 430 SWL Starbright Handpiece & 360° Quick Disconnect Swivel	\$975.00
Replacement Turbine Cartridge	\$299.00
360° Quick Disconnect Swivel	\$150.00

Government Prices:

Star 430 SWL Starbright Handpiece	\$403.00
Star 430 SWL Starbright Handpiece & 360° Quick Disconnect Swivel	\$487.00
Replacement Turbine Cartridge	\$179.00
360° Quick Disconnect Swivel	\$123.80

ADVANTAGES:

- + 100% of test handpieces were operating at 1,000 simulated clinical use/sterilizations.

- + Better than average power (12.9 watts).
- + Maintained 73% of fiberoptic intensity after 1,000 simulated clinical use/sterilizations.
- + 360-degree swivel coupler.
- + Lube free turbine.
- + Turbine cartridge is field replaceable.
- + Excellent concentricity.
- + Push-button bur release.
- + Turbine warranted for one year.

DISADVANTAGES:

- 29% loss in power at 1,000 simulated clinical use/sterilizations.

SUMMARY AND CONCLUSIONS:

The Star 430 SWL Starbright fiberoptic high-speed handpiece is the only no-lube highspeed handpiece on the market. Its power (12.9 watts) was in the middle third of all handpieces evaluated. The Star 430 SWL maintained 73% of its fiberoptic intensity after 1,000 simulated clinical use/sterilization cycles. Polishing the fiberoptic lenses improved the transmission slightly to 79%. The noise level of the Star 430SWL was measured at 69 decibels. The noise level of all handpieces evaluated ranged from 69 decibels to 77 decibels. One hundred percent of the Star 430 SWL test handpieces functioned after 1,000 simulated clinical use/sterilizations. However, it was the only handpiece to demonstrate power loss yet continue to operate. All other models evaluated generally maintained their original power up to the point of catastrophic bearing failure. Baseline power was maintained through 750 simulated uses and only began to degrade at 1,000 uses. **The Star 430SWL Starbright** is rated **Recommended** for use by the federal dental services.

(Lt Col Leonard, Mr Gambal, SSgt Pena, DT1 McMillan, SSgt Martin)

55-22 A-dec/W&H 896 High-Speed Fiberoptic Handpiece

(Project 96-55)

The A-dec/W&H 896 fiberoptic high-speed handpiece is imported from Austria and distributed by A-dec. The 896 has a compact head and is designed for use in a wide range of dental restorative procedures. It is available with the standard 5-hole fixed connection, or designed for use with the W&H 924 Roto Quick Coupler. This design incorporates the fiberoptic bulb inside the handpiece to reduce the distance of the source light to the handpiece head. The coupler provides easy handpiece interchangeability and 360° swivel. The handpiece has a push-button auto-chuck and can be heat sterilized in either an autoclave or chemiclave. The free running speed is reported to be 370,000 RPM @ 32 psi which was confirmed by DIS testing. A pressure regulating screw is standard that allows the handpiece to be used with either air line pressures of 32 psi or 45 psi. The turbine is field replaceable to reduce handpiece down time but A-dec recommends returning the handpiece to them for servicing. The W&H 896 handpiece (including coupler) measures 12.1 cm in length and weighs 2.1 ounces. The handpiece head diameter and length measure 10.4 mm and 13.8 mm respectively. The distance from the back of the handpiece to the tip of a standard 19 mm bur is 23 mm. The handpiece is warranted against defects in materials and workmanship for six months.

Manufacturer:

A-dec / W&H
 2601 Crestview Drive
 Newberg, OR 97132
 (800) 547-1883
 (503) 538-7478
 (503) 538-0276 FAX



Suggested Retail Prices:

896 Highspeed Handpiece	\$795.00
Replacement Turbine Cartridge	\$275.00
924 Roto Quick Coupling	\$200.00

Government Prices:

896 Highspeed Handpiece	\$431.45
Replacement Turbine Cartridge	\$149.24
924 Roto Quick Coupling	\$108.54

ADVANTAGES:

- + 100% of test handpieces were operating at 1,000 simulated clinical use/sterilizations.
- + Adequate power (10.1 watts).
- + Small, compact head offers excellent visibility.
- + Accepts airline pressures of 32 psi or 45 psi.
- + 360° swivel coupler.
- + Excellent concentricity.
- + Push-button bur release.
- + Turbine field replaceable.
- + Requires lubrication prior to sterilization only.

DISADVANTAGES:

- Fiberoptics degraded 46% after 1,000 simulated clinical use/sterilizations.
- Interocclusal clearance in bottom third of handpieces evaluated.

SUMMARY AND CONCLUSIONS:

The W&H 896 fiberoptic highspeed handpiece performed better than average for most parameters evaluated. Its power (10.1watts) was in the lower third of all models evaluated, but was well over the 5 watts required to be clinically acceptable. The W&H 896 maintained only 54% of its fiberoptic intensity after 1,000 simulated clinical use/sterilization cycles without any improvement after the fiberoptic lenses were polished. The noise level of the W&H 896 was measured at 71 decibels. The noise level of all handpieces evaluated ranged from 69 decibels to 77 decibels. The compact head increased operator visibility but the handpiece placed in the bottom third of all handpieces evaluated for interocclusal clearance. 100% of the W&H 896 test handpieces functioned after 1,000 simulated clinical use/sterilizations without any degradation in power. The **W&H 896** is rated **Acceptable** for use by the federal dental services.

(Lt Col Leonard, Mr Gambal, SSgt Pena, DT1 McMillan, SSgt Martin)

55-23 A-dec/W&H 898 High-Speed Fiberoptic Handpiece**(Project 96-56)**

The A-dec/W&H 898 fiberoptic high-speed handpiece is imported from Austria and distributed by A-dec. The 898 has a large turbine head with triple spray cooling. It is designed for use in practices with a significant amount of heavy cutting. The 898 is available with the standard fixed 5-hole connection, or designed for use with the W&H 924 Roto Quick Coupler. This design incorporates the fiberoptic bulb inside the handpiece to reduce the distance of the source light to the handpiece head. The coupler provides easy handpiece interchangeability and 360-degree swivel. The handpiece has a push-button auto-chuck and can be heat sterilized in either an autoclave or chemiclave. The free running speed is reported to be 350,000 RPM @ 32 psi which was confirmed by DIS testing. A pressure regulating screw is standard that allows the handpiece to be used with either airline pressures of 32 psi or 45 psi. The turbine is field replaceable to reduce handpiece down time but A-dec recommends returning the handpiece to them for servicing. The W&H 898 handpiece (including coupler) measures 12.1 cm in length and weighs 2.2 ounces. The handpiece head diameter and length measure 12.7 mm and 15.3 mm respectively. The distance from the back of the handpiece to the tip of a standard 19 mm bur is 23

mm. The handpiece is warranted against defects in materials and workmanship for six months.

Manufacturer:

A-dec/W&H
2601 Crestview Drive
Newberg, OR 97132
(800) 547-1883
(503) 538-7478
(503) 538-0276 FAX



Suggested Retail Prices:

898 Highspeed Handpiece	\$895.00
Replacement Turbine Cartridge	\$275.00
924 Roto Quick Coupling	\$200.00

Government Prices:

898 Highspeed Handpiece	\$431.45
Replacement Turbine Cartridge	\$149.24
924 Roto Quick Coupling	\$108.54

ADVANTAGES:

- + 100% of test handpieces were operating at 1,000 simulated clinical use/sterilizations.
- + High power (14.0 watts).
- + Accepts airline pressures of 32 psi or 45 psi.
- + 360° swivel coupler.
- + Excellent concentricity.
- + Push-button bur release.
- + Turbine field replaceable.
- + Requires lubrication prior to sterilization only.

DISADVANTAGES:

- Visibility and interocclusal clearance in bottom third of handpieces evaluated.
- Lost 39% of fiberoptic intensity after 1,000 simulated clinical use/sterilization cycles.

SUMMARY AND CONCLUSIONS:

The W&H 898 fiberoptic highspeed handpiece performed better than average for most parameters evaluated. Its power (14.0 watts) was in the upper third of all models evaluated. The W&H 898 maintained only 61% of its fiberoptic intensity after 1,000 simulated clinical use/sterilization cycles and degraded further after the fiberoptic lenses were polished. Operator visibility was the worst of all handpieces evaluated and it placed in the bottom third of all handpieces evaluated for interocclusal clearance. The noise level of the W&H 898 was measured at 71 decibels. The noise level of all handpieces evaluated ranged from 69 decibels to 77 decibels. One hundred percent of the W&H 898 test handpieces functioned after 1,000 simulated clinical use/sterilizations without any degradation in power. The **W&H 898** is rated **Acceptable** for use by the federal dental services.

(Lt Col Leonard, Mr Gambal, SSgt Pena, DT1 McMillan, SSgt Martin)

55-24 Synopsis of Resin Composite Systems

(Project 97-41)

Currently, there is an abundance of resin composite systems on the market. Resin composites have continued to increase in use in recent years. Composite is now the most frequently utilized esthetic restorative material. When Clinical Research Associates surveyed dentists in private practice in 1990

compomers release less fluoride and may not inhibit artificial caries lesions as well as GIC and RMGI materials. In addition, compomers do not function as rechargeable fluoride-releasing reservoirs. Compomers do not undergo a true acid/base glass ionomer reaction and all currently marketed compomers require visible light activation for setting.

F2000 is 3M's compomer restorative material. 3M lists F2000 as a one-part, light curable, fluoride releasing, radiopaque paste. 3M purports F2000 with excellent physical properties and good clinical handling characteristics. It is available both in single-use capsules or multi-dose syringes. F2000 is available in 13 shades (9 Vita and 4 specialty). This glass filler has an average particle size of 3 μm with a range of 1 - 10 microns. Filler loading is 84 percent by weight, 67 percent volume. F2000 is claimed to exhibit less microleakage than other compomers, which is attributed also to F2000's coefficient of thermal expansion (12.6 ppm/ $^{\circ}\text{C}$) closely matching dentin's (11ppm/ $^{\circ}\text{C}$). 3M states that F2000 is indicated for Class V (to include cervical erosion/abrasion lesions); root caries; Class I and II in primary teeth; Class III; Class II laminate or "sandwich" technique; temporary repairs; and core buildups (where approximately 50% remaining tooth structure provides support).

Source:

3M Dental Products
3M Center
Building 275-2SE-03
St. Paul, MN 55144-1000
(800) 451-5761 EXT 1
(800) 634-2249
(612) 737-8761
www.mmm.com/dental

Suggested Retail Price:

\$208.35	3M F2000 Compomer Restorative - Capsule (Part # 2023) Introductory Kit: <ul style="list-style-type: none">60 - 0.2 g Capsules<ul style="list-style-type: none">-10 each of shades A2, A3, A4, B2, C2, D36 ml bottle of Single Bond Adhesive3 ml phosphoric acid etchant syringe and tipsBrush Handle100 Fiber tip applicatorsShade guideOne-hole mixing wellTechnique guides
\$48.35	Additional Capsules in lots of ten capsules each in the various shades available: A2, A3, A3.5, A4, B2, B3, C2, C4, D3, Pedo Paste, Cervical Gray, Cervical Yellow, Blue (for core buildups).
\$243.35	3M F2000 Compomer Restorative - Syringe Introductory Syringe Kit (Part # 2022) <ul style="list-style-type: none">Five - 4.0 g Syringes<ul style="list-style-type: none">-One each of shades A2, A3, A4, C2, D36 ml bottle of Single Bond Adhesive3 ml phosphoric acid etchant syringe and tipsBrush Handle100 Fiber tip applicatorsMixing PadShade guideOne-hole mixing well

Technique guides

\$48.35	Additional 4.0 g syringes of each shade (as in capsules)
\$65.00	3M F2000 Compomer Primer/Adhesive in Clicker™ Dispensing System (Item # 2024) Contains 1 – 2.6ml Primer/Adhesive

Government Price:

\$135.45	F2000 Introductory Pack - Capsule (Part # 2023) as described above.
\$31.45	Additional Capsules (as listed above)
\$158.20	F2000 Introductory Pack - Syringe (Part # 2022) as described above.
\$31.45	Additional Syringes (as listed above)
\$42.25	3M F2000 Compomer Primer/Adhesive in Clicker™ Dispensing System (Item # 2024) as described above.

ADVANTAGES

- + Straight forward, readable instructions with adequate detail and graphics.
- + Logical packaging configuration.
- + Clinical evaluators found acceptable esthetics.
- + Better clinical handling characteristics than glass ionomer materials.
- + Adequate viscosity that resists slumping.
- + Adequate working time.
- + Compatible with existing composite resin restorative procedures.
- + Simple delivery system.
- + Radiopaque.
- + Potential for fluoride release.
- + Surface hardness is greater than that of most compomers.
- + Acceptable dentinal bond strength with supplied dentin bonding agent.

DISADVANTAGES

- Evaluators reported it was softer than composite material during finishing and polishing.
- Requires dentin bonding agent for tooth structure adhesion.
- Studies report less fluoride release than glass ionomer materials.
- Not as esthetic as composites.
- No long-term clinical data.
- Coefficient of thermal expansion determined to be similar to composites.

SUMMARY AND CONCLUSIONS:

F2000 compomer restorative material was well received by clinical evaluators. Evaluators appreciated its straightforward delivery system and easy to read instructions. F2000 was found to be compatible with existing composite techniques and demonstrated adequate working time with viscosity that resisted slumping. The majority of evaluators liked F2000's esthetics and thought its clinical handling characteristics were better than resin modified glass ionomer materials. F2000 demonstrates radiopacity, adequate dentin shear bond strength with Single Bond dentin bonding agent, and better surface hardness than most compomers. The manufacturer's reported coefficient of thermal expansion (12.4 ppm/°C) was not confirmed by the US Army Dental Materials Testing Laboratory, which found the coefficient of thermal expansion to be 33 ppm/°C. This is approximately three times greater than tooth

structure. Compomers as a class do not yet have long term clinical data. **F2000** is rated **Acceptable** for federal dental clinic use.

(Lt Col Roberts)

55-26 3M Iso-Temp Temporary Material

(Project 98-02)

Composite resin provisional materials have gained recent popularity. These materials are an improvement compared to acrylics because the composite temporary materials shrink less, are less exothermic, demonstrate improved esthetics, and may be repaired with light-cured composite restorative resins. Although overall improved materials as compared to acrylics, the composite resins do exhibit some disadvantages. The first is increased cost. Second, clinicians may find composites problematic in that their viscosity usually cannot be altered and they exhibit a sticky, air-inhibited surface which may complicate clinical handling. Examples of composite temporary materials include Protemp Garant (ESPE), Luxatemp (DMG), and Integrity (Caulk).

3M recently introduced Iso-Temp™ Temporary Material. 3M markets Iso-Temp™ as a “simple alternative to traditional self-cured provisional materials.” 3M lists Iso-Temp™ as a multi-phase, automixed material composed of ethoxylated bis-GMA, multi-functional methacrylate esters, and glass fillers. The result is purported to be a creamy, low-viscosity material that is compatible with current methods of temporization. Iso-Temp™ offers several minutes of flexible-stage working time allowing removal without locking into undercuts. The Iso-Temp™ setting reaction is described by 3M as undergoing three stages. Stage 1 is described as a highly flowable state which is readily molded in a matrix. Stage 2 is illustrated as formation of an extended flexible stage. It is in Stage 2 that the material may be removed and excess material grossly removed with crown and bridge scissors. Stage 3 is the formation of a highly cross-linked, rigid polymethacrylate network. Iso-Temp™ is advertised as compatible with both direct and indirect techniques. However, 3M’s technique description is heavily weighted towards the direct technique. The mixed material is dispensed into the matrix or impression and seated intraorally. Working time for this step is stated as one minute. Iso-Temp™ should be removed from the mouth after three minutes (four minutes if using alginate impression). 3M states that Iso-Temp™ may be left in the mouth for up to six minutes, if desired. At this step, the material may be grossly trimmed with crown and bridge scissors. After this initial trimming, Iso-Temp™ should be returned intraorally for fit verification. At this time a 10-second, visible light occlusal “tack cure” is acceptable to reduce possible distortion. After fit verification, the temporary is removed from the mouth and each unit light cured for 30 seconds. After final cure, the temporary is finished and polished in the usual manner. It is interesting to note that 3M recommends the final impression should be made before Iso-Temp™ temporary fabrication in order to avoid impression inhibition caused by this material. For worn or older temporary repair the older temporary should be roughened and undercuts placed in the repair area. Also, light cured composite restorative material can be used to repair old or new Iso-Temp™ temporaries. Based on 3M estimates, one cartridge should be sufficient to make 38 single-molar and 20 three-unit bridges. Iso-Temp’s™ marketed advantages include direct automixed delivery to the matrix; operator control/extended working time in flexible stage; light cure on demand; minimal odor, shrinkage, heat generation; and good wear resistance and esthetics. Iso-Temp™ is available in four Vita® shades: A1, A2, A3.5, and C2.

Manufacturer:

3M Dental Products Division
3M Health Care
3M Center, Bldg 275-2SE-03
St. Paul, MN 55144-1000
(800) 634-2249
(612) 737-8761

Suggested Retail Price:TM

\$210.00 IsoTemp Provisional Restoration Material Introductory Kit (Item # 4500)

Contents:

- 56-gm cartridge A2 resin
- 56-gm cartridge A3.5 resin
- 30 mixing tips
- One 10:1 ratio Impression Gun Plunger
- Instructions
- Laminated technique cards

Government Price:TM

\$126.00 IsoTemp Provisional Restoration Material Introductory Kit (Item # 4500)

(Contents same as above)

ADVANTAGES

- + Manufacturer's instructions very readable with adequate detail and technique description.
- + Packaging configuration and dispensing system well-liked by users.
- + Automix cartridge system provides homogenous material mix.
- + Minimal heat production.
- + Good esthetics and translucency as judged by clinical evaluators.
- + Unique flexible stage that allows gross contouring.
- + Material can be visible light cured when desired.
- + Good-to-excellent marginal integrity.
- + Adequate working time.
- + Convenient laminated instruction cards.

DISADVANTAGES

- Material lacks sufficient radiopacity.
- More clinical time involved compared to similar auto cured materials.
- Thin initial viscosity may produce thin and friable margins.
- Flexible stage requires some "learning curve".
- Flexible stage reported to exhibit brittle tendency.
- Reported difficulty repairing with either additional material or visible light cured composite resin.
- Cannot be utilized for emergency "block" temporary fabrication.

SUMMARY AND CONCLUSIONS:

Iso-TempTM is an ethoxylated Bis-GMA provisional crown and bridge material that features automix delivery and is purported to be compatible with most provisional matrix systems. It has a unique flexible stage that allows gross contouring but can also be fully polymerized when desired by visible light curing. DIS laboratory tests revealed that Iso-TempTM displayed minimal curing heat production and satisfactory working time. However, this material lacks adequate radiopacity. Clinical users liked the material's packaging, automix delivery system, esthetics, and marginal integrity. Evaluators found Iso-TempTM may require more clinical steps and time than other systems, required a "learning curve" in handling the sometimes brittle flexible stage, and demonstrated some difficulty when attempting repair. All evaluators rated Iso-TempTM as above average and most would recommend its purchase for their clinic's general use. **Iso-TempTM** is rated **Acceptable** for federal service dental clinic use.

(Lt Col Roberts)

INFECTION CONTROL

55-27 Steri-Dent®200 Dry Heat Sterilizer

(Project 97-38)

The Steri-Dent® 200 Dry Heat Sterilizer by Steri-Dent® Corporation is designed to provide a safe and effective means of sterilizing instruments. The sterilizer is designed to operate and maintain a temperature of 320°F for dry heat convection sterilization. The manufacturer recommends 30 minutes for unwrapped instruments and 60 minutes for wrapped instruments. Sterilizing bags (item ST-5) are available from the Steri-Dent® Corporation. The Model 200 is equipped with an on/off power switch, timer on and heat on indicator lights, a glass thermometer, thermostat, temperature regulator knob and an adjustable automatic timer for up to 90 minutes with "Hold" position. The Steri-Dent® 200 is constructed of high-grade stainless steel, weighs 17 pounds and measures 15.5 inches wide by 9.5 inches deep by 10.5 inches high. The inside chamber measures 12.5 inches wide by 7.5 inches deep by 5 inches high. The chamber can accommodate two trays (8" W x 4" D x 1.5" H). Steri-Dent® offers optional 10-instrument utility trays (7.2 inches by 5.6 inches) and 16-instrument utility trays (11.2 inches by 7.2 inches by 2 inches) in silver, red, dark blue, and light blue. The Steri-Dent® 200 can be configured for either 120 or 240 volts, 50/60 Hz, and is UL listed.

Manufacturer:

Steri-Dent® Incorporated
1330-13 Lincoln Ave.
Holbrook, NY 11741
(800) 346-3368
(516) 737-4646
(516) 737-0036 FAX

Suggested Retail Price: \$595.00

Government Price: \$295.00

National Stock Number: 6530-00-962-9965



ADVANTAGES:

- + Dry heat sterilization should reduce corrosion and improve function and life of instruments.
- + Simple to operate and maintain.
- + Has automatic timer with "hold" position.
- + Can be configured for either 120 or 240 volts.
- + Equipped with temperature regulator.
- + UL listed.
- + Relatively inexpensive.

DISADVANTAGES:

- Lacked hospital grade plug or equivalent.
- Difficult to adjust and verify temperature.
- No preset cycles.
- Small chamber size.
- Uneven chamber temperature.
- No overheat protector, circuit breaker, or fuse.

- Does not provide a cool-down cycle.

SUMMARY AND CONCLUSIONS:

The Steri-Dent® 200 Dry Heat Sterilizer by Steri-Dent® Inc. provides a relatively inexpensive means of dry-heat sterilization. The unit is simple to operate and maintain but requires diligent technician supervision to ensure adequate sterilization. No mechanisms exist to protect against inadvertent failure to meet all sterilization parameters. The chamber temperature is initially difficult to adjust and the use of a thermometer for chamber temperature verification is less desirable than a digital display. Once warmed up, the cycle time for wrapped instruments including cool down is 80 minutes. Due to the long cycle time, the sterilizer should not be considered as a clinic's primary means of sterilization but as an adjunct sterilizer for instruments such as burs and ortho pliers susceptible to corrosion and damage from steam autoclaves. The Steri-Dent® 200 functioned flawlessly throughout the evaluation and was judged to be the same or better than other dry heat sterilizers the evaluators had used. The Steri-Dent® 200 is UL listed but does not contain a fuse or circuit breaker for electrical overload protection. These devices are not required but strongly recommended by the National Fire Protection Agency and other electrical safety organizations. DIS recommends that purchasers of this sterilizer install an in-line circuit breaker or fuse as well as a hospital-grade or equivalent plug prior to installation. With that disclaimer, the **Steri-Dent® 200 by Steri-Dent®** is rated **Acceptable** for use by the federal dental services.

(DT1 McMillan, Lt Col Leonard, Mr Gambal)

55-28 Cox/Bowmar 6000 Dry Heat Sterilizer

(Project 97-26)

The Cox/Bowmar Rapid Heat Transfer Sterilizer, Model 6000, by Alfa Equipment Company is designed to provide effective sterilization by means of rapid heat transfer. The sterilizer provides three sterilization cycle options, e.g., a 6-minute cycle for unwrapped burs and instruments, an 8-minute cycle for unwrapped handpieces, and a 12-minute cycle for wrapped instruments. The times listed for each cycle are the actual times the instruments are subjected to 375° F, and do not include warm-up and cool-down. An optional specially-designed handpiece drawer orients the handpieces such that the hot air is directed through the handpiece air and water tubings, however the use of the drawer precludes wrapping the handpieces for sterile storage. The Cox/Bowmar 6000 is equipped with a temperature probe and LED displays of temperature and cycle time. Cycle selection and the on/off standby control are activated by membrane switch touchpad controls. Error codes displayed by the sterilizer and explained in the operator's manual aid in determining the correction or service required by the user. The model 6000 is constructed of high-grade stainless steel and measures 17 inches square by 15 inches high. The wire mesh instrument drawer measures 8.75 inches square by 1.5 inches high and is designed to hold either wrapped or unwrapped burs, handpieces and other instruments. The Cox/Bowmar 6000 can be configured for either 120 or 220 volts 50/60 Hz and weighs 50 pounds.



Manufacturer:

Alfa Equipment Corporation
59 Madison Ave.
Hempstead, NY 11550
(800) 762-1586
(516) 489-3855
(516) 489-9364 FAX

Suggested Retail Price: \$3,600.00
Government Price: \$2,485.00

ADVANTAGES:

- + Dry heat sterilization should improve function and life of burs and hinged instruments.
- + Can be configured for either 120 or 240 volts.
- + Equipped with LED timer and temperature displays.
- + Three sterilization cycles available (unwrapped instruments, unwrapped handpieces, and wrapped instruments).
- + Error codes aids user in diagnosis of system malfunction.
- + Temperature probe monitors chamber internal temperature.
- + Temperature probe terminates the cycle if temperature drops below 375 degrees.
- + UL listed and CSA certified.

DISADVANTAGES:

- Instrument drawer is small.
- Standby mode must be manually activated.
- Standby mode lacks any status indicator.
- Does not provide a cool-down cycle.
- Lack of a secure closure for the instrument drawer may cause instability of drawer and loss of chamber heat.
- Sterilization temperatures (375° F) continue until sterilizer cycle is manually terminated.
- Instruments wrapped in plastic pouches will burn if the sterilizer is not placed in the standby mode.
- Lacks a comprehensive technical manual with parts breakdown and exploded parts listings.
- Uneven chamber heating.
- Unable to terminate a cycle without unplugging sterilizer from wall outlet.

SUMMARY AND CONCLUSIONS:

The Cox/Bowmar Rapid Heat Transfer Sterilizer, Model 6000, by Alfa Equipment Company met most of the features required on the DIS Sterilizer Checklist. The Cox/Bowmar 6000 successfully passed the electrical safety check. The sterilizer offers three different sterilization cycles including a wrapped cycle. Rust and corrosion should be minimized with dry heat when compared with steam sterilization making this type of sterilizer a good choice for carbide burs and orthodontic pliers. Overall, the clinical evaluators rated the sterilizer as "Good". However, the lack of an automatic standby mode and cool down cycle requires the operator to be physically present when the sterilization cycle ends to manually remove the sterilizer contents and place the sterilizer in the standby mode. When in a sterilization cycle the model 6000 cannot be turned off unless the user manually unplugs it from the wall outlet. If wrapped packs are used, failure to manually end the cycle and remove the contents results in charred packs. The lack of any indicator to signify standby mode status only compounds the problem. Clinical evaluators reported the sterilizer was fast, simple and easy to use and appeared to reduce rust and corrosion. Although the sterilization cycle for unwrapped instruments is only six minutes, it requires up to 41 minutes from a cold start and 34 minutes from a warm start before instruments are available due to warm-up and cool-down requirements. The small chamber size was identified as a negative in addition to the lack of a cool-down feature. The Cox/Bowmar 6000 operator manual is minimal and a technical manual with parts breakdown and parts listings was not provided. The **Cox/Bowmar Rapid Heat Sterilizer Model 6000** by Alfa Equipment Company is rated **Marginal** for use by the federal dental services.

(DT1 McMillan, Col Leonard, Mr Gambal)

55-29 Safe-Mate Safety Needle

(Project 97-36)

The Safe-Mate Safety Needle comes packaged in a sterile plastic package and is comprised of two parts: the protective sleeve and the hub assembly. The protective sleeve is constructed of a 0.75-mm thick translucent, resilient plastic. The hub assembly is constructed from an opaque plastic hub and a flexible metal hypodermic needle. The needle is molded into the plastic hub during manufacture and provides a stable attachment point. The plastic hub is color coded to the gauge and length of the needle. The Safe-Mate Safety Needle attaches to standard metal aspirating syringes, both winged and wingless, in the same manner as an ordinary dental needle.

Manufacturer:

Septodont, Inc.
245-C Quigley Blvd
New Castle, DE 19720
(800) 872-8305
(302) 328-1102
(302) 328-5653 FAX



Suggested Retail Price:

\$14.95 Box of 50 disposable Safe-Mate Safety Needles with instructions.

Government Price:

\$10.45 Same as above.

ADVANTAGES:

- + Provides an engineering control that makes incorrect needle recapping less likely.
- + Should be more effective in preventing percutaneous injuries than a conventional dental needle.
- + Possible to see aspirated blood through translucent body assembly.
- + May offer additional protection should a carpule shatter under pressure.
- + Is disposable.
- + Syringe can be safely passed with needle's protective sleeve locked in place.
- + Meets OSHA Bloodborne Pathogen Standard for safe handling of dental needles.
- + Can be used for multiple injections.

DISADVANTAGES:

- Needle may not fit all aspirating syringes.
- May reduce oral cavity access.
- Evaluators found it difficult to see aspirated blood through the protective sleeve.
- Protective sleeve may interfere with previously bent needle during multiple injections.
- Produces increased volume of sharps waste.
- More expensive than using a conventional dental needle.
- Needle may not be suitable for intraligmental injections.
- More flexible than other dental needles.

SUMMARY AND CONCLUSIONS:

The Safe-Mate Safety Needle is a disposable dental needle designed to work with conventional aspirating syringes and allows users to give multiple injections. Evaluators found the Safe-Mate to be convenient and sharp. The protective sleeve makes percutaneous injuries less likely and providers were impressed with the quality of the needle. The product comes with complete instructions and is simple to assemble. Clinicians felt the Safe-Mate did not provide good access to all areas of the oral cavity and

that the protective sleeve may interfere with a bent needle. The Safe-Mate can be used as a substitute for a conventional dental needle but has several limitations that led the plurality (6/13) of the evaluators to rate it as "Fair." Shortcomings mentioned by the clinical users included difficulty in seeing aspirated blood through the translucent protective sleeve and reduced oral cavity access. Users also found it difficult to use the protective sleeve when bending the needle for additional injections. Laboratory testing found that the Safe-Mate was more flexible than the comparison needle of the same gauge and length. The Safe-Mate was judged by DIS personnel to exhibit a high degree of quality in its overall construction. The **Safe-Mate Safety Needle** is rated **Acceptable** for use by the federal dental services.

(SSgt Martin)

APPEARING IN FUTURE ISSUES OF *DENTAL ITEMS OF SIGNIFICANCE*--

Reviews of: SDI Amalgams, HI Dense TC Glass Ionomer, Dental EZ
AXCS Dental Chair,

Plus more Questions & Answers, Product Reviews from the
Literature, and New Dental Products.

Synopsis of Air Abrasion Units

Product Name	Abradent Model DV-1	PrepStar
Manufacturer	Crystal Mark DDS, Inc. 613 Justin Ave Glendale, CA 91201-2396 (888) 264-4337 (818) 247-3574 FAX	Danville Engineering 2021 Omega Road San Ramon, CA 94583 (800) 827-7940 (510) 838-0944 FAX
Price	Retail: \$3850.00 Govt: \$2995.00	Retail: \$2695.00 Govt: \$2425.00
Delivery System	Counter-top	Counter-top
Air Source	Dental office air (40 psi minimum required) Nitrogen or CO ₂ tank	Dental office air (60 psi minimum required); Optional PrimeAir Oilless compressor
Particle Size	27.5μ	27μ & 50μ
Powder Canisters / Switchable	Single / No	Single / No
Autoclavable Handpiece / Tips	Yes	Yes
Pressure Range	(0 – 140 psi)	(60 – 120 psi)
Adjustable Powder Flow	Yes (0 to 5 gm/min)	Yes (0.7 to 4.2 gm/min)
Cutting Modes	Continuous, Optional Power Pulse Mode (\$500)	Continuous
Nozzle Size / Delivery Angle	.011" .014" .018" .028" .032" / 45° 90° 180° Swivel handpiece allows ± 15° with 45° and 90° delivery angle tips	.015" .019" .026" / 45° 80° 120°
Low Powder Indicator	No	No
Trouble Indicator	No	No
Source-Air Filtering	Yes; oil & moisture	Yes; oil & moisture; Additional optional air filter available
Built-In Auxiliary Suction	No; Optional Dental Aerosol Evacuator (DAE) available (127 CFM)	No; Optional External RapidVac Dust Collector (36-40 CFM) available
Size & Weight	11"H x 13"W x 11" D 43 lbs	5.5"H x 6.5"W x 9" D 4.5 lbs
Compressor Noise Level	Not applicable	Optional PrimeAir Compressor (65 decibels @ 3ft)
Training Available	Yes; 8-hour course in California (no charge). Transportation at purchaser's expense. 2-hour regional course (no charge)	Video & operational instructions
Electrical	120v and 240v; UL pending	120v and 240v for optional RapidVac and PrimeAir
Comments	Low-tech appearance; analog gauges and mechanical switches. Weight precludes easy transport between operatories. Air pressure dependent on maximum office pressure obtainable, generally only 80 psi. Optional dental aerosol evacuator available (\$1695 w/o dryer, \$2195 with dryer). Dryer is used to remove excess moisture from poor quality source air. Abrasion resistant mirrors (\$65 or three for \$150)	Low-tech appearance; analog gauges and mechanical switches. Air pressure dependent on maximum office pressure obtainable, generally only 80 psi unless order optional air compressor. Optional PrimeAir Oilless Compressor (Retail:\$1499, Govt: \$1349); Optional External RapidVac Dust Collector (Retail: \$1290, Govt: \$1161); Optional air filter (Retail: \$299, Govt: \$269)

Data in this table was provided by manufacturers

Synopsis of Air Abrasion Units

Product Name	Air-Touch Desktop Model	Air-Touch Tower Model
Manufacturer	Dentsply Midwest Oakton Street Des Plaines IL 60018-1884 (708)-640-6165 FAX	Dentsply Midwest Oakton Street Des Plaines IL 60018-1884 (708)-640-6165 FAX
Price	Single Chamber: \$6,495.00 Govt: Dual Chamber: \$4,872.00	Retail: Dual Chamber: \$17,495.00 Single Chamber: \$15,495.00 Single Chamber: \$10,072.00
Delivery System		Portable, self-contained unit on wheels
Air Source		Built-in 1/3 HP oil-less compressor or CO ₂
Particle Size	27 & 50μ	μ & 50
Powder Canisters / Switchable		Choice of either single or dual / Yes for dual chamber model
Autoclavable	Yes	Yes
	(40 – 120 psi) in 10 psi increments	(40 – 120 psi) in 10 psi increments
Adjustable Powder Flow	No manual adjustment; automatic adjustment (3.2 gm/min to 5 gm/min depending on air pressure)	No manual adjustment; automatic adjustment (3.2 gm/min to 5 gm/min depending on air pressure)
Cutting Modes	Continuous, Timed (0.2, 0.5 to 2.5 sec in 0.5 sec increments), Boost	Continuous, Timed (0.2, 0.5 to 2.5 sec in 0.5 sec increments), Boost
Nozzle Size / Delivery Angle	.015" .018" .027" / 45° ° 120	.015" .018" .027" / 45° 90 120°
	Yes	Yes
	Yes	Yes
	Yes; filter membrane moisture control	Yes; filter membrane moisture control
Suction	No	intra- and extra-oral suction (19 CFM)
Size & Weight	9.5"H x 11.5"W x 16" D; 25 lbs	35"H x 14"W x 17.5" D; CO Model: 99 lbs, Compressor Model: 130
Compressor Noise Level		65 decibels @ one meter
Training Available		Yes; Videocassette, In-office clinical instruction (\$1000 honorarium)
Electrical		120v and 240v; UL listed, CSA certified
Comments	control. Comprehensive self-diagnostics and trouble-shooting guide. Air pressure dependent on maximum office pressure obtainable, psi unless use bottled gas.	Hi-tech appearance. Membrane touch controls facilitate infection Unique built-in intra- and extra-oral vacuum.

Synopsis of Air Abrasion Units

Product Name	KCP 5 Prepjet	KCP 10 Prepjet
Manufacturer	American Dental Technologies Suite 1100 Southfield, MI 48034 (810) 353-0663 FAX	American Dental Technologies Suite 1100 Southfield, MI 48034 (810) 353-0663 FAX
Price	Govt: \$3995.00	Retail: \$6995.00
Delivery System	Counter-top	
Air Source	Dental office air with built-in air-booster	Dental office air with built-in air-booster
Particle Size	27μ & 50μ	27μ & 50μ
Powder Canisters / Switchable	Single / No	Dual / Yes
Autoclavable Handpiece / Tips		Yes
Pressure Range	(0 – 130 psi)	(40, 60, 80, 100, 120, 130 psi)
Adjustable Powder Flow	No (constant 4.5 gm/min)	No (constant 4.5 gm/min)
Cutting Modes	Continuous	Continuous
Nozzle Size / Delivery Angle	.015" / 120°	.015" / 120°
Low Powder Indicator	No	No
Trouble Indicator	No	No
Source-Air Filtering	Yes; oil & moisture	Yes; oil & moisture
Built-In Auxiliary Suction	No; Optional external vacuum system (CFM value not available)	No; Optional external vacuum system (CFM value not available)
Size & Weight	13"H x 9"W x 18" D 29	13"H x 9"W x 18" D 32 lbs
Level	Not Applicable	
Training Available	Video & operational instructions	
Electrical	120v and 240v	
Comments	Low-tech appearance Optional external vacuum system available (Retail: \$1505, Govt:	High-tech attractive appearance. Membrane touch controls facilitate infection control. Optional external vacuum system available (Retail: Govt: \$1505)

Data in this table was provided by manufacturers

Synopsis of Air Abrasion Units

Product Name	KCP 100 Whisperjet American Dental Technologies 28411 Northwestern Highway Southfield, MI 48034 (800) 359-1959	KCP 1000 American Dental Technologies 28411 Northwestern Highway Southfield, MI 48034 (800) 359-1959
Price	Retail: \$12,900.00	Retail: \$16,395.00 Govt: \$16,395.00
	Portable unit on wheels	Portable unit on wheels
	Dental office air with built-in air-booster	Built-in 0.6HP compressor
	27μ μ	27 & 50μ
Switchable	Dual / Yes	
Autoclavable Handpiece / Tips		Yes
Pressure Range		(40, 80, 100, 120, 140, 160
Adjustable Powder Flow		No (constant 4.5 gm/min)
Cutting Modes		Continuous
Nozzle Size / Delivery	.015" / 120°	
Low Powder Indicator	No	
Trouble Indicator	No	
Source-Air Filtering	Yes; oil & moisture	
Built-In Auxiliary Suction		No; Optional external vacuum system ((CFM value not available)
Size & Weight	29"H x 8"W x 17" D 56 lbs	29"H x 8"W x 17" D 91
Compressor Noise Level		Information not provided
Training Available	In-office ½ day training; video & operational instructions	In-office ½ day training; video & operational instructions
Electrical	120v and 240v	120v and 240v
Comments	High-tech attractive appearance. Membrane touch controls facilitate infection control. Optional external vacuum system available (Retail: \$1505, Govt: \$1505)	High-tech attractive appearance. Membrane touch controls facilitate infection control. Optional external vacuum system available (Retail: \$1505, Govt: \$1505)

Data in this table was provided by manufacturers

Synopsis of Air Abrasion Units

Product Name	Mach 5.0	Mach 5.0 Plus
Manufacturer	Kreativ, Inc. 1517 Industrial Way, SW Albany, OR 97321 (800) 573-2858 (541) 924-2479 FAX	Kreativ, Inc. 1517 Industrial Way, SW Albany, OR 97321 (800) 573-2858 (541) 924-2479 FAX
Price	Retail: \$13,500.00 Govt: \$13,500.00	Retail: \$18,500.00 Govt: \$18,500.00
Delivery System	Counter-top	Portable, self-contained unit on wheels
Air Source	Dental office air	Built-in 0.6 HP oil-less compressor
Particle Size	27μ , 27.5μ, 34μ , 50μ	27μ , 27.5μ, 34μ , 50μ
Powder Canisters / Switchable	Single / No	Single / No
Autoclavable Handpiece / Tips	Yes	Yes
Pressure Range	(0 – 125 psi) continuous adjustment	(0 – 120 psi) continuous adjustment
Adjustable Powder Flow	Yes; (0 to 8 gm/min in 0.1 gm increments)	Yes; (0 to 8 gm/min in 0.1 gm increments)
Cutting Modes	Continuous, Micropulse, Powerpulse	Continuous, Micropulse, Powerpulse
Nozzle Size / Delivery Angle	.011" .014" .018" .026" .032" / 45° 67° 90°	.011" .014" .018" .026" .032" / 45° 67° 90°
Low Powder Indicator	Yes	Yes
Trouble Indicator	Yes	Yes
Source-Air Filtering	Yes; oil & moisture; Additional optional air filter available	Yes; Four-stage filtration system
Built-In Auxiliary Suction	No; Optional External KleenAir II Vacuum available (80-120 CFM)	No; Optional External KleenAir II Vacuum available (80-120 CFM)
Size & Weight	14.75"H x 9"W x 18" D; 30 lbs	28.5"H x 9"W x 18" D; 85 lbs
Compressor Noise Level	Not Applicable	75 decibels @ six feet
Training Available	Yes; Clinical seminars (transportation at buyer's expense) and salesman in-office instruction on operation and maintenance	Yes; Clinical seminars (transportation at buyer's expense) and salesman in-office instruction on operation and maintenance
Electrical	120v and 240v; UL and IEC-601-1	120v and 240v; UL and IEC-601-1
Comments	Hi-tech appearance. Membrane touch controls facilitate infection control. Remote control panel can be mounted on dental unit. Air pressure dependent on maximum office pressure obtainable, generally only 80 psi. Optional external KleenAir II vacuum available for \$2495 retail and govt.	Hi-tech appearance. Membrane touch controls facilitate infection control. Remote control panel can be mounted on dental unit. Optional external KleenAir II vacuum available for \$2495 retail and govt.

Data in this table was provided by manufacturers

Synopsis of Air Abrasion Units

Product Name	Lares Associate +	Lares Director +
Manufacturer	Lares Research 295 Lockheed Avenue Chico CA 95973 (800) 347-3289 (916) 345-1870 FAX	Lares Research 295 Lockheed Avenue Chico CA 95973 (800) 347-3289 (916) 345-1870 FAX
Price	Retail: \$8495.00 Govt: \$7221.00	Retail: \$14,995.00 Govt: \$12,595.00
Delivery System	Counter-top	Portable unit on wheels
Air Source	Dental office air (60 psi minimum required); can be supplemented with optional MicroPrep AireBooster or replaced with optional QuikAire Compressor	Built-in 1/2 HP oil-less compressor
Particle Size	27μ	27μ
Powder Canisters / Switchable	Single / No	Single / No
Autoclavable Handpiece / Tips	Yes	Yes
Pressure Range	60, 80, or 120 psi	40 psi, 60 psi, 80-110 psi (in 5 psi increments), 120 psi
Adjustable Powder Flow	Yes; Low (5 gm/min), High (9 gm/min), or Air only	Yes; (5, 7, 9 gm/min) or Air only
Cutting Modes	Continuous	Continuous or Pulsed
Nozzle Size / Delivery Angle	.015" .019" .026" / 45° 80° 90° 120°	.015" .019" .026" / 45° 80° 90° 120°
Low Powder Indicator	No	Yes
Trouble Indicator	No	No
Source-Air Filtering	Yes; oil & moisture	Yes; oil & moisture
Built-In Auxiliary Suction	No; Optional External QuikEvac (97 CFM @ 2 inches)	No; Optional External QuikEvac (97 CFM @ 2 inches)
Size & Weight	10"H x 8"W x 14.5" D 18 lbs	35.5"H x 9.5"W x 14" D 90 lbs
Compressor Noise Level	Not Applicable	Information not provided
Training Available	Detailed training manual. Regional seminars available @ small charge	Detailed training manual. Regional seminars available @ small charge
Electrical	Not Applicable	120v and 240v / IEC 601-1 certified; CSA certification pending
Comments	Clean, high-tech appearance; membrane touch controls facilitate infection control. Air pressure dependent on office air pressure obtainable, generally only 80 psi unless optional air compressor or air booster utilized. Optional QuikAire Oilless Compressor (Retail: \$1449, Govt: \$1232); Optional AireBooster (Retail: \$975, Govt: \$829); Optional External QuikEvac Evacuator (Retail: \$1449, Govt: \$1232)	Hi-tech appearance. Membrane touch controls facilitate infection control. Optional External QuikEvac Evacuator can be included and increases Director+ price to (Retail: \$15,995, Govt: \$13,595)

Data in this table was provided by manufacturers

Synopsis of Air Abrasion Units

Page 7 of 7

Product Name	Lares Producer +	Micadent
Manufacturer	Lares Research 295 Lockheed Avenue Chico CA 95973 (800) 347-3289 (916) 345-1870 FAX	Medidenta International, Inc. 39-23 62 nd Street Woodside NY 11377 (800) 221-0750 (718) 565-6208 FAX
Price	Retail: \$3999.00 Govt: \$3399.00	Retail: \$995.00 Govt: \$995.00
Delivery System	Counter-top	Counter-top
Air Source	Dental office air (60 psi minimum required); can be supplemented with optional MicroPrep AireBooster or replaced with optional QuikAire Compressor	Nitrogen Tank
Particle Size	27 μ	25 μ
Powder Canisters / Switchable	Single / No	Single / No
Autoclavable Handpiece / Tips	Yes	Yes
Pressure Range	60, 80, or 120 psi	(40 – 160 psi)
Adjustable Powder Flow	Yes; Continuous adjustment from 3 gm/min to 10 gm/min	No manual adjustment; automatically increases powder with increased air pressure.
Cutting Modes	Continuous	Continuous
Nozzle Size / Delivery Angle	.015" .019" .026" / 45° 80° 90° 120°	.014" .016" .018" .020" / 120°
Low Powder Indicator	Yes	No
Trouble Indicator	No	No
Source-Air Filtering	Yes; oil & moisture	No, uses inert nitrogen gas
Built-In Auxiliary Suction	No; Optional External QuikEvac (97 CFM @ 2 inches)	No
Size & Weight	10"H x 8"W x 14.5" D 16.6 lbs	4.5"H x 3.4"W x 3" D; 4 lbs
Compressor Noise Level	Not Applicable	Not Applicable
Training Available	Detailed training manual. Regional seminars available @ small charge	Videocassette and instructional text. Regional seminars available (\$195)
Electrical	IEC 601-1 and CSA pending	Not Applicable
Comments	Low-tech yet clean and attractive appearance. Mechanical controls with LED psi display. Air pressure dependent on office air pressure obtainable, generally only 80 psi unless optional air compressor or air booster utilized. Optional QuikAire Oilless Compressor (Retail: \$1449, Govt: \$1232); Optional AireBooster (Retail: \$975, Govt: \$829); Optional External QuikEvac Evacuator (Retail: \$1449, Govt: \$1232)	Low-tech appearance; analog gauges and mechanical switches. Price quoted includes Micadent unit, foot control, one handpiece and tip, and two lbs of powder. Additional costs: Additional handle and tip @ \$99 each, Nitrogen tank @ \$199, Transfer hose and quick-disconnects @ \$144.

Data in this table was provided by manufacturers

Synopsis of Auto Cure Resin Luting Agents* Page 1 of 5

Product	C & B Metabond	Vivaglass Cem	C & B Natural with Fluoride	C & B Natural	C & B Opaque
Company	Parkell Products PO Box 376 Farmingdale NY 11735 (800) 243-7446 	Ivoclar North America 175 Pineview Drive Amherst NY 14228 (800) 533-6825	Bisco Dental 1100 W Irving Park Road Schaumburg IL 60193-3569 (800) 247-3368	Bisco Dental 1100 W Irving Park Road Schaumburg IL 60193-3569 (800) 247-3368	Bisco Dental 1100 W Irving Park Road Schaumburg IL 60193-3569 (800) 247-3368
Radiopaque	No	Yes	Yes	Yes	Yes
Number of Shades	1	1	1	1	1
Cost per application	\$2.94	\$0.90	\$0.49	\$0.39	\$0.39
Applications per kit	85-95	25 (each will cement 1-2 units)	50	50	50
Cost (Gov't)	\$250.00	\$23.00	\$20.48	\$19.48	\$19.48
Number of Tints	0	0	0	0	0
Number of Opaquers	0	0	0	0	0
Filled by weight		86%	55%	55%	55%
Filled by Volume					
Particle size range			3-5 µm	3-5 µm	3-5 µm
Film thickness	15-35 µm	25 µm	30 µm	30 µm	30 µm
Contains Flouride	No	Yes	Yes	No	No
Dentin Bonding Agent Included	Acts as own DBA	No	No	No	No

* Data in this table was provided by the manufacturers.

Synopsis of Auto Cure Resin Luting Agents (Cont'd)* Page 2 of 5

Product	Cement-It	Chemlock	Panavia 21	ScotchBond Resin Cement
Company	Jeneric/Pentron Inc 53 North Plains Industrial Road Wallingford CT 06492 (800) 243-3100	RoyDent Dental Products 1010 W. Hamlin Road Rochester Hills MI 48309 (800) 992-7767	J. Morita USA 14712 Bentley Circle Tustin CA 92780 (714) 544-2854 (800) 752-9729	3M Dental Products BLDG 275-25E-03 St Paul MN 55144-1000 (800) 451-5761 Ext 1
Radiopaque	Yes	Yes	Yes	Yes
Number of Shades	1	1	3 (only one per kit)	1
Cost per application		\$1.53		\$2.20
Applications per kit		60		23
Cost (Gov't)	\$31.49	\$91.60	\$165.00	\$50.65
Number of Tints	0	0	0	0
Number of Opaquers	0	0	0	0
Filled by weight	68%	64%	77%	Paste A 77% Paste B 80%
Filled by Volume				Paste A 56% Paste B 60%
Particle size range	.01-5 µm	.02-.07 µm		1.1-1.8 µm
Film thickness	< 21µm	23 µm	19 µm	11.5 µm
Contains Flouride	Yes	Yes	No	No
Dentin Bonding Agent Included	Meta/Bond	R-Bond	ED Primer	ScotchBond Multipurpose Plus

* Data in this table was provided by the manufacturers.

Product	Nexus	DuoLink	Choice	Geristore	Adherence
Company	Kerr 1717 West Collins Ave Orange CA 92667 (800) 537-7123	Bisco Dental 1100 W Irving Park Road Schaumburg IL 60193-3569 (800) 247-3368	Bisco Dental 1100 W Irving Park Road Schaumburg IL 60193-3569 (800) 247-3368	Den-Mat Corporation PO Box 1729 Santa Maria CA 93456 (800) 445-0345	Septodont Inc 245 C Quigley Blvd New Castle DE 19720 (800) 872-8305
Radiopaque	Yes	Yes	Yes	Yes	Yes
Number of Shades	3	1	10 (full kit)	6	4
Applications per kit	NA	50	80-100		80
Cost (Gov't)	\$119.00	\$21.00	\$71.60	\$154.00	\$126.75
Cost per application		\$0.40	\$0.71-\$0.89		\$1.58
Contains Fluoride	Yes	No	No	Yes	Yes
Tints	0	0	8		4
Opaquers	0	0	2		0
Filler by weight	70-72%	67%	80%	70%	64%
Filler by Volume	50-52%			60%	41%
Particle size range	.04-1.5µm	0.7-0.8 µm	1-5 µm	0.03-4 µm	0.04-12 µm
Film thickness	10-15µm	25 µm	30 µm	12 µm	30 µm
Try in Pastes	3	0	5-10	0	4
Dentin Bonding Agent Included	Nexus Adhesive System	No	No	No	Confi-bond
Other (Included)	Silane, applicator tips, mixing pads	Mixing pads, spatulas	Mixing pads, spatula		Etch, resin, dispensing accessories

* Data in this table was provided by the manufacturers.

Dual Cure Resin Luting Agents (Cont'd)*

Product	Permalute	Infinity Bond	2 Bond 2	Opal Luting Cement	VarioLink II
Company	Ultradent Products Inc 505W 10200 South South Jordan UT 84065 (800) 793-5216	Den-Mat Corporation PO Box 1729 Santa Maria CA 93456 (800) 445-0345	JF Jelenko 99 Business Park Drive Armonk NY 10504 (800) 431-1785	3M Dental Products BLDG 275-25E-03 St Paul MN 55144-1000 (800) 451-5761 Ext 1	Ivoclar North America 175 Pineview Drive Amherst NY 14228 (800) 533-6825
Radiopaque	Yes	Yes	Yes	Yes	Yes
Number of Shades	6	1	4	7	5
Applications per kit					75-100
Cost (Gov't)	\$306.85	\$171.60	\$147.00	\$149.70	\$135.00
Cost per application					\$1.00-\$1.50
Contains Fluoride	Yes	Yes	Yes	No	Yes
Tints	0	0	2	0	0
Opaquers	0	0	0	0	1
Filler by weight	70%	60%	41%	Paste A 84% Paste B 80%	75%
Filler by Volume	43%	52%			
Particle size range		0.03-4 µm	0.02-1 µm	1.1-1.8 µm	0.5-3 µm
Film thickness	9 µm	2 µm		11 µm	22 µm
Try in Pastes	6	0		7	5
Dentin Bonding Agent Included	Permalute Bonding	No	No	No	Syntac
Other (Included)	Spatulas, mixing pads, brushes	Dry Bond	Artglass liquid	Finishing strips, polishing pastes, syringes	Heliobond, monobond, etch, liquid strip, pads, brushes

* Data in this table was provided by the manufacturers.

Dual Cure Resin Luting Agents (Cont'd)*

Product	Enforce Sure Cure	Resin X	V-Bond
Company	Dentsply Caulk PO Box 359 Milford DE 19963 (800) 532 2855	Temrex Corporation PO Box 182 112 Albany Avenue Freeport NY (800) 645-1226	Temrex Corporation PO Box 182 112 Albany Avenue Freeport NY (800) 645-1226
Radiopaque	Yes	With adequate depth	With adequate depth
Number of Shades	6	8	3
Applications per kit	20	25	50
Cost (Gov't)	\$96.73	\$27.95	\$70.70
Cost per application	\$4.81	\$1.11	\$1.41
Contains Fluoride	Yes		
Tints	0	0	0
Opaquers	2	1	1
Filler by weight		52%	52%
Filler by Volume		38%	38%
Particle size range		.06-7 µm	.06-7 µm
Film thickness	21µm		
Try in Pastes	Available separately		
Dentin Bonding Agent Included	Prime & Bond 2.1	No	No
Other (Included)	Etch brushes mixing well		Etch silane

* Data in this table was provided by the manufacturers.

Synopsis of Dental X-Ray Chairs* Page 1 of 2



Company	Boyd Industries Inc 12275 75 th St. N Largo, FL 34643 (800) 255-2693	Boyd Industries Inc 12275 75 th St. N Largo, FL 34643 (800) 255-2693	Boyd Industries Inc 12275 75 th St. N Largo, FL 34643 (800) 255-2693	Boyd Industries Inc 12275 75 th St. N Largo, FL 34643 (800) 255-2693
Model	E-505 (electric)	E-505 (manual)	E-520 (manual)	E-525 (electric)
Pricing	\$2,300.00 (retail) \$1,738.65 (gov't)	\$1,875.65 (retail) \$1,470.65 (gov't)	\$2,280.00 (retail) \$1,700.00 (gov't)	\$4,565.00 (retail) \$3,424.00 (gov't)
Government Contract	VA Contract V797P-3019K	VA Contract V797P-3019K	VA Contract V797P-3019K	VA Contract V797P-3019K
Volts	120	N/A	N/A	120
Amperes	6.25	N/A	N/A	8
Height Adjustment	22"-30"	23"-30"	19"-26"	19"-26"
Base Width	24"	24"	24"	24"
Upholstery	Naugahyde	Naugahyde	Naugahyde	Naugahyde

* The data in this table was provided by the manufacturers.

Company	The Brewer Co. 13901 Main St. PO Box 159 Menomonee, WI 535051 (800) 558-8777	The Brewer Co. 13901 Main St. PO Box 159 Menomonee, WI 535051 (800) 558-8777	Reliance 96 Caldwell Drive Cincinnati, OH 45216 (800) 735-0375	Reliance 96 Caldwell Drive Cincinnati, OH 45216 (800) 735-0375
Model	5025 (manual)	5075 (electric)	880-H (electric)	980 (hydraulic)
Pricing	\$2,865.00 (retail) \$2,152.00 (gov't)	\$3,999.00 (retail) \$3,000.00 (gov't)	\$6,025.00 (retail) \$4,137.77 (gov't)	\$5,895.00 (retail) \$4,061.81 (gov't)
Government Contract	No	No	VA Contract V797P-3472J	VA Contract V797P-3472J
Volts	N/A	120	115	115
Amperes	N/A	8	8	8
Height Adjustment	21"-29"	21"-29"	23"-33"	24"-34"
Base Width	24"	24"	24"	24"
Upholstery	Vinyl	Vinyl	Naugahyde	Naugahyde

* The data in this table was provided by the manufacturers.



Synopsis of Dental X-Ray Chairs* (Cont'd) Page 2 of 2



Company	Reliance 96 Caldwell Drive Cincinnati, OH 45216 (800) 735-0375	Reliance 96 Caldwell Drive Cincinnati, OH 45216 (800) 735-0375	Global Surgical 3610 Tree Court Industrial Blvd St. Louis, MO 63122 (800) 861-3585	Global Surgical 3610 Tree Court Industrial Blvd St. Louis, MO 63122 (800) 861-3585
Model	6200 (hydraulic)	7000 (electric)	Apex 2200 (electric)	Apex 2300 (electric)
Pricing	\$4,440.00 (retail) \$3,073.52 (gov't)	\$5,540.00 (retail) \$3,899.21 (gov't)	\$5,200.00 (retail) \$4,680.00 (gov't)	\$3,900.00 (retail) \$3,510.00 (gov't)
Government Contract	VA Contract V797P-3472J	VA Contract V797P-3472J	No	No
Volts	115	115	110	110
Amperes	8	8	8	8
Height Adjustment	22"-34"	22"-34"	24"-34"	22"-34"
Base Width	24"	24"	24"	24"
Upholstery	Naugahyde	Naugahyde	Naugahyde	Naugahyde

* The data in this table was provided by the manufacturers.

Company	Global Surgical 3610 Tree Court Industrial Blvd St. Louis, MO 63122 (800) 861-3585	Global Surgical 3610 Tree Court Industrial Blvd St. Louis, MO 63122 (800) 861-3585
Model	Apex 2400 (electric)	Apex 2500 (manual)
Pricing	\$2,900.00 (retail) \$2,610.00 (gov't)	\$2,275.00 (retail) \$2,047.50 (gov't)
Government Contract	No	No
Volts	110	N/A
Amperes	8	N/A
Height Adjustment	22"-34"	25"-33"
Base Width	24"	24"
Upholstery	Naugahyde	Naugahyde

* The data in this table was provided by the manufacturers.



Synopsis of Direct Placement Composites Page 1 of 8

Product	Aelitefil	Bisfil P	Bisfil II	Bisfil 2B
Manufacturer	Bisco Dental Products 1100 West Irving Park Rd Schaumburg, IL 60193 Phone: 800-247-3368 Fax: 800 959-9550	Bisco Dental Products 1100 West Irving Park Rd Schaumburg, IL 60193 Phone: 800-247-3368 Fax: 800 959-9550	Bisco Dental Products 1100 West Irving Park Rd Schaumburg, IL 60193 Phone: 800-247-3368 Fax: 800 959-9550	Bisco Dental Products 1100 West Irving Park Rd Schaumburg, IL 60193 Phone: 800-247-3368 Fax: 800 959-9550
Composite Type (Hybrid, Microfill, Flowable, etc)	Hybrid	Hybrid	Base Increment Composite	Base Increment Composite
Recommended Uses	Class 1,2,3,4,5; Porcelain/Metal Repair	Class 1,2,3	Dentin replacement composite-condensable (directed shrinkage technique)	Dentin replacement composite-syringable (directed shrinkage technique)
Kit Contents	5x5gm syringes (A1,2,3.5; C2; D3)	available as individual syringes only: 4.5g, shades Light and Universal	available as individual syringes only: 5g, universal shade only	1x5g syringe base, 1x5g syringe catalyst
Recommended Dentin Bonding System	All-Bond 2 or One-Step			
Shade Guide	Vita	Vita	Vita	Vita
Number of Shades Available	10 Vita shades plus Opaque white & translucent (incisal)	2 shades	1 Shade	1 Shade
Resin Components	Bis-GMA, UDMA	Ethoxy bisphenol dimethacrylate	Bis-GMA	Bis-GMA
Filler Type	Submicron silicon dioxide, Barium glass	Strontium glass, amorphous silica	Strontium glass, amorphous silica	Strontium glass, amorphous silica
Filler Particle Size Range/Avg Size	0.7-0.7um/0.7um	0.04-5um/3-5um	3-5um	2-3um
Percent Filler (Wt/Vol)	80 Wt%/65 Vol%	86 Wt%/74 Vol%	80 Wt%	75 Wt%
Polymerization Shrinkage	2.1 Vol%	1.6 Vol%	2.15 Vol%	2.15 Vol%
Method of Activation	Visible Light Cure	Visible Light Cure	Auto-cure	Auto-cure
Contains Fluoride	No	No	No	No
Radiopaque	Yes	Yes	Yes	Yes
MSDS Provided	Yes	Yes	Yes	Yes
Retail/Govt Price	\$28.60/\$23.85	\$26.50/22.52	\$51.60/43.73	\$49.50/41.95

Data in this table is provided by manufacturers.

Synopsis of Direct Placement Composites Page 2 of 8

Product	Glacier	Clearfil AP-X	True Vitality	Solitaire
Manufacturer	Southern Dental Industries 246 First Street, Suite 204 San Francisco, CA 94105 Phone: 800-228-5166 Fax: 415-975-8065	J. Morita USA Inc 14712 Bentley Circle Tustin, CA 92780 Phone: 800-752-9720 Fax 714-730-0783	Den-Mat Corporation 2727 Skyway Drive Santa Maria, CA 93455 Phone: 800-433-6628 Comm: 805-922-8491 Fax: 805-922-6933	Heraeus Kulzer Inc 4315 S. Lafayette Blvd South Bend, IN 46614 Phone: 800-343-5336 Comm: 219-291-0661 Fax: 800-522-1545
Composite Type (Hybrid, Microfill, Flowable, etc)	"Condensible" Hybrid	Hybrid	Hybrid	"Condensible" Hybrid
Recommended Uses	Class 1,2,3,4,5	Class 1,2,3,4,5	Class 1,2,3,4,5; Indirect heat-cured inlays, onlays, crowns, laminates; Temporary crowns and FPD's	Class 1,2,5; Core build-up
Kit Contents	10x4g syringes (Enamel:A1,2,3,3.5, B1,3, C2; Dentin: OB4, OC4, OD3), 1x4g polishing paste, 1x2ml gel etchant, 1x5ml PAAMA 2 primer, 1x5ml PAAMA 2 adhesive, 2 brush handles, disposable brush tips & etchant tips (SDI also has an intro kit with 60x0.25g complets in shades A2,3,3.5; B4; C4; D3)	4x4.6g syringes (eXtra Light, A2,3.5, Cervical Light)	6x2.75g syringes (shades A1,2,3.5; B1,2; D4), 4g TV cement A&B, 3ml etch, 3g Tenure S, 10 ml Dry Bond, 1.5ml Tenure Conditioner, 1.5ml Tenure A&B, 11g I/C initiator paste, 8g TV release agent, 2 brush handles, 2x5pc Centrix clear tip/plug, mixing pad, spatulat, 100 pc brush tip kit, Dab-eze, Rembrandt toothpaste	6x3gm syringes (A10,20,30; B20,30, incisal) 2x2.5ml Esticid etchant, 1x4ml Solid Bond primer, 2x2ml Solid Bond sealant, brush handle, disposable brushes & tips
Recommended Dentin Bonding System	PAAMA 2	Liner Bond 2, Liner Bond 2V	Tenure A/B Multi-Purpose Bonding System, Tenure Quik with Fluoride	Solid Bond
Shade Guide	Vita	Vita	Vita	Vita (A10=A1, A35=A3.5, etc)
Number of Shades Available	13 Enamel, 8 Dentin	11 Vita shades plus CL, XL, Hollywood Opaque	12 Vita shades	6 Vita shades
Resin Components	70% UDMA, 30% DDMA	Bis-GMA, TEGDMA	Bis-GMA/TEGDMA	Polyglas multi-functional (proprietary)
Filler Type	Strontium Glass, amorphous silica	colloidal silica, Barium glass	Barium-fluoro-silicate glass/colloidal silica	Porous silica dioxide, Ba-Al-Bo-F-So glass
Filler Particle Size Range/Avg Size	0.04-1um/0.04um	<0.1-10um/0.3um	0.02-3.5um/1.0um	2-20um/NA
Percent Filler (Wt/Vol)	78 Wt%/62 Vol%	85.5 Wt%/70 Vol%	60 Wt%/52 Vol%	65 Wt%/92 Vol%
Polymerization Shrinkage	1.5 Vol%	1.8 Vol%	1.5 Vol%	Requested, not provided
Method of Activation	Visible Light Cure	Visible Light Cure	Dual Cure	Visible Light Cure
Contains Fluoride	No	No	Yes	Yes (aluminum-fluoride-silica glass)
Radiopaque	Yes	Yes	Yes	Yes
MSDS Provided	Yes	Yes	No (available upon request)	No (available upon request)
Retail/Govt Price	\$346.50/166.32 (\$161.65/\$77.60 for the complet intro kit)	\$144/\$86.40	\$288.28/230.62	\$391/220.90

Data in this table is provided by manufacturers.

Synopsis of Direct Placement Composites Page 3 of 8

Product	Charisma	Charisma F	Durafill	Durafill VS
Manufacturer	Heraeus Kulzer Inc 4315 S. Lafayette Blvd South Bend, IN 46614 Phone: 800-343-5336 Comm: 219-291-0661 Fax: 800-522-1545	Heraeus Kulzer Inc 4315 S. Lafayette Blvd South Bend, IN 46614 Phone: 800-343-5336 Comm: 219-291-0661 Fax: 800-522-1545	Heraeus Kulzer Inc 4315 S. Lafayette Blvd South Bend, IN 46614 Phone: 800-343-5336 Comm: 219-291-0661 Fax: 800-522-1545	Heraeus Kulzer Inc 4315 S. Lafayette Blvd South Bend, IN 46614 Phone: 800-343-5336 Comm: 219-291-0661 Fax: 800-522-1545
Composite Type (Hybrid, Microfill, Flowable, etc)	Universal Hybrid	Universal Hybrid	Microfill	Microfill
Recommended Uses	Class 1,2,3,4,5; inlays, onlays, veneers	Class 1,2,3,4,5; inlays, onlays, veneers	Class 3,4,5	Class 3,4,5
Kit Contents	14x4g syringes (A10,20,30,35; B10,20,30;C20,40; OA20,30,35; OB20 plus incisal and Superlight), 2x4ml Denthesive primer, 2x2ml Denthesive adhesive, 2x2.5ml gel etchant, handles, disposable brushes and etchant tips	8x4g Charisma F cartridges (Enamel: A10,20,30,35; B20; C20; Dentin: OA20; incisal); 2x3g Creative cartridges (CF1 [white]; CF5 [apricot]); 10 Multijet F cartridge holders; 1x4ml Solid Bond P primer; 2x2ml Solid Bond S sealer; 2x2.5ml gel etchant; brush handles; disposable brushes and etchant tips	10x4g syringes (Brown, Gray, Light, Standard, Universal, Brown Opaque, Gray Opaque, Light Opaque, Universal Opaque, YO = brown-yellow)	10x4g syringes (shades A10,20,30,35; B10,20,30; C20,40, plus Incisal)
Recommended Dentin Bonding System	Denthesive	Solid Bond	Solid Bond	Solid Bond
Shade Guide	Vita (OA20="opaque" A2, etc)	Vita	Proprietary	Vita
Number of Shades Available	9 enamel Vita shades, 4 opaque Vita shades, incisal, superlight	6 Enamel, 1 opaque shade, plus incisal and 2 tints	10 proprietary shades	10 Vita shades
Resin Components	Bis-GMA	Bis-GMA/TEGDMA	Bis-GMA	Bis-GMA
Filler Type	Barium-alumino-boro-silicate glass/silicon dioxide	Barium-alumino-fluoro-silicate glass/silicon dioxide	Silicon Dioxide	Silicon dioxide
Filler Particle Size Range/Avg Size	0.7um	0.85um	0.04um	0.04um
Percent Filler (Wt/Vol)	79 Wt%/60 Vol%	80 Wt%/60 Vol%	50.5 Wt%/40 Vol%	50.5 Wt%/40 Vol%
Polymerization Shrinkage	Requested, not provided	Requested, not provided	Requested, not provided	Requested, not provided
Method of Activation	Visible Light Cure	Visible Light Cure	Visible Light Cure	Visible Light Cure
Contains Fluoride	No	Yes	No	No
Radiopaque	Yes	Yes	No	Yes
MSDS Provided	No (available upon request)	No (available upon request)	No (available upon request)	No (available upon request)
Retail/Govt Price	\$494.40/278.85	\$422.35/238.20	\$243.80/137.48	\$243.80/137.48

Data in this table is provided by manufacturers.

Synopsis of Direct Placement Composites Page 4 of 8

Product	Heliomolar	Tetric	Tetric Ceram	Helioprogress
Manufacturer	Ivoclar North America/Vivadent 175 Pineview Drive Amherst, New York 14228 Phone: 800-533-6825 Fax: 716-691-2285	Ivoclar North America/Vivadent 175 Pineview Drive Amherst, New York 14228 Phone: 800-533-6825 Fax: 716-691-2285	Ivoclar North America/Vivadent 175 Pineview Drive Amherst, New York 14228 Phone: 800-533-6825 Fax: 716-691-2285	Ivoclar North America/Vivadent 175 Pineview Drive Amherst, New York 14228 Phone: 800-533-6825 Fax: 716-691-2285
Composite Type (Hybrid, Microfill, Flowable, etc)	Microfill	Micro-hybrid	"Ceromer"	Microfill
Recommended Uses	Class 1,2,3,4,5	Class 1,2,3,4,5	Class 1,2,3,4,5; repair of composite and ceramic veneers	Class 3,4,5
Kit Contents	8x3g syringes (shades 105 [white]; A1,2,3; D3; C3; A1 Translucent; 38 Translucent [facial]), shade guide (composite can also be obtained in 40 cartridges x 0.25g each)	4x4g syringes (shades A2,3,3.5; B3), 3g Syntac primer, 3g Syntac adhesive, 6g Heliobond, 2g etchant (composite also can be obtained in cartridges 0.25g each), brush handle and tips	8x4g syringes (shades A1,2,3,3.5,4; B3; D3; C3), 5g SyntacSC, 2g etchant, shade guide, brush handle, 50 disposable brushes	Single 2.5g syringes only (shades A1,2,4; B3;C3;D3;Brown Grey)
Recommended Dentin Bonding System	Syntac; Syntac SC	Syntac; Syntac SC	Syntac; Syntac SC	Syntac; Syntac SC
Shade Guide	Proprietary, most matched to Vita	Proprietary, most matched to Vita	Proprietary, most matched to Vita	Proprietary, most matched to Vita
Number of Shades Available	8 Vita shades, 2 enamel shades, 1 pedo shade	9 Vita shades, 3 opaque Vita shades, transparent, cervical	9 Vita shades, 3 opaque shades, transparent, white, cervical	6 Vita shades; one proprietary shade
Resin Components	Bis-GMA, UDMA, decanediol DMA	Bis-GMA, UDMA	Bis-GMA, UDMA, TEGDMA	Bis-GMA, UDMA
Filler Type	Fumed Silica, Yterbiutrifluoride, Prepolymerized "organic filler" (20-30um)	Barium glass, Yterbiumtrifluoride, silica, sheroidal mixed oxide (nm sized fillers to control viscosity)	Barium glass, Barium-alumino-fluoro-silicate glass, Yterbiumtrifluoride, silica, sheroidal mixed oxide (nm sized fillers to control viscosity)	Fumed silica, pre-polymerized "organic filler"
Filler Particle Size Range/Avg Size	0.02um-0.06um (fumed silica) 0.7-1.0 um (prepolymerized filler)	0.7-3.0um/1.5um	0.7-3.0um/1.0um	0.02um-0.06um (fumed silica) 0.7-1.0 um (prepolymerized filler)
Percent Filler (Wt/Vol)	76.5 Wt%/64 Vol%	79.5 Wt%/61 Vol%	79 Wt%/63.7 Vol%	73 Wt%/62.8 Vol%
Polymerization Shrinkage	2 Vol%	2 Vol%	2.5 Vol%	2 Vol%
Method of Activation	Visible Light Cure	Visible Light Cure	Visible Light Cure	Visible Light Cure
Contains Fluoride	Yes	Yes	Yes	No
Radiopaque	Yes	Yes	Yes	No
MSDS Provided	Yes	Yes	Yes	Yes
Retail/Govt Price	\$289/98	\$199.99/90	\$345/150	\$45.63/23

Data in this table is provided by manufacturers.

Synopsis of Direct Placement Composites Page 5 of 8

Product	Z100	Silux Plus	P-10	P-50
Manufacturer	3M Dental Products Division 3M Center, Building 275-2SE-03 St Paul, MN 55144-1000 Phone: 800-451-5761, Ext.1 Comm: 612-737-8761 Fax: 800-728-0956	3M Dental Products Division 3M Center, Building 275-2SE-03 St Paul, MN 55144-1000 Phone: 800-451-5761, Ext.1 Comm: 612-737-8761 Fax: 800-728-0956	3M Dental Products Division 3M Center, Building 275-2SE-03 St Paul, MN 55144-1000 Phone: 800-451-5761, Ext.1 Comm: 612-737-8761 Fax: 800-728-0956	3M Dental Products Division 3M Center, Building 275-2SE-03 St Paul, MN 55144-1000 Phone: 800-451-5761, Ext.1 Comm: 612-737-8761 Fax: 800-728-0956
Composite Type (Hybrid, Microfill, Flowable, etc)	Hybrid	Microfill	Macrofill	Macrofill
Recommended Uses	Class 1,2,3,4,5	Class 3,4; Class 1 (premolars); Class 4 (where esthetics important)	Class 1,2	Class 1,2
Kit Contents	60 compulesx0.20g each (shades A2,3,4; B3; C2; D3) Scotchbond Multi-Purpose (3ml gel etchant, 4 ml primer, 4ml adhesive, 3 well dispenser), pad, shade guide, 3 brush handles, brush tips,	8x3g syringes (enamel shades: <u>L</u> ight, <u>U</u> niversal, <u>I</u> ncisal; opaque/dentin shades: <u>U</u> niversal <u>O</u> paque, <u>Y</u> ellow <u>O</u> paque, <u>D</u> ark <u>Y</u> ellow <u>O</u> paque, <u>G</u> ray <u>O</u> paque, <u>D</u> ark <u>G</u> ray <u>O</u> paque), Scotchbond Multi-Purpose (3ml etchant, 4ml primer, 4ml adhesive, 25 etchant tips, 3 well dispenser), shade guide, pad, 3 brush handles, brush tips	20g each paste A & B, mixing pads, spatulas	Individual syringes (shades: Universal, Yellow, Gray, Extra Light)
Recommended Dentin Bonding System	Scotchbond Multi-Purpose, Single Bond	Scotchbond Multi-Purpose, Single Bond	Scotchbond Multi-Purpose, Single Bond	Scotchbond Multi-Purpose, Single Bond
Shade Guide	Vita	Proprietary	No	Yes
Number of Shades Available	10 Vita shades, Universal dentin, Incisal, Pedo, Cervical Gray, Cervical Yellow	9 translucent/enamel shades, 7 opaque/dentin shades	1 shade (Universal)	4 shades
Resin Components	Bis-GMA/TEGDMA	Bis-GMA/TEGDMA	Bis-GMA/TEGDMA	Bis-GMA/TEGDMA
Filler Type	Zirconia, Silica	Colloidal silica, "organic" filler (pre-polymerized microfiller blocks)	Quartz	Zirconia Silica
Filler Particle Size Range/Avg Size	0.01-3.5um/0.6um	0.01-0.09um/0.04um	0.3-20um/3.0um	0.2-6um/1.5um
Percent Filler (Wt/Vol)	84.5 Wt%/66 Vol%	56 Wt%/40 Vol%	86 Wt%/74 Vol%	87.5 Wt%/77 Vol%
Polymerization Shrinkage	2.6 Vol%	3 Vol%	2 Vol%	2 Vol%
Method of Activation	Visible Light Cure	Visible Light Cure	Self Cure	Visible Light Cure
Contains Fluoride	No	No	No	No
Radiopaque	Yes	No	No	Yes
MSDS Provided	Yes	Yes	Yes	Yes
Retail/Govt Price	\$285.20/157.76	\$270.85/149.24	\$401.50/190.64	\$65.50/31.13

Data in this table is provided by manufacturers.

Synopsis of Direct Placement Composites Page 6 of 8

Product	Restolux SP2	Restolux SP4	TPH	Solitaire
Manufacturer	Lee Pharmaceuticals 1434 Santa Anita Avenue South El Monte, CA 91733 Phone 800-950-5337 Comm: 626-442-3141 Fax: 626-443-1561	Lee Pharmaceuticals 1434 Santa Anita Avenue South El Monte, CA 91733 Phone 800-950-5337 Comm: 626-442-3141 Fax: 626-443-1561	L.D. Caulk Division 38 West Clarke Ave P.O. Box 359 Milford, DE 19963-0359 Phone: 800 LD CAULK Comm: 302-422-4511 Fax: 800-788-4110	L.D. Caulk Division 38 West Clarke Ave P.O. Box 359 Milford, DE 19963-0359 Phone: 800 LD CAULK Comm: 302-422-4511
Composite Type (Hybrid, Microfill, Flowable, etc)	Hybrid	Hybrid	Hybrid	"Condensable" Hybrid
Recommended Uses	Class 3,4,5	Class 1,2	Class 1,2,3,4,5	Class 1, 2 (direct or indirect)
Kit Contents	5x5g syringes (or 65x0.5g preloaded tips) (shades Light, Universal, Light Universal, Yellow, Dark Universal), 1.3g opaquer, 3ml unfilled resin, 3ml Restobond 3 sealer, 3ml Restobond 3 conditioner, 36 Beta Quartz inserts, brushes, mixing pads, mixing dishes, dispensing syringe, dispensing needles, shade guide	18x1g capsules (or 50x0.33g preloaded tips)(one shade: universal), 3 ml unfilled resin, 3ml Restobond 3 sealer, 3ml Restobond 3 conditioner, 36 Beta Quartz inserts, mixing pads, mixing dishes, dispensing syringe, dispensing needles, brush handle and tips	100 compulesx0.25g each (shades A1,2,3,3.5,4; B1,2,3; C1,2,3,4; D3; plus Bleach White,White, XL=Extra White, Dark Yellow, eXtra Gray Brown, Gray Brown, B1-Incisal, C2-Opaque), gel etchant, 4.5ml Prime & Bond 2.1, shade guide, compule gun	30 blister packsx2/3 "spill" each (shades A=between A1&A2, B=lighter than B1, C=lighter than C1), non-stick amalgam carrier , 4.5ml Prime & Bond 2.1, 3ml etchant, disposable syringe tips, brush handle, disposable brush tips, pad, dispensing well.
Recommended Dentin Bonding System	Restobond 3	Restobond 3	Prime & Bond 2.1	Prime & Bond 2.1
Shade Guide	Proprietary (manufacturer offers corresponding Vita/Trubyte shade conversion)	No	Vita	Proprietary
Number of Shades Available	5 shades	1 shade	13 Vita shades, 6 proprietary supplementary shades	3 proprietary shades
Resin Components	Bis-GMA/TEGDMA	Bis-GMA/TEGDMA	Bis-GMA, Bis-EMA, ethoxylated BisA-DMA, TEGDMA	Urethane modified Bis-GMA
Filler Type	Barium glass/silica microfiller	Barium glass/silica microfiller	Barium-alumino-boro-silicate glass/fumed silica	Barium boron fluoroalumino silicate glass, silica
Filler Particle Size Range/Avg Size	0.2-10um/4um	0.2-10um/4um	<0.8um/0.04-3um	0.8um/
Percent Filler (Wt/Vol)	79 Wt%/81.2 Vol%	85 Wt%/84 Vol%	77.5 Wt%/57.1 Vol%	81.5 Wt%/65 Vol%
Polymerization Shrinkage	Not available	0.8 Vol%	3 Vol%	2 Vol%
Method of Activation	Visible Light Cure	Visible Light Cure	Visible Light Cure	Visible Light Cure
Contains Fluoride	No	No	No	Yes
Radiopaque	Yes	Yes	Yes	Yes
MSDS Provided	No (available upon request)	No (available upon request)	Yes	Yes
Retail/Govt Price	\$299/179.40	\$299/179.40	\$400/220	\$195/107.25

Data in this table is provided by manufacturers.

Synopsis of Direct Placement Composites Page 7 of 8

Product	Herculite XRV	Prodigy	CR-Hybrid
Manufacturer	Kerr 1717 West Collins Avenue Orange, CA 92867 Phone: 800-537-7123 Comm: 714-516-7617 Fax: 714-516-7633	Kerr 1717 West Collins Avenue Orange, CA 92867 Phone: 800-537-7123 Comm: 714-516-7617 Fax: 714-516-7633	Centrix, Incorporated 770 River Road Shelton, Connecticut 06484 Phone: 800-235-5862 Fax: 888-236-8749
Composite Type (Hybrid, Microfill, Flowable, etc)	Hybrid	Hybrid	Hybrid
Recommended Uses	Class 1,2,3,4,5	Class 1,2,3,4,5	Class 1,2
Kit Contents	Esthetic Kit: 27x4g syringes (enamel shades A1,2,3,3.5,4; B1,2,3,4; C1,2,3,4; D2,3,4; dentin shades A2,3,3.5; B1,2; C2; D3; incisal shades light, medium; opaque shade A 3.5; plus extra light), gel etchant, Optibond FL, applicator tips (composite can also be obtained in unidose tips, 20 tips=4g)	5x4g syringes (shades A2,3; B1; C2; D2) Optibond FL, gel etchant, Optiguard composite surface sealant, applicator tips (composite can also be obtained in unidose tips, 20 tips=4g)	25g jar CR Hybrid base, 25g jar CR base (Vita shade 3.5), spatulas, mixing pads
Recommended Dentin Bonding System	Optibond FL, Optibond Solo	Optibond FL, Optibond Solo	Encore Bond
Shade Guide	Vita	Vita	Vita
Number of Shades Available	16 Vita enamel shades, 7 Vita dentin shades, 2 incisal shades, 1 opaque shade, extra light	16 Vita enamel shades, 7 Vita dentin shades, 2 incisal shades, 1 opaque shade, extra light	1 Vita shade
Resin Components	Bis-GMA/TEGDMA	ethoxylated Bis-GMA/TEGDMA	Bis-GMA/TEGDMA
Filler Type	Barium-alumino-boro-silicate glass, colloidal silica	Barium-alumino-boro-silicate glass, colloidal silica	Quartz, Barium glass, silicon dioxide
Filler Particle Size Range/Avg Size	0.04-1.5um/0.6um	0.04-1.5um/0.6um	0.7-44um/1um
Percent Filler (Wt/Vol)	79 Wt%/59 Vol%	79 Wt%/59 Vol%	78 Wt%/80 Vol%
Polymerization Shrinkage	3 Vol%	3 Vol%	1.5-2.5 Vol%
Method of Activation	Visible Light Cure	Visible Light Cure	Self Cure
Contains Fluoride	No	No	No
Radiopaque	No	No	Yes
MSDS Provided	No	No	Yes
Retail/Govt Price	\$878.90/342.97	\$200/85	\$129.95/116.95

Data in this table is provided by manufacturers.

Synopsis of Direct Placement Composites Page 8 of 8

Product	Amelogen Microfill	Amelogen Universal	Vitaescence
Manufacturer	Ultradent Products, Inc. 505 West 10200 South South Jordan, Utah 84095 Phone: 800-793-5216 Comm: 801-553-4133 Fax: 801-572-0600	Ultradent Products, Inc. 505 West 10200 South South Jordan, Utah 84095 Phone: 800-793-5216 Comm: 801-553-4133 Fax: 801-572-0600	Ultradent Products, Inc. 505 West 10200 South South Jordan, Utah 84095 Phone: 800-793-5216 Comm: 801-553-4133 Fax: 801-572-0600
Composite Type (Hybrid, Microfill, Flowable, etc)	Microfill	Hybrid	Hybrid
Recommended Uses	Class 3,4(labial surface veneer),5, direct placement veneers, porcelain/metal repair	Class 1,2,3,4,5, direct placement veneers, porcelain/metal repair	Class 1,2,3,4,5, direct placement veneers, porcelain/metal repair
Kit Contents	12x2.5g syringes (shades A1,2,3,3.5; B1,2,3; C1,2,4; D3; Incisal)	Expanded kit: 15x2.5g syringes (coronal shades: A1,2,3,3.5; B1,2,3; C2; A2,3,3.5 Qpaque; Incisal; root shades: C4 in 3 hues B/Y/G)	Masters kit: 26x2.5g syringes (dentin shades: A1,2,3,3.5,4,5,6; B1,2,3,4,5; C1,2,3,4,5; D3; enamel shades: Pearl frost & snow; Trans gray, ice, mist, smoke, yellow & amber)
Recommended Dentin Bonding System	Perma Quick, PQ1	Perma Quick, PQ1	Perma Quick, PQ1
Shade Guide	Vita	Vita/Proprietary	Vita/proprietary
Number of Shades Available	12 (11 Vita; 1 proprietary)	15 (coronal: 11 Vita, 1 proprietary shade; root: 1 Vita shade in 3 hues)	26 (18 "Vita" dentin shades; 8 proprietary enamel shades)
Resin Components	Bis-GMA, proprietary methacrylate resins	Bis-GMA, proprietary methacrylate resins	Bis-GMA, proprietary methacrylate resins
Filler Type	Barium boro alumina silicates	Barium boro alumina silicates	Barium boro alumina silicates
Filler Particle Size Range/Avg Size	Not provided/0.04um	Not provided/1.0um	Not provided/1.0um
Percent Filler (Wt/Vol)	57 Wt%/40 Vol%	72 Wt%/60 Vol%	76 Wt%/Not provided
Polymerization Shrinkage	Not provided	Not provided	Not provided
Method of Activation	Visible Light Cure	Visible Light Cure	Visible Light Cure
Contains Fluoride	No	No	No
Radiopaque	Yes	Yes	Yes
MSDS Provided	Yes	Yes	Yes
Retail/Govt Price	\$257.25/218.66	\$257.25/218.66	\$622.75/529.34

Data in this table is provided by manufacturers.

IN-HOUSE BIOLOGICAL INDICATORS (BIs) Page 1 of 2

All BIs need to be matched to the mode of sterilization being monitored. **Dry heat** and **ethylene oxide (EO)** are monitored with *Bacillus subtilis* incubated at **37°C**. **Steam and chemical vapor** require *Bacillus stearothermophilus* incubated at **55°C**. Although some products contain both *B. subtilis* and *B. stearothermophilus*, separate incubators set at the right temperature are required for each organism.

There are three basic types of self-contained BIs:

- (1) **Open loop** culturing sets use a spore-impregnated paper strip which is subjected to a sterilization challenge and then aseptically transferred to a separate media vial for incubation.
- (2) **Closed loop** have both a spore strip and the growth media contained within a plastic container which is activated and incubated after the sterilization challenge.
- (3) **Ampule** systems use a spore suspension enclosed in a sealed glass ampule that does not require activation.

Product	Spor Ampule® Steam BI	Spor View® Culture Set	SporView® Self Contained Steam BI	Verify	Confirm ST
Company	SPS Medical Supply Corp 6789 W. Henrietta Road Rush NY 14543 713-359-0130	SPS Medical Supply Corp 6789 W. Henrietta Road Rush NY 14543 713-359-0130	SPS Medical Supply Corp 6789 W. Henrietta Road Rush NY 14543 713-359-0130	Steris 5960 Heisley Road Mentor OH 44060 440-354-2600	Cottrell Ltd 7399 South Tucson Way Englewood CO 80112 303-799-9401
Unit Cost	Retail: Starter Kit: \$275.00 Refills: \$ 65.00 (20/pk) \$275.00 (100/pk) Incubator: \$185.00 Government: Starter Kit: \$220.00 Refills: \$ 52.00 (20/pk) \$220.00 (100/pk) Incubator: \$148.00	Retail: Starter Kit: \$275.00 Refills: \$ 65.00 (20/pk) \$295.00 (100/pk) Incubator: \$185.00 Government: Starter Kit: \$220.00 Refills: \$ 52.00 (20/pk) \$236.00 (100/pk) Incubator: \$148.00 Culture medium included in refill or starter kit	Retail: Starter Kit: \$275.00 Refills: \$ 81.00 (25/pk) \$275.00 (100/pk) Incubator: \$185.00 Government: Starter Kit: \$220.00 Refills: \$ 65.00 (25/pk) \$220.00 (100/pk) Incubator: \$148.00	Retail: Starter Kit: N/A Refills: \$211 (100/pk) Incubator: \$200 Activator set: \$ 30 Government: Starter Kit: N/A Refills: \$114 (100/pk) Incubator: \$135 Activator set: \$ 25	Retail: Starter Kit: \$299.15 Refill: \$139.65 (25/pk) Incubator: \$213.50 Government: Starter Kit: \$170.50 Refill: \$ 70.00 (25/pk) Incubator: \$128.00
Type	Ampule	Open Loop	Closed Loop	Closed loop	Closed loop
Sterilizer	Steam	Steam, EO, C-vapor & Dry Heat	Steam	Steam, EO	Steam, EO
Compatibility					
Read Out Time	24 to 48 hours	7 days	24 to 48 hours	24 hrs steam 48 hrs EO	48 hrs
Product-Specific Incubator	Yes	Yes	No	Yes	No
Shelf-Life	18 months	12 months	18 months	12 – 18 months	18 months
Dual Organism Strip	No	Yes	No	Yes	No

* Data in this table was provided by the manufacturers.

IN-HOUSE BIOLOGICAL INDICATORS (BIs)

Product	Attest™	Unispore	Biosign	Steri Amp II
Company	3M Company Dental Products Bldg 27S-2SE-03 St Paul MN 55144-1000 800-634-2249	Getinge/Castle Inc P O Box 9766 Arnold MD 21012 800-394-4638	Getinge/Castle Inc P O Box 9766 Arnold MD 21012 800-394-4638	Barnstead/Thermolyne Harvey Sterilization Systems 2555 Kerper Blvd Dubuque IA 52001 319-556-2241
Unit Cost	Retail: Starter Kit: \$299.15 Refills: \$139.65 (25/pk) Incubator: \$213.50 Government: Starter Kit: \$146.50 Refills: \$ 43.43 (25/pk) Incubator: \$ 99.30	Retail: Starter Kit: \$378.00 Refill: \$ 84.00 (100/pk) \$398.00 (500/pk) Culture Medium: \$ 51.50 (25/pk) \$135.50 (100/pk) Incubator: \$315.00 Government: Starter Kit: \$262.80 Refill: \$ 57.96 (100/pk) \$274.62 (500/pk) Culture Medium: \$ 35.54 (25/pk) \$ 93.15 (100/pk) Incubator: \$217.35	Retail: Starter Kit: \$378.00 (Steam-21 well incubator & EO) \$475.00 (Steam-14 well incubator) Refill: \$ 83.25 (50/pk) \$ 24.75 (10/pk) \$113.00 (Test packs) Incubator: \$315.00 (Steam - 21 well & EO) \$182.00 (Steam - 14 well) Government: Starter Kit: \$260.82 (Steam - 21 well incubator & EO) \$327.75 (Steam - 14 well incubator) Refill: \$ 57.44 (50/pk) \$ 17.04 (10/pk) \$ 77.97 (Test packs) Incubator: \$217.35 (Steam - 21 well & EO) \$125.58 (Steam - 14 well)	Retail: Starter Kit: N/A Refills: \$ 80.00 (25/pk) \$260.00 (100/pk) Incubator: \$250.00 Government: Same as above
Type	Closed Loop	Open Loop	Closed Loop	Ampule
Sterilizer Compatibility	Steam	Steam, Ethylene Oxide, Dry Heat, Chemical Vapor	Steam, Flash, Ethylene Oxide	Steam
Read Out Time	24 hrs (1261P) 48 hrs (1262P)	5 days	Steam, Flash – 48 hrs Ethylene Oxide – 4 days	48 hours
Product-Specific Incubator	Yes	Yes	Yes	No
Shelf-Life	2 yrs	18 months for strips 12 months for media	18 months	18 Months
Dual Organism Strip	No	Yes	Yes	No

* Data in this table was provided by the manufacturers