

# dental lab products

INNOVATIONS ADVANCING PRODUCTIVITY, PROFICIENCY, AND PROFITABILITY

Vol. 38 No. 08

dlpmagazine.com

## THE FUTURE OF METALS

Where the market has been, how it's changed and where it's going.

## 3D PRINTERS ROUNDUP

All you need to know about this important innovation.

## KHANG ON A COMBO CASE

Creating solutions for a number of issues with the same patient.

## MAKE PRIVACY A PRIORITY

How you can be sure your email is secure.

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## COURSES AND EVENTS CALENDAR

Check out dlpmagazine.com to find out what lab industry events are happening into Spring 2014.



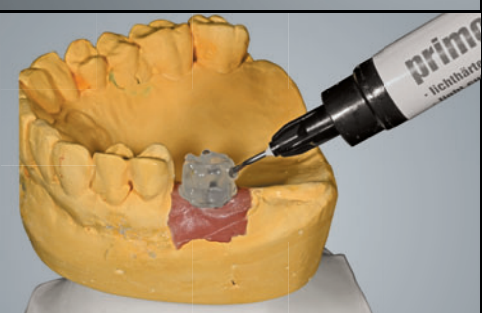
**VIDENT**  
The new VITA AKZENT Plus stain and glaze system is said to be a more comprehensive option.  
*More on p.3...*



**AMANN GIRRBACH**  
The 4-axis, entry level Ceramill Motion 2  
*More on p.3...*



**SOLIDSCAPE**  
The 3Z MAX is a one-touch 3D printer for every lab.  
*More on p.3...*



**PRIMOTEC**  
Primopattern modeling resin now available in clear.  
*More on p.3...*

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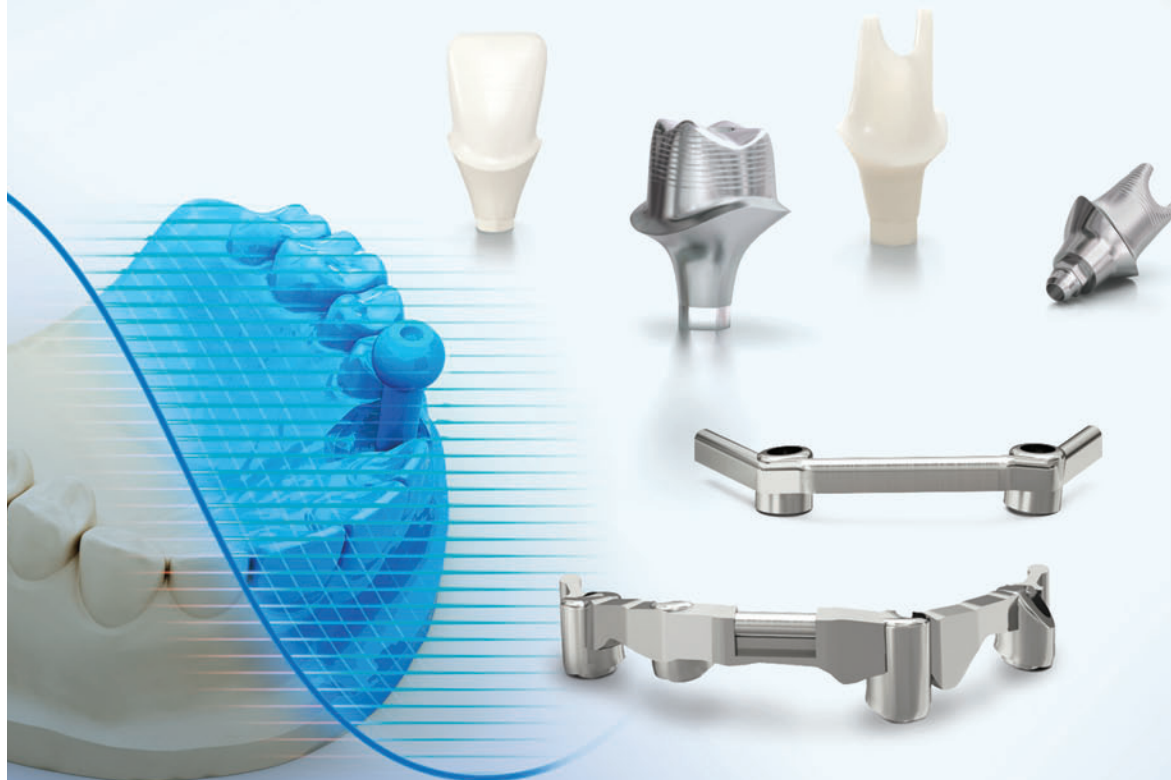
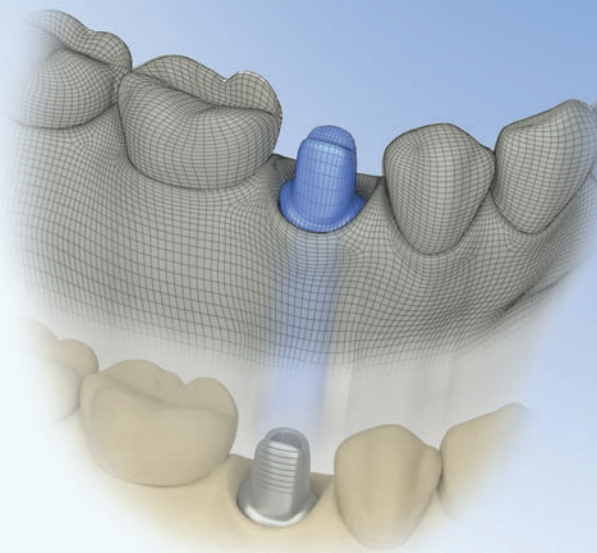
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DENTSPLY Implants introduces **ATLANTIS™ ISUS CAD/CAM** suprastructures for partial- and full-arch restorations. *More on p.38*



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a

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b

#### CLEAR MODELING RESINS

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c

#### 3D WAX PRINTERS

### c 3Z MAX

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d

#### GLAZING & MASKING SYSTEMS

### d VITA AKZENT Plus

**VITA AKZENT Plus** is a comprehensive system of masking stains and glazing agents that provide versatility in shade modification. Users can optimize the shades of various ceramic restorations, including all-ceramic veneers, monolithic restorations and metal-ceramic veneers. The new stains also support a variety of approaches to processing, and are available in three options: as a combined power/liquid, as a paste and as a spray.

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PRODUCTS IN APPLICATION

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PHOTO: ISTOCKPHOTO/THINKSTOCK

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Go to <http://youtu.be/fRiEbSQNJ5Q> to learn about how Zirkonzahn is "Helping Every Lab Technician Become a Hero."

## CLICKS AND PICKS

What lab owners and technicians were searching for and savoring in August @ dipmagazine.com

### 3 most-read articles online

- 01 Primotec's new clear primopattern gel said to be ideal for modeling  
Compiled by DLP Editorial Team
- 02 Delcam's DentMILL CAD software expansion now includes two new mills [VIDEO]  
Compiled by DLP Editorial Team
- 03 VITA's new solutions to improve your restorations  
Compiled by DLP Editorial Team

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## More than a magazine

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If you’re thinking all of that sounds eerily similar to what actually happened in the publishing industry, you’d be right! The Internet has completely changed how all of us access information. Mobile technology has enabled us to take that information with us wherever we go. And technology even greater than Knight-Ridder’s “Tablet” has come along to make tablet computing a great new way to read—be it books, magazines or newspapers.

Technology has, indeed, changed everything. And at Dental Lab Products, we want to take advantage of those changes to bring you better content, and we want to help you keep up with the rapidly changing world of interactive information.

That’s why we’re hard at work every day on our website, DLPMagazine.com. You’ll find up-to-the-moment product news and industry changes, along with updates we don’t have room for in the magazine. You’ll also find exclusive content that complements the print magazine—check out <http://bit.ly/14ZGH92> for a glimpse behind the scenes of one of this issue’s Real Time ROI articles!

We’ve also started Dental Lab Products’ very own YouTube channel: [YouTube.com/DLPMagazine](http://YouTube.com/DLPMagazine). It will be home to great video techniques, product videos and sneak peeks at upcoming articles.

DLP also has its very own iPad app available in the Apple app store! If you’ve got an iPad, don’t miss out—we’ve got a lot planned for the app in coming months, and we can’t wait for you to see what we’re doing.

Whether it’s with online articles, video or our iPad app, we’re excited to head into the new publishing future. We hope you’ll be on the lookout for all of the great stuff we have coming in 2013 and into the next year. **lab**

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Dental Lab Products provides dental laboratory owners and managers with unbiased, clear, and concise insights into optimal uses and best applications of new products. Integrating original research, continuing education, and international industry trends, we support laboratory decision-makers in their commitment to deliver optimum patient care through advancing their proficiency, productivity, and profitability.

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As the go-to product resource for the dental lab industry, the team at *Dental Lab Products* wants to make it as easy as possible for you to get the information you need about new products.

Starting earlier this year, you'll notice we added a reader service card with numbers that correspond to advertisements. In this issue you'll find numbers with each of the products that appear as editorial in this issue of DLP.

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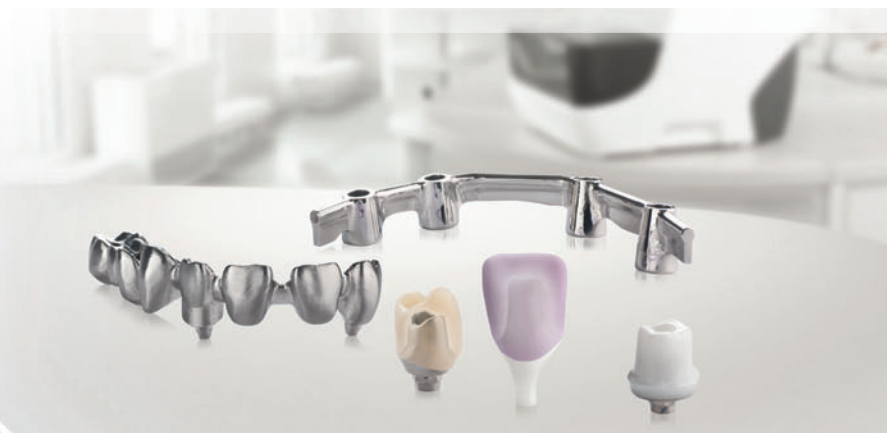
- 01 Your clients are into social media**  
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- 02 It's a great marketing tool**  
 You're always looking for ways to market your lab, and these days social media is a no-brainer. If you regularly update Twitter, Facebook and any other social media accounts connected with your lab, you have the ability to reach countless current and potential customers—especially if you're posting content people want to share.
- 03 Social media offers a deeper connection**  
 You can connect with dentists through traditional marketing methods, but nothing gives you the level of interaction that social media does. If you post a case on Facebook, chances are someone is going to ask you a question about or comment on that case, sparking a conversation. It gives you an opportunity to interact with clients, and even patients, on a different level.
- 04 It's cost-effective**  
 One of the best things about social media is it's free!
- 05 A leadership opportunity**  
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**InSync** Zr  
ceramic system zirconia



## InSync ZR Ceramic Layering Press

The **InSync ZR Ceramic Layering System** is an extension to the InSync FC Stain and Glaze product line. Although developed for Lava™ Plus High Translucency and Jensen HT zirconia, the system reportedly also offers an efficient and reliable method for shading and layering all framework restorations. The system includes a wide range of fine grain naturally translucent and fluorescent powders that are said to be easy to grind and polish, yield low shrinkage, provide the esthetics of a multi-powder build up with just two powders, and match the VITA shade guide simply and predictably. The liners are both translucent and shaded, so technicians can match white as well as shaded zirconia frameworks.

**Jensen Dental**

800-243-2000 | jensendental.com

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## VITA In-Ceram YZ Disc Color

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Luke Kahng, CDT

# Combo case: expertise required

Using skill and experience to work on a case that featured multiple issues, requiring multiple techniques and multiple solutions for optimal results.

When this particular situation was first being considered, the patient and dentist were interested in creating a four-unit implant case involving tooth Nos. 7-10. But the patient had some cosmetic concerns with re-creating his smile that led to a change in plans. The technician offered his opinion that perhaps if the dentist prepped the canines, esthetics would be better maximized. The patient, a 70-year-old male, agreed.

The challenge, then, for the technician, was to choose a color that would complement the many variations of color he could see throughout the patient's teeth. There was a deep saturation of gray, brown and a pinkish tone to his maxillary teeth, with the mandibular dentition being a large assortment of colors as well. For best esthetics, the design of the tooth structure was going to have to include the gingival to the incisal edge,

with pink porcelain being used for the gum tissue area. In addition, the teeth shape would have to be considered.

### CASE STUDY

The initial view image (Fig. 1) shows crowns on tooth Nos. 8 and 9 that were 20 years old. The picture was one year old at the time of presentation because the case had been in

### EXPERTISE FIXING MULTIPLE PROBLEMS



Fig. 1 Initial view



Fig. 2 Occlusal view



Fig. 3 Custom shade matching



Fig. 4 Titanium implants



Fig. 5 Second stage build-up



Fig. 6 After fire, bisque bake stage



Fig. 7 Technician markings to delineate texture, shape and 3D appearance creation



Fig. 8 Staining with GC Lustre Paste

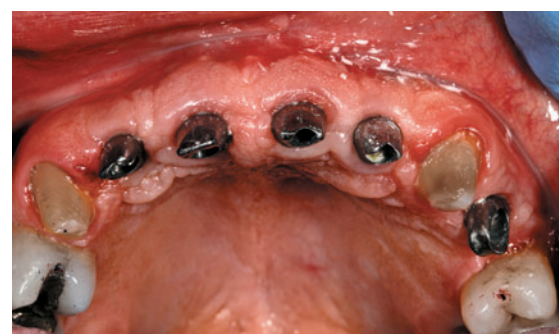


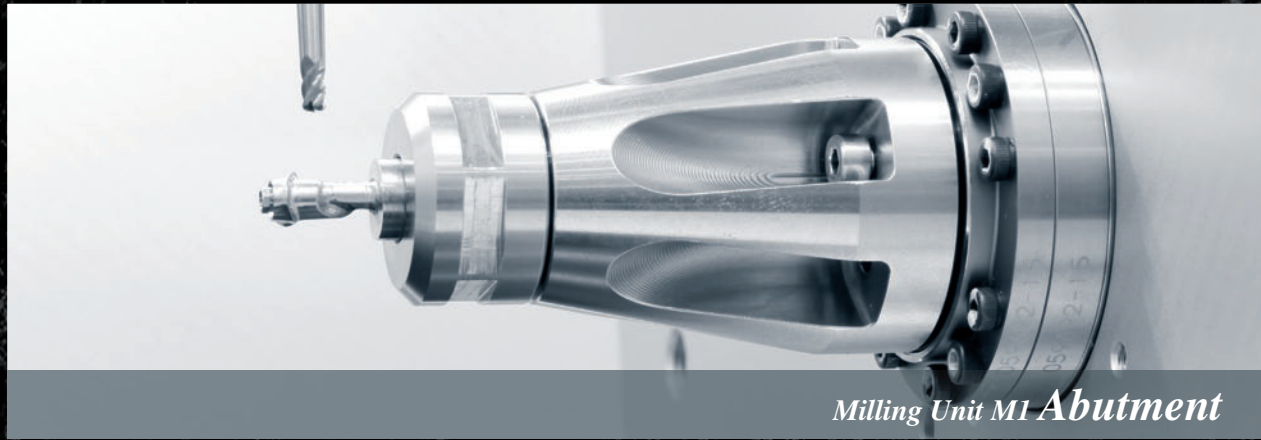
Fig. 9 Implants placed on numbers 7-10 and 12



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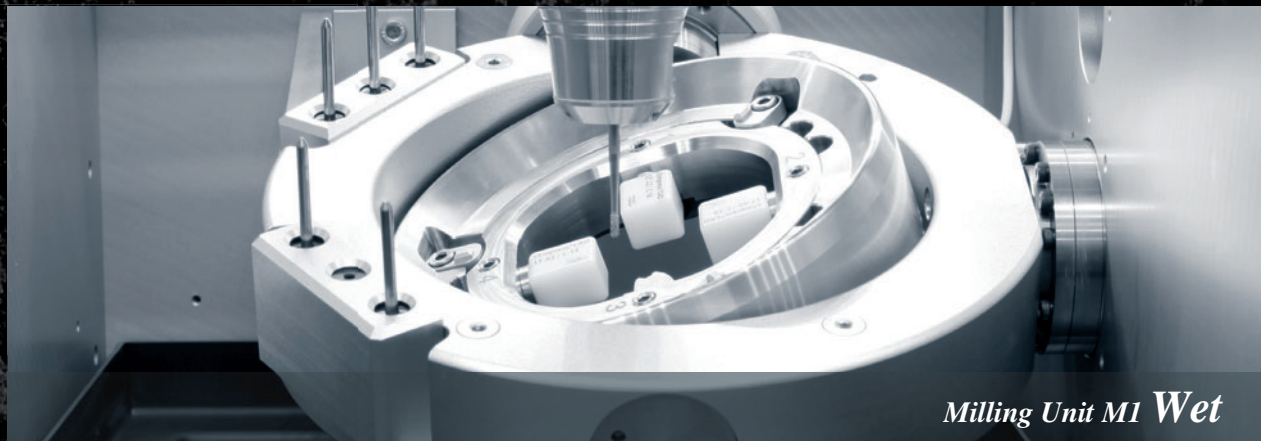
M1



*Milling Unit M1 Abutment*



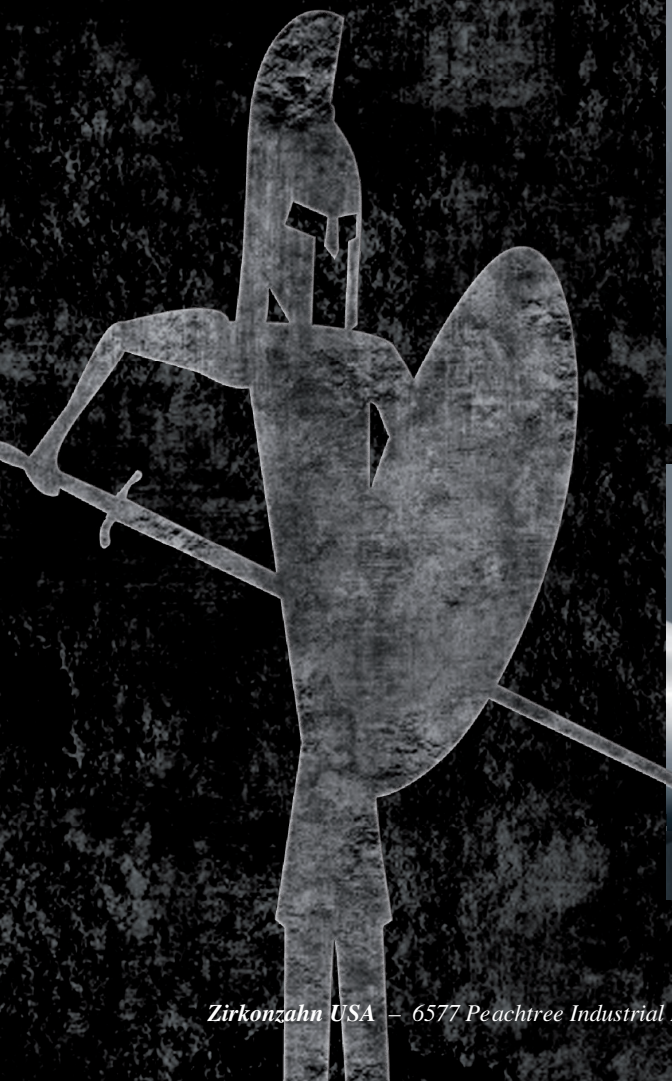
*Milling Unit M1*



*Milling Unit M1 Wet*



*Milling Unit M1 Wet Heavy*



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Fig. 10 Immediate try-in



Fig. 11 #11 try-in



Fig. 12 Color check



Fig. 13 Kneeling view



Fig. 14 After try-in



Fig. 15 Color harmony, patient very happy with results

the planning process for that long. The doctor planned to extract tooth Nos. 7-10 and place implants. There was also noted a huge gap between the teeth, creating a black triangle that would need to be masked. Tooth Nos. 6 and 11 would be prepped because they were too dark and the contour and color were not acceptable. To make his smile better in proportion and dimension, it was necessary to consider all six of the anterior maxillary teeth. In **Figure 2**, we see the occlusal view, noting the large gap in tooth No. 11 with the amalgam. This would be corrected with the addition of a crown.

**01** **Figure 3** is a view of the mandibular teeth with the technician matching the color using a variety of LSK121 ceramic shade tabs. He decided after studying the dentition that the tooth to match was No. 25 because its color was brighter with a healthier appearance. This color became the target for the fabrication of the maxillary crowns and bridge. Technicians are often confused about which tooth to match when they see a large variety of color. In my opinion, it is best to try and duplicate the one that is most likely to blend and create coordination for the patient's overall smile appearance.

**02** In **Figure 4**, titanium implants were placed that had been produced by the GC Milling Center ([gc-at.com](http://gc-at.com)).

**03** In fabricating the second stage porcelain build-up (**Fig. 5**), I used GC TO colored porcelain. Because the teeth were somewhat longer than I liked, I added pink porcelain GU gum color with TO colored enamel to the top of that. In this way I was not creating one solid pink color, but rather a natural appearance with clear color in between the layers.

**04** After firing, the bisque bake stage is shown (**Fig. 6**). I was especially interested in producing good form and contour between tooth Nos. 6 and 11. For better esthetics, I would do some grinding to mimic natural contouring.

**05** To complete the grinding, I drew black lines on the restorations to mark where I would be creating texture and shape (**Fig. 7**). From the incisal to the gingival the red area demonstrates the three-dimensional appearance I wanted to form through grinding.

**06** After grinding, I began staining the restorations with GC Lustre Paste (**Fig. 8**). It's important to note the gingival area was not completely pink but had a dark brown tone to it. For the middle section, I used external luster paste and the incisal 1/3 revealed a brown color all throughout, with orange blending inside. In between the teeth I placed dark brown staining for natural looking esthetics. The key to this coloration was the Lustre Paste blending from the gingival to the incisal. It was not consistent in nature, rather more patchy in application because that is nature's way. The restorations were fired at 880°C.

**07** Pictured is an occlusal view of the implants placed on tooth Nos. 7-10 and 12 (**Fig. 9**). In addition, the dentist prepped tooth Nos. 6 and 11. The bridge and the single-unit crowns were all porcelain fused to high noble metal with porcelain butt margins. During the immediate try-in phase, I placed the restorations half-way into the area to see the color and texture and compare it to the patient's natural dentition (**Fig. 10**). Crowns fabricated for tooth Nos. 6 and 11 were also tried-in to compare the right and left sides of the mouth with the lower dentition to make sure there was a correct duplication with the porcelain (**Fig. 11**).

The left canine had been correctly duplicated using the lower dentition as a guide (**Fig. 12**). The correct amount of enamel and dentin color had been applied.

**08** During try-in, I asked the patient to bite down. I knelt down and photographed the patient to illustrate color matching in between the lower and upper teeth. The color is natural in appearance, which gave everyone a feeling of successful achievement (**Figs. 13 and 14**). The match is harmonious and the patient very happy with the final results (**Fig. 15**).

## CONCLUSION

The importance of shaping the teeth from the gingival to the incisal areas cannot be overemphasized. Also, the size of the teeth needs to fit with the rest of the patient's natural dentition. Custom shade matching was accomplished through careful analysis and planning as to which tooth to match. There is always question as to whether the patients we are working with want to complete both the maxillary and mandibular areas of their mouth, and once that is known, an effective plan can be created. After that is in place, it can be completed. [lab](#)



# Keeping partials stress-free

Using the VKS-SG Attachment Systems in a partial case.

by Peter H. Kuch, CDT



Peter H. Kuch

**Over the years, most of the** problems with any attachment are caused by poorly designed or fitting RPD (removable partial denture); specifically, frames without proper reciprocating arms. For this reason, we would like to recommend the following technique: The fabrication of a precision attachment RPD with custom metal housing and lingual arms, as separate components. This

provides many restorative benefits for the dental technician and dentist. This technique allows technicians to fabricate highly accurate and stress-free partial frames. When using the VKS-SG system, as well as most other attachments, for fixed-removable combination cases, it is important to have an exact fitting reciprocating lingual arm and shoulder rest with an interlocking vertical groove. The main function of these is to divert occlusal loading forces away from the attachment and center them down



### VKS-SG Attachment Systems

The VKS-SG is available in two sizes; 2.2 mm and 1.7 mm in diameter. They can be used in virtually any attachment case. SG's can be placed almost anywhere: on the buccal, lingual, distal or mesial of a bar or crown, and are ideal for cases with limited room.

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**Fig. 1** Snap VKS-SG 2.2 mm yellow matrices over the ball attachment.



**Figs. 2 & 3** VKS-SG 2.2 mm Castable Housing is placed over the yellow matrices. Cut the retention tail off the castable housing if necessary to follow the contour of the ridge and apply Pattern Resin into the shoulder groove between the rest and onto the plastic castable housing to create the lingual arm (remove yellow matrix before casting).

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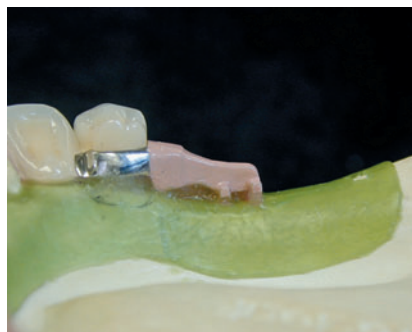
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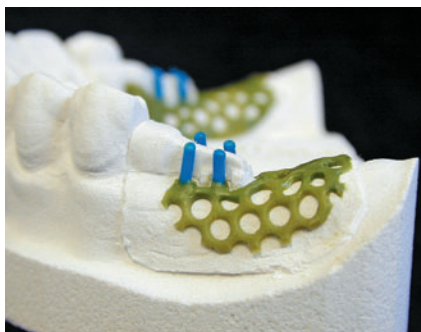
**Fig. 4** Sprue, invest and cast the housing patterns with the lingual arms.



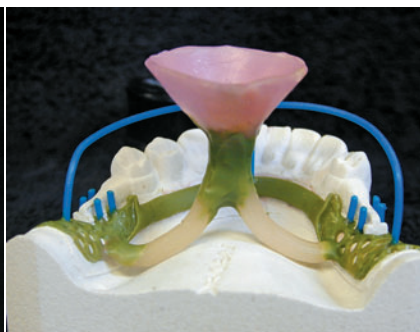
**Fig. 5** After fitting and sandblasting, use light curing pink opaquer to mask out the metallic gray color.



**Fig. 6** Block out and duplicate the master model to create a refractory model.



**Figs. 7 & 8** Sprue the waxed partial and cast.



**Fig. 9** Partial is also color masked with light curing pink opaquer.

the long axis of the tooth, also to avoid the partial slipping distally, especially on free-end saddle cases.

### IMPORTANT TIP

Often times after cementing the crowns, the attachment may no longer fit passively; in that case, it is very simple to use a solder iron, heat up the bonded-in metal housing, and pull it out of the major connector. After creating the space in the acrylic, it can be reset in the patient's mouth with quick cure acrylic.

The intent of this technique is to separate the making of the attachment section from the rest of the partial. As many RPD technicians probably are able to cast a chrome-cobalt partial with attachments and have a passive-fit across the arch, in my 40 years I have not been able to do this. For many years, I split the work process and created an absolute precise attachment casting with lingual arm and in the earlier years we soldered the attachment to the chrome cobalt partial. Even with that we found that after cementing the

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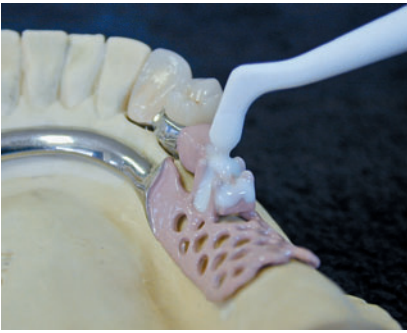
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**Fig. 10** Use adhesive to bond the custom metal housings with lingual arms to the partial frame. Soldering or laser welding may be considered, but would make later removal of the attachment impossible. We recommend bonding.



**Fig. 11** Set-up teeth, process and finish acrylic as usual.

crowns, many times there was a slight rock or movement in the attachment section. At this point I started to bond instead of solder. Bonding makes later removal and subsequent resetting of the attachment section possible. This turned out to be very beneficial for myself and the dentist as it prevented me from remaking some of those cases. A further benefit of making the attachments separate is that I make the attachment section as soon as I finish the crowns, therefore if the dentist seats the crowns right away he can then pull the attachment sections in the final impression for the partial, which gives me a very precise relationship to the crowns.

**STEP BY STEP**

**01** In waxing the crowns, make sure the attachments are parallel and create a lingual parallel wall with a shoulder and a mesial groove.

**02** Invest and cast.

**03** Finish the porcelain work in a traditional manner.

**04** Finish and polish the crowns.

**05** Make sure your lingual arm recipient has no undercuts.

**06** Place matrix on the attachment, snap on the castable housing.

**07** Model on the lingual arm using a quick-cure resin, eg PiKuPlast.

**08** Pull and cast the attachment section. Remove the matrix.

**09** After casting, fit the casting to the crown.

**10** The case should now go out to the dentist for a try-in.

**11** If the dentist decides to seat the crowns at this point, have the

dentist pull the attachment sections in a new master impression. Otherwise, the dentist can pull the crowns in the master impression.

**12** After pouring the master model, the chrome cobalt partial is created in a traditional manner.

**13** The use of pink opaquer as shown in the pictures is optional.

**14** The attachment section and the chrome cobalt partials are now bonded together.

**15** Teeth are set up and the partial is finished in a traditional manner.

**lab**

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# A better implant restoration

Using Ivoclar Vivadent's IPS e.max Press Abutment Solutions.

by Ken Cathers, CDT

**Traditional dental implant** restorations can be challenging for dentists and laboratories. Several factors must be considered to ensure predictable, successful placement and subsequent restoration. When dental implants are cement-retained, inadequate clean-up of excess cement adjacent to implant margins could lead to peri-implantitis. When dental implants are screw-retained, screw access channels require careful management to create proper anatomy, esthetics and function.

To address these challenges, a simplified option has been developed. This has been accomplished with the creation of hybrid abutment solutions. IPS e.max Press Abutment Solutions from Ivoclar Vivadent allow

for simple, accurate placement of dental implant restorations that demonstrate a natural emergence profile, shape and esthetic properties based on the individual clinical situation. Custom characterizations can be added to further enhance the life-like esthetics and seamless blending with natural dentition.

The use of lithium disilicate over a titanium base produces a restoration with a strength of 400 MPa and life-like optical properties. The IPS e.max Press Abutment Solutions allows laboratories to create either one-piece hybrid abutment crowns attached to titanium bases, or hybrid abutments bonded to a titanium base onto which a crown can be cemented. Benefits of this fabrication



### IPS e.max Press Abutment Solutions

In addition to an optimum design of the emergence profile, the individually fabricated, tooth-colored abutment features a long-lasting esthetic appearance, even in cases of gingiva recession. Given the fluorescence of the LS<sub>2</sub> glass-ceramic in conjunction with individual characterizations, a lifelike appearance is achieved. The seating of hybrid abutments is facilitated as a result of their geometry, and excess cementation material can be easily removed.

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SCAN:



**Fig. 1** A pin was inserted into the screw access channel.



**Fig. 2** A coping was designed with modeling resin.



**Fig. 3** The emergence profile was designed with resin.



**Fig. 4** The remainder of the coping was built up with wax.



**Fig. 5** The dimensions of the wax-up were verified against a putty matrix.



**Fig. 6** A 2.5 mm sprue was attached to a circular area of the wax-up, being certain to keep the sprue parallel with the screw access channel.



**Fig. 7** The wax-up was placed in the investment ring, and the investment was carefully poured, making sure to fill the screw channel.



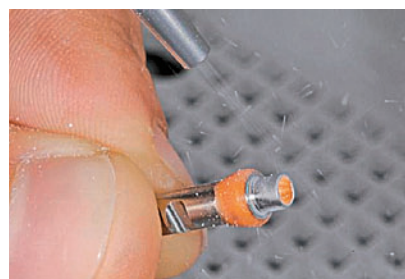
**Fig. 8** The restorations were removed from rings, divested and immersed in Invex Liquid to remove the reaction layer.



**Fig. 9** The fit of the abutment was tested on the titanium base, and minor adjustments were made with diamond-coated instruments.



**Fig. 10** Characterizations were applied to the emergence profile and fired.

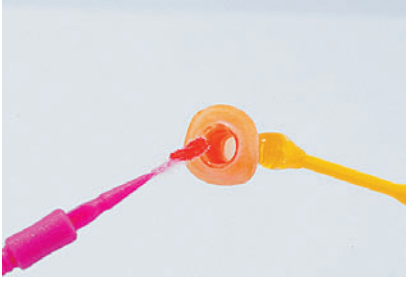


**Fig. 11** The Ti base was prepared for bonding by placing wax on the screw channel and emergence to protect them.



**Fig. 12** Monobond Plus was applied to the bonding surface of the Ti base and left for 60 seconds.

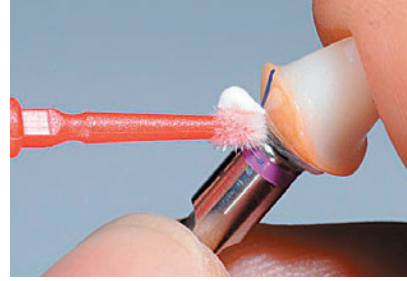




**Fig. 13** IPS Ceramic Etching Gel was applied to the bonding surface of the lithium disilicate for 20 seconds.



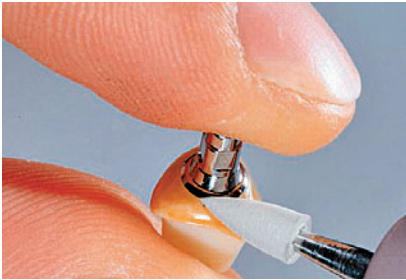
**Fig. 14** Cement was applied directly to the titanium base and the bonding surface of the lithium disilicate.



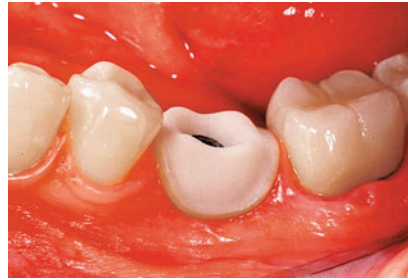
**Fig. 15** Excess cement was cleaned from the emergence and the screw channel.



**Fig. 16** Liquid Strip glycerin gel was applied to the cement joint to prevent the formation of an inhibition layer.



**Fig. 17** The cement joint was then smoothed with rubber polishers.



**Fig. 18** View of the hybrid abutment in the mouth.



**Fig. 19** View of the crown restoration affixed to the hybrid abutment in the mouth.



**Fig. 20** View of a hybrid crown at the laboratory.



**Fig. 21** View of a hybrid crown being placed in the mouth.

technique include providing a laboratory a new product offering for dentists, cost savings compared to other customized abutments, faster turnaround and improved esthetics compared to traditional titanium or zirconia abutments.

### THE CASE

**01** An appropriate titanium base that corresponds to the implant being used is selected. The titanium base (Ti base) is placed on a model of the patient's mouth, and a pin is inserted into the screw channel (**Fig. 1**).

**02** Modeling resin is then used to design a coping around the Ti base and pin because the resin is more rigid than wax and will better withstand being slid on and off the Ti base (**Fig. 2**).

**03** The emergence profile is created with resin (**Fig. 3**), and the remainder of the coping is built up in wax (**Fig. 4**).

**04** The dimensions are verified against a putty matrix (**Fig. 5**). After removing the pin from the screw channel, attach a 2.5 mm sprue to a circular area, keeping the sprue parallel with the screw channel. Do not tilt the sprue (**Fig. 6**).

**05** The wax-up is placed in an investment ring, and the investment is poured slowly, being sure to fill the screw channel (**Fig. 7**).

**06** The investment is placed in the pressing furnace and preheated for 60 minutes. The appropriate press program is selected according to the ingot and ring size used.

**07** The restorations are removed from the ring, divested (**Fig. 8**), and immersed in Invet Liquid to remove the reaction layer.

**08** The fit of the abutment is verified on the Ti base, and minor adjustments can be made with diamond-coated instruments (**Fig. 9**).

**09** The sprues are cut with a separating disc, and the attachment points of the abutment and crown are smoothed. The emergence profile and fit of the abutment are verified on the model.

**10** Characterizations can be applied to the emergence profile of the

abutment using IPS e.max Ceram shades and Essence stains (**Fig. 10**), after which the abutment should be fired. Glaze is then applied and the abutment fired again.

**11** The Ti base is prepared for bonding by placing wax on the screw channel and emergence to protect them, while the bonding area is carefully sandblasted with Al<sub>2</sub>O<sub>3</sub> at low pressure (**Fig. 11**). Monobond Plus is applied to the bonding surface of the Ti base and allowed to react for 60 seconds (**Fig. 12**).

**12** IPS Ceramic Etching Gel is then applied to the bonding surface of the IPS e.max Press abutment and left for 20 seconds, after which Monobond Plus is applied to the bonding surface of the abutment and left to react for 60 seconds (**Fig. 13**).

**13** An opaque shade of cement is then applied directly to the bonding surfaces of the Ti base and the IPS e.max Press abutment, and the two components are seated together (**Fig. 14**). Excess cement is easily cleaned away from the emergence and screw channel with a brush (**Fig. 15**).

**14** Liquid Strip Glycerin Gel is then applied to the cement joint of the completed hybrid abutment complex to prevent the formation of an inhibition layer. The cement is allowed to set for about seven minutes (**Fig. 16**). Rubber polishers

can be used to smooth the cement joint (**Fig. 17**), completing the hybrid abutment.

**15** The abutment is placed in the patient's mouth and torqued to equigingival margins (**Fig. 18**). The screw access channel is then sealed with composite material (i.e., Tetric EvoCeram, Ivoclar Vivadent) and light cured. The IPS e.max Press crown is then cleaned and etched, and both the abutment and crown are treated with Monobond Plus for 60 seconds.

**16** An opaque shade of implant cement is used to bond the crown to the abutment. The finished restoration will blend seamlessly with adjacent teeth (**Fig. 19**).

### CLOSING THOUGHT

Using the technique outlined above will enable laboratory ceramists and technicians to produce implant supported restorations that demonstrate the proper emergence profiles, esthetics and function. The restorations also will be more predictable. IPS e.max Abutment Solutions simplify and increase predictability of a once challenging laboratory function. In addition to the ability to easily create custom hybrid abutment solutions, the technique also allows the creation of quickly fabricated hybrid implant crowns (**Fig. 20**). Both of these options help to maintain a patient's oral health, with minimal trauma to the gingival tissue (**Fig. 21**). [lab](#)



# The Refining of the METALS Market

**Looking at the opportunities, challenges and innovation occurring in the alloy world—sometimes all at the same time.**

by Robert Elsenpeter, Contributing Writer

In the 1970s, James Bond faced off against a villainous henchman who went by the name of Jaws. Jaws' *modus operandi* was confronting his prey with giant, steel teeth. In that day, Jaws' dentist and the lab the dentist worked with probably did the best they could with what materials were available, but as the years have passed, metals in restorations got better and better and even led to a revolution in materials. Whether because of the performance and reliability of new ceramics, or the unpredictable price of metals, it's safe to say that how labs use—and think about—metals has changed in a big way.

## PRICE VOLATILITY

Price always has been an important consideration when it comes to selecting a material during restora-

tion creation. And given that the prices of precious metals like gold, silver and palladium change regularly—sometimes as often as twice a day—metals can be an unknown variable for dental labs. It's difficult to know whether they're going to make a profit on a job and, if so, just how much profit there will be.

“With gold increases, palladium and some of the more traditional metals have been challenged, but there is a market shift,” says Dr. George Tysowsky, Vice President of Technology at Ivoclar Vivadent. “The big growth in metals is the lower noble metals, or the non-precious alloys that have been redeveloped and maximized to these opportunities, and certainly they're growing quite considerably in that category. Like cobalt-chrome and some of the low-gold content alloys have been alternative solutions in new market growth. And they've been an expansion for those that are staying in the alloy field.”

“Arguably the only certainty of the precious metals markets is that prices will continue to rise and fall,” says Ann Pellegrini, Brand Manager at Jensen Dental. “Having been in the industry for 25 years, I've seen the spot price for gold at less than \$300 an ounce and more than \$1,800 an ounce, and palladium at less than \$150 and at nearly \$1,000. Jensen Dental has worked hard to understand the needs of our clients over our 37-year history, and so our product offerings have evolved as their businesses have.

“Alloy composition obviously has an effect on intrinsic value and cost, but a major part of our alloy development philosophy is that simple alloys tend to be more reliable in the lab,” Pellegrini continues. “That's why you'll see a lot of Jensen alloys that contain one or two fewer elements than competitive alloys. Where a Jensen alloy might contain



Zenostar material from Ivoclar Vivadent, part of the all-ceramics revolution.



only gold, palladium, platinum, indium, iron and a grain refiner, a competitive product in the same category may also have tantalum, zinc or tin, maybe some rhodium, niobium or even titanium. Some of the less common elements tend to oxidize when re-melted several times, and make the alloy less lab-friendly. Our portfolio of dependable and consistent alloys are manufactured using only raw materials of exceptional purity, and our commitment to quality is demonstrated in the design and performance of our alloys."

But it isn't necessarily just the price or make-up of alloys that's driving a change in how labs use metals. The performance abilities and cost stability of new ceramics is a huge draw.

"I think it's a combination," Dr. Tysowsky says. "If you ask a dentist why he's using monolithic lithium disilicate or why he's using a monolithic zirconia, of course durability, function and esthetics are important, but I think fixed price control would be another factor in there. He knows he can get a crown for a fixed price, versus dealing with the volatility of a variable daily price on gold or precious metals. All-ceramics is a fixed entity. In today's economic world, I think that's an appeal, and controls a variable that the patient or the dentist doesn't want to deal with."

## ALLOY COST

The price of metal is a consideration when selecting which material to use for a restoration, but that issue is not one created by the dental industry—it comes from a higher source.

"When we look at the metals market today, it's purely intrinsically driven," says Dr. Michael Gaglio, Vice President of Marketing for Ivoclar Vivadent. "It's market-driven—not by the dental market, but by the global currency market. [For instance], gold, over the past 18 months, has gone from \$1,800 an ounce down to \$1,200 an ounce. But along that way, metals manufacturers—including companies like Ivoclar—have tried to support the laboratories through new metals development, which kind of optimized some of the precious metals properties with some of the non-precious costing. We can give them more of a controlled-price alternative."

Manufacturers can mitigate the cost of restorations by managing their alloy formulas and creating different alloys with different properties, and different prices.

"So at the end of the day, even though precious metal prices seemed to have gone up, labs have been able to control their prices by using some of the new developments, such as our Callisto CPG, which is our controlled-price gold alloy," Dr. Gaglio says. "It's a palladium-based, low-gold content that has great handling properties, but is still close to that semi-precious, non-precious category of pricing. And we're not the only company trying to make those developments. It's really a must."

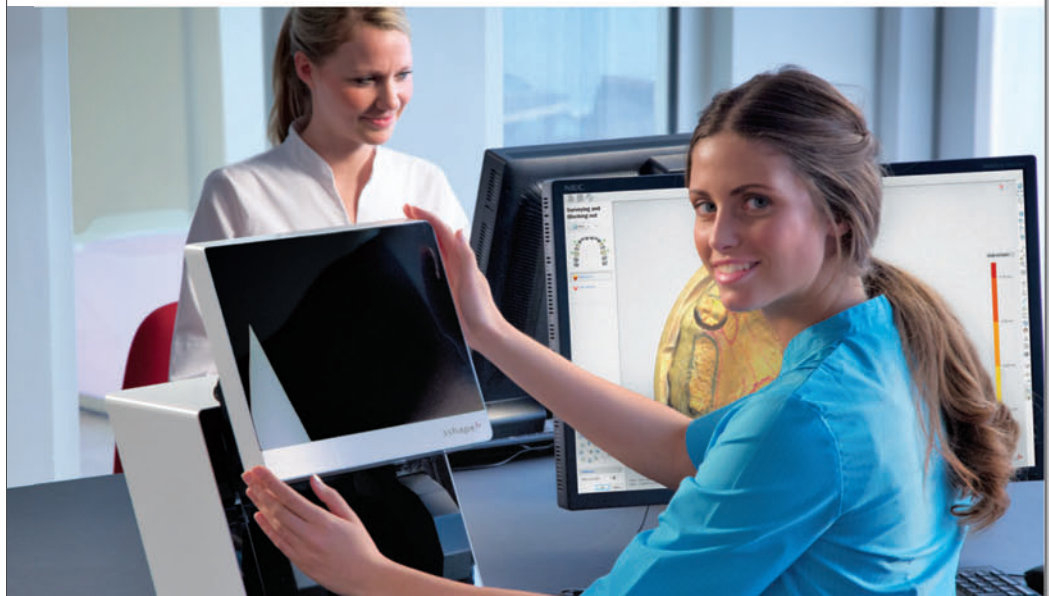
## PRECISION WORK

In many ways, the price of metals has caused labs to refine their craft, learning new and advanced techniques. For



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The Callisto CPG alloy solution from Ivoclar Vivadent. Callisto CPG is a cobalt-chrome-based ceramic alloy with palladium and gold content at a fixed price.

instance, Barbara Wojdan, President of Knight Dental Group, noted that rising metal prices prompted her lab to increase use of CAD/CAM technologies for metals-based restorations. As a result, they were able to create more precise restorations, using less alloy.

“We invested in CAD/CAM over nine years ago in the early stages of the technology, mostly to take advantage of the growth trend in all-ceramic restorations,” she says. “So naturally, when the alloy prices started going up so dramatically, we began to look in that direction. We began designing and milling all of our metal substructure designs for both single unit and bridges as well as our full-contour gold crowns.”

The result was a more exact, accurate product that was created with less material.

“This allowed us to be more precise in our thicknesses and fit, which in return lowered our metal usage,” she adds. “For us, hand-waxing limited our control of thickness, which typically required higher metal usage.”

### THE RISE OF A COMPETITOR

Another challenge to the metals market has been the growing popularity of ceramics as an alternative to alloys. Both metals and ceramics have a place in the world of dental lab work, Dr. Gaglio says. Looking back 25 years ago, the market was all porcelain fused to metals (PFM).

In 1992, Ivoclar introduced Empress, the first all-ceramic solution. The all-ceramic portion of the market remained at 15 percent for almost 10 years, leaving the

remaining 85 percent for metal-supported restorations. But by 2005, all-ceramics represented about 20-25 percent of the market.

“Then came the introduction of e.max in 2006, which provided the labs with a high-strength, metal-free alternative,” Dr. Gaglio says. “We saw a real transition begin away from metal to all-ceramics. Following that introduction was the introduction of monolithic zirconia. With monolithic zirconia and the e.max today, we see the market at a 58/42 split between all-metal restorations and all-ceramic restorations.”

Even with ceramics becoming more prevalent, metals still have a place in dental labs, alongside the growing technology. After all, metals provide some significant qualities that still make them attractive options for many labs.

“While overall industry demand for porcelain-fused-to-metal and cast-gold restorations has certainly decreased, Jensen still maintains top market share in many alloy categories, and supplying the top quality alloys our clients need is still an important part of our business,” Pellegrini says. “At the same time, many laboratories are in the process of transitioning to some aspect of digital dentistry, and Jensen is well prepared to meet those demands as well with Preciso, our Digital Dentistry Solution. [M]onolithic alternatives allow labs to realize true labor and material savings while consistently delivering the beautiful results their dentists demand. In addition, we’ve seen consistent growth in our Jensen WX millable wax material, which labs are using to cast alloy from designs they create in their CAD software. The efficiencies gained by digitally designing and milling their wax as opposed to

doing it by hand, in part, offset some of the volatility in the alloy market.”

### DIFFERENT ALLOYS; DIFFERENT RECIPES

The price of precious metals is a factor for many labs, and manufacturers have seized the opportunity to provide new alloys for their clients.

“Our newest alloy is BLAZE, a casting alloy that has been very well received by laboratories who are looking to meet the demand for economical gold crowns head-on,” Pellegrini says. “With five percent gold, along with a low density of 10.3g/cm<sup>3</sup>, BLAZE is designed for fabricating beautiful and economical restorations while offering resistance to corrosion and tarnish. During the development process here at Jensen, a variety of compositions were tried internally and with designated laboratory field-testers before settling on the one with the best combination of color and composition for extremely reliable output for this alloy category.”

Some labs use different alloys with different formulations to keep costs low. For instance, Wojdan looked to the changing prices and moved to an alloy that was more cost effective, yet still delivered the performance they needed.

“We review alloy prices on a daily basis,” Wojdan says. “In the beginning of the alloy price jump, we simply changed to alloys that were less price-volatile, such as those that were of lower nobility and subsequently were of lower cost. The alloy manufacturers were instrumental in developing these new alloys and were able to maintain the important properties needed for meeting our fabrication needs at a lower cost.”

When labs talk about alloys in their restorations, they aren’t referring to one material. There are dozens of alloys, each offering something distinctive. Different “recipes” can save money and increase performance.

“We sell over 60 different alloys,” Dr. Gaglio says. “Historically, the way a lab would select an alloy would be based, first, on performance; second, based on price. It’s like a chef in a restaurant—we have various recipes for different alloys. And based on the intrinsic prices and performance requirements, a lab can make a decision and say, ‘I’ll use a different alloy because this one has less gold or less palladium,’ and based on the new price of gold or palladium, they choose from that.”

PHOTO COURTESY OF IVOCCLAR VIVADENT

## ● ● ● HOW ARE METALS PRICED?

The price of precious metals is not etched in stone and is, in fact, quite dynamic—it is constantly in a state of flux. Most metals are priced based on a valuation as established by the London Gold Market Fixing Ltd.

The gold fixing is meant as a way to settle contracts between members of the London gold markets, but are used as the recognized rate for pricing gold products throughout the world market. The gold fix is conducted twice daily: at 10 a.m. and 3 p.m., London time. The ‘fix’ of gold prices goes back to 1919—silver dates back to 1897.

The London Gold Market Fixing Ltd. is made up of five members:

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At the start of each price-fixing, the chairman announces the opening price to the other members of the board, who then relay that information to their customers and accept orders. Based on those orders, the gold price is adjusted up or down until demand and supply are matched. At that point, the price is declared “fixed.”

The silver fix is a similar process, but happens only once a day, and only three members of the gold market—Deutsch Bank, Scotiabank and HSBC—are involved in the fix.

For the current price as established by the gold fix—and to review decades worth of gold prices and the trends—visit: <http://bit.ly/1888fw4>.



## ALLOY CONFIGURATOR ● ● ●

Manufacturers offer dozens of different types of alloys. Knowing which type to use depends on your client's specific needs. To select the best formulation, manufacturers provide charts comparing the capabilities of each type of alloy.

Ivoclar Vivadent offers an online tool that allows you to input your various needs, and then the tool presents you with options: <http://bit.ly/1clbhjv>

Alloys have been altered in recent years so that performance is delivered at a reduced cost.

"In the past two years, there have been new developments of products to capitalize on utilizing minimal amounts of precious metal blended together with non-precious metals so that we could give the laboratory and the dentist an alternative to the high price of metals they had previously been using," Dr. Gaglio says.

But cost savings isn't the only reason for different alloy compositions. Alloys are chosen for a number of reasons.

"The interesting part about dentistry is that there isn't one material that's a panacea for everything," Dr. Tysowsky says. "Obviously, esthetics and cost are driving factors in the marketplace today, but metals will continue to maintain a strong hold. The economical alternatives in metals selection will continue to grow and provide a greater benefit, but as the needs of the patients expand, metals certainly play a viable role in that field, and continue to develop and play a significant factor in the future."

And while cost is a consideration, manufacturers have been able to balance the needs of performance against cost.

"In the past, if you wanted high-performing alloys, it was typically the high-gold, palladium-based materials for easy casting, finishing, margin burnish ability, etc.," Dr. Tysowsky says. "Today with the new evolution and emphasis on non-precious or low-precious alloys, they are high-performing. They've improved tremendously and provide an easier castability and finishing product as well."

## CHOICES, CHOICES

While labs have many options in front of them—dozens of different alloy formulations and new ceramics—ultimately, the choice comes down to what the client wants.

"You're not trying to force a product; you're trying to satisfy the customer's needs," Dr. Tysowsky says. "Metals play a significant role in dentistry. It has a variety of applications. PFM is still the benchmark of reliability in clinical dentistry, and many practice that accordingly. We see a variety of applications, and the trend is more significant in the maintenance of metals application. That's especially the case in implant dentistry with larger cases, like fixed hybrids—when we try to do combination cases with titanium bars, and cobalt-chrome bars, and other factors. So metals have a place, and we treat them equally

with our other materials to satisfy the customers' needs."

And a major consideration is keeping clients informed about their options.

"As alloy prices started going up, we actually made it an objective to communicate with our clients to keep them informed of what was happening, how this might impact their laboratory fees and what other choices were available," Wojdan notes. "Price has always been a major factor, but drastic fluctuation really dictated alternative solutions, such as all-zirconia products which, at the time, were less esthetic; it was going to look more opaque [and] it wasn't going to be as pretty, but it's definitely less expensive than full gold. Now, it's more esthetic than ever, it's strong and it's not going to cost \$100 more today than it did yesterday."

Naturally, the more educated customers are, the better choices they will make. And there is no better source of education than the labs and manufacturers themselves.

"We were very proactive," Wojdan says. "We offered CE opportunities for our clients very early on and continue to do so on a large scale. We reviewed and evaluated many different materials that we would incorporate to meet the varying needs of our entire client base."

## CONTINUING EDUCATION

With new ceramics and alloys on the market, labs must understand these new materials. Many manufacturers offer education, which is something labs should take advantage of.

"We offer courses in all esthetics and monolithic zirconia and lithium disilicate technologies, but we also offer courses in basic PFM, casting of metals and traditional avenues," Dr. Tysowsky says.

Adds Dr. Gaglio, "Labs have had to change their techniques with these new age alloys that we're developing. They do handle differently than the high gold, high palladium alloys, but the labs have been very receptive to learning these new techniques to stabilize their pricing, stabilize their profitability and deliver a quality end product to the dentist."

The use of metals in lab work is diminishing, but it isn't because of one, lone reason. Between rising costs, price volatility and the growth of all-ceramics, there are many reasons metals use is on the decline. But the move to all-ceramics might never be a complete transition—there are some things metals just still do better.

"My personal opinion is that we'll continue to see more use of all-ceramic materials, and, eventually, metal-based restorations will be a fraction of what we do—particularly where specific properties or requirements can't be met by current all-ceramic materials," Wojdan says.

It's clear metals will continue to be a valuable asset for every lab. But the metals market has changed—labs are more selective in what they want from a material, and manufacturers have answered the call with new, cheaper alloys that continue the quality provided by all-metal options. Where the metals market goes remains to be seen, but the innovation found in the laboratories of manufactures and in dental labs all over the world will be pushing the boundaries into the future. **lab**

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# 3D Printers 360°

**A round-up of the most groundbreaking 3D printers available.**

*Introduction by Chris Brown, BSEE*

3D printers were once exotic. Rarely seen or heard of, creating prototype parts for manufacturing companies were their only use. Available materials were limited, costs were out of reach for most companies, and dimensional accuracy was sufficient for only basic suitability evaluation.

Fast forward to 2013: Researchers are printing replacement human body parts such as heart valves, blood vessels, ears, bones, joints and even skin. Comedian ventriloquists are printing their own puppets. Fashion designers are printing dresses and shade tree mechanics are printing parts for their most recent car restorations. The first 3D printers employed a photo-sensitive polymer resin. Today's printable materials include similar resins, thermoplastics, metals and even food products.

3D printing is a layer by layer "additive-manufacturing" process. The platform the printed part is built on is typically called the build tray. The build envelope is the horizontal length and width of the build tray, plus the maximum height the printer is capable of working within. Build time is the time that it takes to print a complete project and is determined not only by the number of parts, but more importantly by the number of layers required.

There are several different techniques for 3D printing. In Fused Deposition Modeling (FDM), a spool of metal or thermosensitive plastic wire is extruded through a heated nozzle. The nozzle melts the build

material and deposits it on the build tray, where it's quickly cooled and solidified. Stereolithography (SLA), Digital Light Processing (DLP) and jetted-resin technology (PolyJet - Stratasys, ProJet - 3D Systems) all use a liquid polymer resin that is light cured. SLA and DLP systems typically have an open reservoir of resin where the part layers are cured by moving or projected light. The jetted-resin systems use micro jets similar to inkjet printers to place resin on the build tray, then pass a curing light over the printed material. Selective Laser Sintering (SLS) and Selective Laser Melting (SLM) technologies use a metal or plastic material that is either in an open reservoir or is delivered to a deposition nozzle where a laser sinters or melts the material together.

The resin-printing and SLS/SLM technologies are most common in the dental industry. They provide dimensional accuracies that range from 30-70 microns in the horizontal part directions and 16-50 microns in the vertical direction. Printer costs range from \$40,000 to \$200,000 for resin-based printers and \$250,000 or more for SLS/SLM machines.

There are four aspects to 3D printing that are often not mentioned: Post-processing, support material, equipment maintenance and maintenance agreements.

It's rare for a 3D printing method to not require some form of post-processing after a print job. Depending on the print technology in use, printed parts may require removal of support material and/or a secondary curing process. Support material is removable material

that fills in the spaces created by undercuts or gaps in printed part. It is used to give the printer a surface to place material on above an undercut. It often can be removed by soaking the printed part in either water or a special liquid solution or by using a high-pressure water spray. Sometimes it may need to be physically cut away from the printed part.

Printers have greater maintenance requirements than most other equipment found in dental laboratories. Depending on the technology, system calibrations, cleaning of print heads, disposal of waste materials or other time-consuming processes are frequently required. Failure to keep up with maintenance can quickly result in lower quality parts or system downtime.

Printer manufacturers often offer maintenance agreements to help laboratories keep their printers in top operational condition. It usually includes some form of annual or semi-annual inspection and cleaning. It sometimes includes a discount on parts or special priority on support tickets. These agreements can add \$500-1,000 per month in equipment operating costs.

3D printing is already here. Models are being printed for digital impressions. Non-precious and noble metals are being printed for fixed and removable prosthetics. In the future, as materials are developed and approved, we can expect to see printed bite splints and removables. There is no doubt 3D printing has a future in our industry. The question is: How far will it go? Only time will tell.





### 3D SYSTEMS PHENIX PXM DENTAL

The PXM Dental printer by 3D Systems, the larger option to the PXS Dental system, delivers large volume printing of very accurate metal parts for fixed and removable dental prostheses in nickel-free Cobalt Chromium. This system is the newest dental printer in the range, capable of producing 200 fixed prostheses in five hours. It has a build volume of 140 x 140 x 100 mm, with an accuracy of 20 microns in 3 axes.

Reported benefits include:

- Reduction of unit production cost
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- Easy to use

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### 3Z MAX

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With one-touch simplicity, the fully automated 3Z MAX printer combines the power of 3D high-precision printing with the increased performance that direct manufacturing requires. Its user-friendly touch screen and software allows operators of any technical level to produce their own high-precision wax parts ready for casting, making the promise of 3D direct manufacturing available to nearly any business.

#### Solidscape

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### EOSINT M270 DMLS

With the EOS M270 DMLS System, dental laboratories can produce bridges, copings and partials directly from CAD data without investment casting. The laser sintering process is faster, more economical and requires only a minimal amount of manual labor. One DMLS manufactures up to 250 individual units in about 11 hours operating unattended. The process requires human operation only for loading and unpacking. This is said to make laser sintering a true industrial production process where high productivity needs consistent quality standards at reduced cost.

#### EOS

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Reported benefits include:

- Simple user interface with built-in touch screen
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### OBJET EDEN 260V

The award-winning Objet Eden260V 3D Printer by Stratasys is widely recognized in the dental industry, winning the "Readers' Choice" award by *Dental Lab Products* magazine. 3D Printing is redefining the world of dentistry, making the transition to digital more affordable and practical. By combining oral scanning, CAD/CAM designs and 3D printing, dental labs can accurately and rapidly produce crowns, bridges, stone models, veneer try-ins, delivery trays, surgical guides and a range of orthodontic appliances.

Reported benefits of the Objet Eden 260V 3D Printer by Stratasys include:

- Produces parts faster with optimal accuracy and resolution
- Eliminates manual work and improve efficiency
- Offers outstanding surface finishes with high resolution on fine details
- Well suited for office and dental environments
- Small footprint
- Cancel out the post-build processing and finishing stages during the 3D printing process

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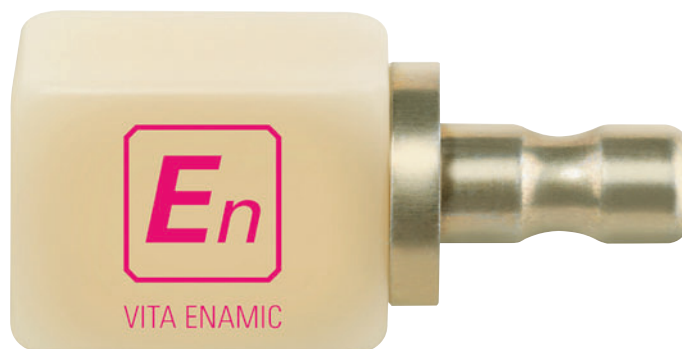
I MADE THAT

# VITA's Enamic

An interview with Enamic's co-developer, Dr. Russell Giordano



**DR. RUSSELL GIORDANO**  
Enamic's co-developer



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The initial research for Vident's VITA Enamic began years ago at Boston University, and Dr. Russell Giordano was there from the beginning. Here, he takes us behind the scenes of this product's development and outlines the benefits of VITA Enamic, a new category of CAD/CAM material and the first hybrid dental ceramic with a dual-network structure that combines the best properties of ceramic and composite materials.

**Q:** What was the idea behind VITA Enamic?

**A:** It's a completely new material with a combination of a ceramic sponge matrix with a small amount of polymer. That created a whole different set of challenges, to make sure we had the proper network with bonding materials that were stiff enough but not too stiff to be used for natural teeth.

One of the issues we wanted to avoid was the problems of composite resins. We also wanted to make sure the material wasn't as stiff or as brittle as a conventional ceramic. It took a number of years to figure out the proper networks with wear properties, with machinability, materials that were stiff enough but not too stiff. There were a lot of properties that had to be examined and a lot of steps.

**Q:** What advantage does VITA Enamic offer over a conventional composite resin?

**A:** A conventional composite resin has individual filler particles. With Enamic, we essentially have a ceramic backbone or a ceramic sponge network. All that ceramic is connected like a sponge and then the pores are filled with polymer. That type of interconnected network is unique. That small amount of polymer gives the material

some flexibility, which improves the machinability and decreases milling time. You don't go through as many burs when you are milling these blocks because they do not gum up the bur. A typical crown mills out in about four minutes; it is usually double for a conventional ceramic. You also don't have the chipping you see with conventional ceramic materials.

**Q:** What was the biggest challenge?

**A:** Figuring out the proper network so we would have the right connection between the ceramic and the amount of polymer in the final material. The whole processing step had never really been done before. You have to compensate for a number of different things that are going on during the curing process, and it took a lot of time to figure out how to do that properly.

**Q:** What feedback have you received?

**A:** So far all the news has been excellent. It has about 6 years worth of clinical trials. The edges are very sharp, so you don't see all the chipping. The surface finish is smoother and you can get away with less tooth reduction, so you can use this material for a lot more cases. And the machining properties are well beyond what we ever imagined when we were making this material.

**Q:** How can labs best incorporate VITA Enamic?

It's something they can jump into. In the area of single units, it's pressing versus milling, which is more cost

efficient. At this point, with the milling speed you can get with this material, it's more cost efficient to mill things than to press them out. You don't have to do any investment. You no longer wax up and you burn out. You just stick the block in, and four minutes later, you have your restoration. In the area of fabricating veneers, you can mill this to 3/10th of a mm and then finish it down to 2/10th in cases where you have minimal preps for veneers. So you also shift your fabrication procedures from conventional, whether it's platinum foil or refractory or pressing, to milling for a veneer in only a few minutes. It is extremely quick and very easy to do.

**Q:** How do you see this product changing the industry?

The initial offering is really a small corner of all the possibilities for the different types of ceramics and polymer combinations. There are a lot of applications for this material, including implant abutments, crowns on top of implants, dentures and frameworks. A whole slew of materials can be made based on this structure by slightly changing some of the variables. There has been some independent testing on different Enamic variations that show you can go even thinner and start to approach 0.5 mm, the same minimum thickness some manufacturers claim for zirconia crowns. There is going to be a shift to materials that contain some sort of polymer because of the resilience and the improved machinability versus conventional ceramics or conventional composite resin. [lab](#)



THE DIGITAL HORIZON

# Making privacy a priority



Make sure your lab meets privacy guidelines in all areas, including a common offender—email.

by Dan Allemeier, MBA

As a dental laboratory, you seldom, if ever, are privy to patient telephone numbers, mailing or email addresses, birth dates, Social Security numbers, medical records or data directly identifying individuals' relatives, employers or household members as part of your dealings with the dental office.

But what you do share in today's digital age are the patient's name, photos showing the patient's full face, and perhaps even insurance numbers where you bill the patient's plan directly for services rendered. All of these are private aspects and should be carefully protected under your patient confidentiality procedures. There is the real issue of protecting the confidentiality of any doctor-patient information, whether on a legal or moral basis. This is irrespective of whether HIPAA (or other regulations like the Health Information Technology for Economic and Clinical Health Act (HITECH) & HITECH Safe Harbor in the USA or the Personal Information Protection and Electronic Documents Act (PIPEDA) in Canada) apply directly.

Some aspects might be considered common sense—such as not including the patient's name on case shipping labels going back and forth between practice and lab; and ensuring unau-

thorized individuals cannot view patient information on a computer monitor or have access to the patient record room. Others are perhaps more complex in today's digital age. Let's look at one example of how information is shared routinely every day, yet is perhaps more vulnerable than we all realize: email.

More than 50 years ago, dental collaboration meant all parties met in the same room to exchange information. As that information was shared verbally and through hard copy files, patient information was safeguarded. Over time, as new technology was introduced, like telephone, fax and the Internet, the exchange of information became less secure. The Internet has revolutionized dental communication as it offers a visual medium that enables collaboration across great distances. With digital high resolution imaging, collaboration was, for the first time since in-person meetings, available immediately to all collaborators. Yet, while that collaboration has enabled improvements in results, it often meant risking patient data by sending it through unsecure means like email or online storage sites.

Take a look around your laboratory. How many times each day are photos, impression files, etc. emailed back and

forth with the patient's name (and other details) shared as identifiers of that particular case? It won't take long before you realize the extent of the information flow—and the potential liabilities that flow with it. Many popular tools like Outlook, Gmail, Dropbox, and other options that are commonly used for patient information sharing are NOT compliant with patient privacy laws.

Today, you should be ready to ensure, and document, that you are compliant with regulations. Consider the following:

- **Access:** Who has access? How can you ensure it is limited to only those who need it and should see it?
- **Transmission:** Is every transmission of patient information secure? To be compliant, data must be secure and encrypted during the sending and storage of the data.
- **Storage:** Can you prove your patients' data is stored securely?
- **Auditability:** Can you track each individual who was able to read, write and delete all patient information?
- **Disposal:** Can you ensure sensitive data is disposed of safely when needed? Typical email systems hold and control the disposal of your private information. To be compliant,

you must have procedures in place to address the final disposal of data.

Are you liable if this patient information is compromised? The answer to that question is beyond the scope of this article. What is clear is: Why take the chance? There are proven solutions available. At core3dcentres®, we have installed Secure-Mail, a feature of Brightsquid Dental Link, to protect the confidentiality of the information we share with our clients.

Secure-Mail is a HIPAA-compliant messaging system designed to enable dentists, specialists and labs to easily and safely share private patient information. Secure-Mail works just like the email tools you are used to, with an important distinction—all your communications will meet compliance standards. And, you can securely send multiple high-resolution photos with every message (attach 500MB to every message).

When protecting the privacy of patient information, the choice is yours. Unfortunately, the long-term ramifications of not doing so properly may not be.

For more information on Secure-Mail, and to have your Patient Information Privacy questions answered by people that have an in-depth understanding and experience with the issue and its resolution, call Brightsquid at 800-238-6503 or visit [brightsquid.com](http://brightsquid.com). **lab**

REAL TIME ROI

# Bringing it all back home

Walter Shin of Seckler Dental Lab explains how the Ceramill system from Amann Girrbach America has let them bring work in-house and keep quality up—even while seeing a return in less than a year.

by Ryan Hamm



## AMANN GIRRBACH AMERICA

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CIRCLE RS NO. 26

SCAN:



## THE LAB

Seckler Dental Lab (SDL) is located in Atlanta. The lab is owned by Walter Shin, who has managed the lab for more than 10 years. With a highly trained and experienced staff of seven, they serve more than 40 clients, primarily focusing on cosmetic work, crowns, bridges and implants. They handle cases from other labs—particularly CAD/CAM work—and clinicians.

## THE PRODUCT

Amann Girrbach's Ceramill system is a fully integrated, modular, open platform CAD/CAM solution that includes the Map400 scanner, the Mind CAD software, the Artex® virtual articulator, the Motion 2 mill, a range of restorative materials and two sintering mill options.

The system's modular approach allows labs to expand their existing system rather than replace the system with each update. The open architecture gives owners the flexibility to work with their choice of open hardware and design files allowing them to share, import or modify .stl files, including those from 3Shape and Dental Wings scanners and the iTero™ intraoral scanner from Align Technology.

The Ceramill system can process an array of advanced materials including Amann Girrbach's proprietary line-Zolid non-veneered translucent zirconia, Sintron® soft millable chrome cobalt, PMMA, and glass ceramics—plus VITABLOCKS® Mark II and TriLuxe forte and lithium disilicate such as IPS e.max.

## THE RESULTS

Seckler Dental Lab has used the Ceramill system for about 16 months.

"We have the full system," says Shin, owner of SDL. "Though it is possible to purchase only a portion of the system, it made the most sense for us to have the entire Ceramill system in-house."

Shin says the move to in-house milling was driven by a desire to make his lab more efficient and more cost-effective.

"We chose to bring our milling in-house because it is extremely time efficient, which helps with our ability to take on more work and produce quality restorations quickly," Shin says. "In-house milling also cuts down on the labor required to produce quality work for our clients."

When it came time for SDL to invest in an in-house milling solution, Shin says they selected the Ceramill CAD/CAM system over others for several reasons.

"I think the Ceramill system has the most complete and comprehensive features and functionality," he says. "Because we have the entire system, we can also maintain complete control over each section of the case, and we know that each tool in the system is going to work ideally with all the other tools. The precision, esthetics and overall quality we're able to get with the system have been excellent."

The Ceramill system has helped SDL achieve what Shin hoped: raise efficiency while decreasing labor demands.





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### Upcoming Ceramill Live Events:

#### September Events

- |                            |                           |
|----------------------------|---------------------------|
| Sept. 19 - Atlanta, GA     | Sept. 19 - Naperville, IL |
| Sept. 19 - Charlotte, NC   | Sept. 19 - Tarzana, CA    |
| Sept. 19 - Cherry Hill, NJ | Sept. 26 - Montreal, CA   |
| Sept. 19 - Hartford, CT    | Sept. 26 - St. Paul, MN   |

#### October Events

- |                           |                            |
|---------------------------|----------------------------|
| Oct. 8 - Charlotte, NC    | Oct. 16 - Orlando, FL      |
| Oct. 8 - Chicago, IL      | Oct. 17 - Charlotte, NC    |
| Oct. 8 - Santa Monica, CA | Oct. 17 - Indianapolis, IN |
| Oct. 9 - Charleston, SC   | Oct. 17 - San Diego, CA    |
| Oct. 10 - Barrie, ON      | Oct. 23 - Boston, MA       |
| Oct. 10 - Irvine, CA      | Oct. 23 - Philadelphia, PA |
| Oct. 15 - Riverside, CA   | Oct. 24 - Melville, NY     |
| Oct. 16 - Buffalo, NY     |                            |



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Walter Shin (left) and assistant Eui Rae Ro (right) stand in front of the Motion 2 mill.

“Since using the Ceramill system,” Shin explains, “the quality, improved efficiency, expanded production capabilities and decreased workload have helped increase our productivity and our profitability.”

In fact, Shin says the return on investment for a Ceramill system is quite fast.

“With the profit increase afforded by the Ceramill system, we were actually able to recoup our initial investment in less than a year,” he says. “We also have a much faster turnaround time, which results in decreased stress and cost—the Ceramill system allows us to do more in a shorter time, and at a high level of quality.”

That mirrors Shin’s initial reason for bringing a milling solution in-house—and he says the preci-



The Ceramill system, which includes (from left to right) the Motion 2 mill, the Map400 scanner and the Mind CAD software.

sion, quality and esthetics they’re able to achieve, even with less time and effort, hasn’t gone unnoticed.

“Clients have been very pleased with the quality of work and quick turnaround times we’ve been able to give them using the Ceramill system,” Shin says.

He notes that their initial customers were often labs who would outsource work to them—but

increasingly, more and more of the business driving the growth of SDL has been from clinicians. Why? He speculates:

“After experiencing the benefits of the Ceramill product we’ve produced, other labs have begun investing in their own Ceramill system,” he says. Perhaps knowing that other labs want to emulate you is the greatest benefit of any new product. **lab**

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ADVICE ON HOW TO SURVIVE AND THRIVE

# The more you know, the better you'll be

Why continuing education matters, and how you can do it in a way that will help your lab.

by Carol J. Pilmer

## FALL 2013 EDUCATIONAL EVENTS

**Sept. 26-28**

NADL University, Tempe, Arizona  
nadl.org

**Sept. 29-Oct. 3**

Pankey Institute Essentials 2, Key Biscayne, Florida  
pankey.org

**Oct. 3-5**

Society for Color and Appearance in Dentistry, Denver  
scadent.org

**Oct. 9-12**

American College of Prosthodontics 2013, Las Vegas  
gotoapro.org

**Oct. 17-19**

Pankey Institute Excellence in Bonded Porcelain Restorations, Key Biscayne, Florida

**Oct. 24-26**

Pankey Institute Couples Leadership, Key Biscayne, Florida

**Oct. 31-Nov. 3**

American Dental Association Annual Meeting, New Orleans  
ada.org

For more upcoming events, visit [dlpmagazine.com](http://dlpmagazine.com) and search "Lab Events"



Carol J. Pilmer

Fall marks a new beginning for the academic world. Fall has exciting academic opportunities for dental labs as well—dental lab techs never stop learning, so the availability of educational opportunities is important to the success of your laboratory. Whether learning new techniques, refining current ones or discovering for yourself whether the newest trend, technique or equipment is a good match for you, your business, your current and potential clients, education is the key to your success.

Expos and trade shows provide a great opportunity to be introduced to the newest, most updated equipment and systems available; it takes a lot of information gathering to make certain your investment will do what you need it to do. Educational experiences run the gamut from informal discussions with peers, to discussions with manufacturer reps and formal education settings.

Local study clubs offer a great way to exchange ideas and learn with like-minded lab owners and technicians. State dental lab associations often provide seminars and programs. From a

national perspective, the National Association of Dental Labs' NADL University, held in September each year, allows participants to gain an advanced level of knowledge about the diverse aspects of management, including strategic thinking and planning in a competitive global environment. Many students return to their labs and grow their gross sales and net profit by implementing what they have learned.

Another option is Vision 21, NADL's other business education meeting held each January. Bennett Napier, NADL's Executive Director, says Vision 21 is a high level meeting that focuses on the business management side of the dental lab business. It does integrate/reference discussions on material and equipment trends and focuses more on how to pay for these trends, make money using them and work on culture shifts within the workforce to adapt.

Dental lab technicians might also want to investigate the Pankey Institute. Pankey Institute offers all its courses to dental lab technicians with the goal of creating excellence in techniques, enhancing a cooperative working relationship and developing a like-minded peer group in a true side-by-side learning environment. Ricki Braswell, Pankey's President and Chief Executive Officer,

cites the Implant Essentials course to be offered later this year as the perfect example. Presenters include restorative dentists, periodontists, certified dental technicians and a board-certified oral and maxillofacial radiologist to provide a well-rounded and practical understanding of how to provide the best care for the patient. Pankey courses are offered year round and technicians are always given generous discounts.

With the advent of the electronic age, online instruction has become popular and offers the opportunity to learn without leaving the work environment. The Internet also is a great resource for discovering educational opportunities that align with you and your goals. Taking advantage of these opportunities can seem expensive and time-consuming at first; but the cost of not being educated can be so much more. [lab](#)

Carol J. Pilmer graduated as a dental assistant from Elkhart University, Elkhart Ind., and spent the first 10 years in the clinical environment. She has been co-owner of R Dental Ceramics, Solana Beach, Calif., for 37 years and can be reached at [rdental@sbcglobal.net](mailto:rdental@sbcglobal.net).

REAL TIME ROI

# One bottle to get a perfect build-up

Lab owner David Tietz explains how Shofu's OneShot Unilayer Porcelain has helped Centric Dental Lab improve its efficiency, bottom line and workflow.

by Ryan Hamm



David Tietz

## THE LAB

Centric Dental Lab is a full-service dental laboratory located in Bullard, Texas. The lab was founded in 1979 by David Tietz as a single-person, crown and bridge lab. Since then, the lab has grown into a full-service lab employing 26 people and offering a variety of services, from PFMs

to CAD/CAM, implants and dentures. Centric's biggest focus is on fixed and removable implants. The lab has been participating in implant work since the late 1980s (working with the Brånemark System) and that remains a large emphasis of the lab's work.

## THE PRODUCT

Available for metal or zirconia substructures, OneShot Unilayer Porcelain is a ceramic material that can improve productivity and esthetic outcomes with a simplified, single powder build-up process. An extension to the existing Vintage MP and ZR product lines, one baking cycle is said to provide a color match for any VITA shade. Additionally, Shofu says that OneShot's densely-packed homogeneous material yields reduced shrinkage versus multiple firing-cycle techniques while allowing one powder to build to full contour.

## THE RESULTS

Tietz has been using OneShot Unilayer Porcelain since June, shortly after it became available in the U.S. "We did some testing for them and we're implementing OneShot more and more into all of our PFM restorations," Tietz explains. "It's made to go on PFM metals or zirconia; there are two different mixtures, one for zirconia and one for metals, and we mostly use the one for metals.



The full Shofu OneShot Vintage MP kit.

If you're doing traditional PFM, it's an easier way to do it—you don't need to have three or four bottles out, you just need one."

Tietz says OneShot has proven to be a key component in helping Centric improve its PFM production, while simultaneously reducing costs. "With the technology of the one-step porcelains where you're pressing and coloring, OneShot is an easier way to produce," Tietz says. "Plus, your cost of inventory is down since you only have one bottle as opposed to having one for each shade."

Reducing the number of bottles on the shelf is one of the primary reasons Tietz is happy with the OneShot Unilayer Porcelain: it's helped bring his overall costs down, while actually increasing the amount of porcelain work Centric Dental Lab is able to produce.

"Any time you can lower your inventory and produce multiple products with the same material—and from the same bottle, that is good. [OneShot] is an easier way to produce, it's faster and it's easier to train a technician." Each of these things, Tietz says, helps make his bottom line that much better.

Also helping his costs is the fact that OneShot has helped to increase his productivity. Because it makes training easier and only requires one bottle instead of multiple build-up powders, it has enhanced the flow of the lab. "It should make anyone's workflow increase," Tietz says.

Tietz notes that, despite being a single-bottle solution, he's also very happy with the esthetic results he's received with using OneShot. "The translucency is really nice—the doctors have been happy with it," Tietz says.

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CIRCLE RS NO. 29





COMPETITIVE

# Edge



The Shofu OneShot Vintage MP Unilayer porcelain (also available in Vintage ZR for zirconia).

“Any time you can lower your inventory and produce multiple products with the same material, from a cost standpoint that makes it good.”

—David Tietz

“All of the VITA® classic shades match up really well.”

Doctors agree with Tietz’s assessment of OneShot. How does Tietz know? No one has complained! “Everything’s OK—no news is good news,” Tietz says with a laugh. “But the doctors that come into the lab see us producing with the OneShot, and they’re happy with it and know what they’re getting is going to be a quality product.”

In the end, Tietz finds that OneShot helps him save money, time and headaches, but above all, it helps him maintain the quality he values in Centric Dental Lab. “OneShot helps us with our ongoing commitment to quality,” he says. “It allows us a different avenue to get our production costs in line and combat rising costs.” Which, in the end, is what every dental laboratory owner is looking for. **lab**

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REAL TIME ROI

# Straumann USA's CARES CAD/CAM

How Straumann USA's CARES CAD/CAM allows Dickerman Dental Prosthetics to keep all of its solutions in-house.

Compiled by Ryan Hamm and Stan Goff



Straumann's prosthetic portfolio contains an expansive range of stock and customized abutments and customized tooth-borne solutions.

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CIRCLE RS NO. 31

SCAN:



Ira (left) and Brandon Dickerman

## THE LAB

Ira Dickerman and his father are co-owners of Dickerman Dental Prosthetics in Sharon, Mass., a full-service dental laboratory that has been in business since 1965. Ira is proud to be part of a three-generation business that includes his dad, who is 80 and who still comes in and works at the bench every day; himself, who does most of the operations of the business and talks with the doctors on the phone; and his son, Brandon, who has been with the lab for four years and has been able to bring the digital side and a younger

perspective to the business. Brandon is the guided surgery specialist at the lab working with the Dental Wings coDiagnostiX™ & gonyX™ system along with assistants at the laboratory. He also handles all of the scanning and other jobs involved with the Straumann CARES abutments.

## THE PRODUCT

Straumann's prosthetic portfolio contains an expansive range of stock and customized abutments and customized tooth-borne solutions. Its CARES abutment portfolio is available for bone-level and tissue level Straumann Implants. Abutments are available in 3 material choices to meet the demands of labs' markets: ZrO<sub>2</sub>, Ti and a Ti-alloy base. Only Straumann offers original, authentic Straumann CARES CAD/CAM

Abutments—each abutment ships with a material composition sticker so you know you're receiving an original Straumann component.

The CARES CAD/CAM portfolio features a leading range of monolithic materials including the full-contour zerion® HT (high translucency) solution for crowns and bridges\* (up to 3 units). Additional metal and temporary materials are available for a wide array of solutions from single crown to screw-retained bars and bridges.

## THE RESULTS

Dickerman Dental Prosthetics services about 150-175 clients a month. Much of what Brandon does is the guided surgery aspect of things, but he's also getting

introduced to the CARES Abutments and scanning protocols. Ira, meanwhile, has long been a fan of Straumann CARES.

"I have always maintained, and Straumann has made a big push on their marketing, that it's critical to have genuine products on genuine parts when restoring dental implants," Ira says. "Although we have only had the CARES scanner in the laboratory for about four-to-five months now, we had been outsourcing our abutment fabrication for the Straumann system. We have been using CARES since it was available. We didn't necessarily do the scanning and designing under our own roof, but we have always used the CARES system."

Once it was clear that outsourcing was no longer ideal for the lab, working



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with all of the Straumann systems was an easy choice.

“What made me move is the fact that I am going to get a better return on investment than I would have a few years ago,” Ira explains. “The Straumann system, as people that restore a lot of Straumann implants understand, started as a tissue level system, and about four-to-five years ago, they brought out bone level implants [which] lends itself much more to use in custom abutments and that area of our business has grown in terms of restoring Straumann implants. So what prompted me to bring it in-house is the fact that I am able to not outsource, I have a large enough volume of the product line that I can get a return on my investments and cut out a middleman, so to speak.”

The lab currently has four scanners, including the Straumann CARES scanner used exclusively for fabricating abutments for the Straumann system.

“What I find attractive about the Straumann CARES system is that they have a really broad-based portfolio of products that they are offering. Although we press e.max, we could have e.max CAD milled by Straumann, or we could have Lava Ultimate milled by Straumann if we want it,” Ira says. “We have the opportunity to have frameworks and structures made, and we will have an opportunity to do bars. We are doing more and more hybrid frameworks, fixed cases, and more complex cases where we put four, five or six implants in, make a framework and a fixed prosthesis with denture teeth. Since the economy started to turn around, we will see more of those kinds of cases and those could all be done with Straumann CARES system on the Straumann interface.”

Brandon adds: “We have always had a really phenomenal result with this, and we never had any issue with any of our Straumann products. For technical support, Straumann has been very good and very supportive of getting us the results we need. If there are any issues, they are really great about jumping on our computer, walking us through any issues that we may have or teaching us new things.”

This is something Brandon is happy to take advantage of when needed. “That has been a really nice resource because it’s easy for me to pick up the phone and within a minute or so, they are on my computer showing me exactly how to make any changes to what I am doing incorrectly or showing me some new technique,” the younger Dickerman says. “That’s something that they really excel at that we have been able to utilize.”

Ira has worked with a variety of CAD/CAM systems, but likes what Straumann offers to his lab.

“The Straumann system is a one-stop solution. At least with this system, whatever happens, they are responsible for and they get you to the end product,” Ira says. “I think especially for the smaller dental laboratory—and we have 20 people so we are in the midsize range—for the small dental laboratory whose time

is limited, who is working too many hours a week, I think that having one place to get all your information, especially when you want to get a big variety of products like temporaries, like CAD/CAM, like chrome cobalt, it is a plus and it’s important.”

Straumann also makes sure its customers are well-trained, Brandon says. “We took a three-day intensive training course that went through every aspect of the software, just kind of touching on things, showing what they can do, and it was kind of an introductory course that opens your eyes to what’s available for you,” Brandon says. He added that the company website is also a great resource, featuring several tutorial videos that explain the different features of different products.

Ira says the Straumann technology has improved his workflow. “It allows me, because I have my own scanner, to save a couple of days because I can scan something even late on the day that the case comes in and now I am not shipping a wax-up to another party,” he says. “They have to get it, they have to work it into their schedule, be able to scan it, so that makes it a lot simpler when you keep it under your own roof.

“Not only do we have more control, we have more understanding. When you are working with an outsource person or laboratory and they call you up, there may be some confusion about what we’re asking for. Either you think that maybe they don’t know what they are doing or you don’t understand why not and you can learn from them. When you are bashing your head against the wall yourself and you call Straumann and Brandon gets on the phone, they will say ‘Well you want to make an abutment that’s got a contour that comes out too far, but the implant is here and the contour goes out there, and that’s outside our milling block.’ They show you that and explain; the educational progress is much better and you learn much more.”

Ira suggests other laboratories give Straumann CAD/CAM a try. “I think they should consider investing in the CARES system if they can justify the expense of the scanner based on how many implants they restore on an annual basis and how much the savings is going to be over using a third party, because part of the impetus this year to buy the CARES scanner was, I was sending out so many abutments that I was spending more money than having the equipment under one roof.” Ira says. “It costs me time by paying our staff or Brandon to do the work on the scanner, but I am still able to keep it in-house under one roof. We do a lot of the guided surgery work and we made a conscious effort to purchase digital guided surgery service, because we do a lot of Straumann implants in this area, and [as] part of buying the system our hope is that the approach, which we have always wanted as restorative people, is to be what’s called top down treatment planning. It is to design the crown.” **lab**

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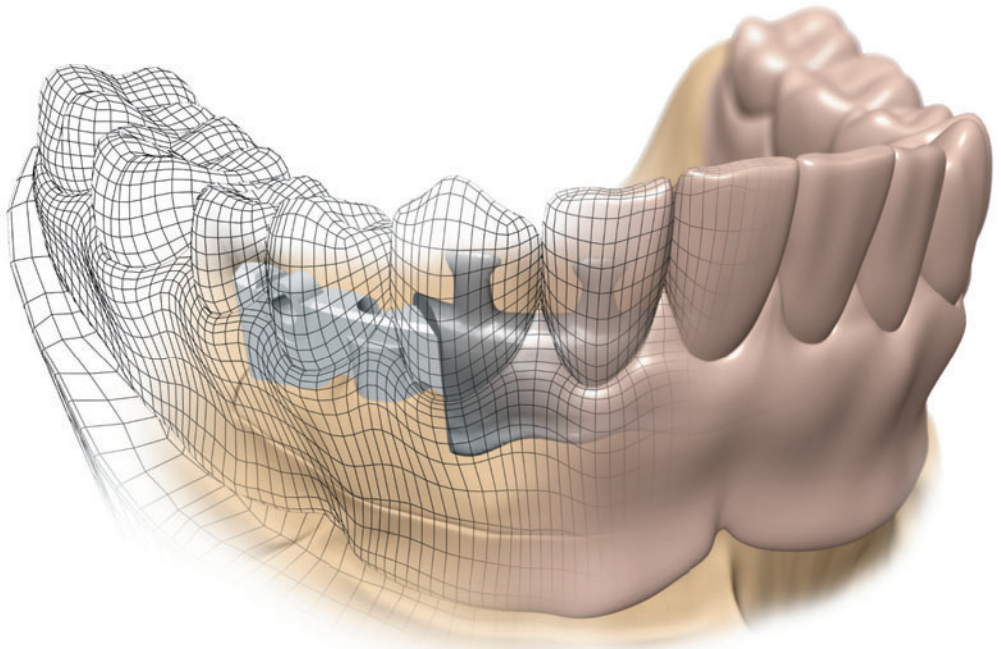
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### SCAN:



# A new benchmark in implant suprastructures

Addition of ATLANTIS ISUS further expands DENTSPLY Implants' solutions.

Information provided by DENTSPLY Implants.

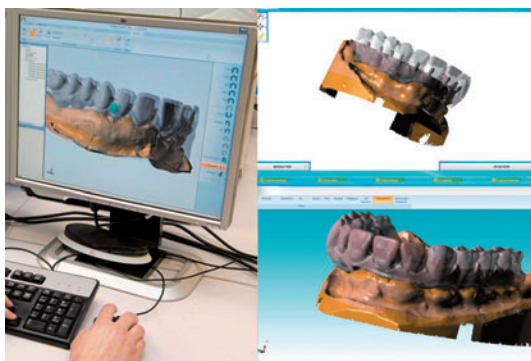
DENTSPLY Implants further expands their ATLANTIS™ solutions to now include ATLANTIS™ ISUS, a full range of implant suprastructures for fixed and removable dental implant prostheses, in addition to the already existing line of patient-specific abutments. Available for all major implant systems, ATLANTIS ISUS bar, bridge and hybrid solutions are produced using the latest developments in CAD/CAM technology, and supported by computer-based industrial and medical device expertise.

ATLANTIS ISUS was designed to allow a dental laboratory to expand its implant solution offering to its clinicians while helping to eliminate the additional

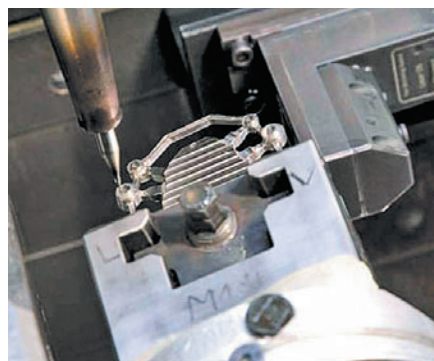
labor often associated with providing traditional implant suprastructures.

For example, time formerly needed for casting multi-unit constructions can now be spent on creating final esthetics. In addition, unlike cast suprastructures, ATLANTIS ISUS suprastructures are milled from a choice of solid blocks of titanium or cobalt-chrome, eliminating the potential for a porous material. Milling strategies for the implant suprastructures have been optimized to ensure a precise, tension-free fit—all backed by a comprehensive 10-year warranty\* for added peace of mind.

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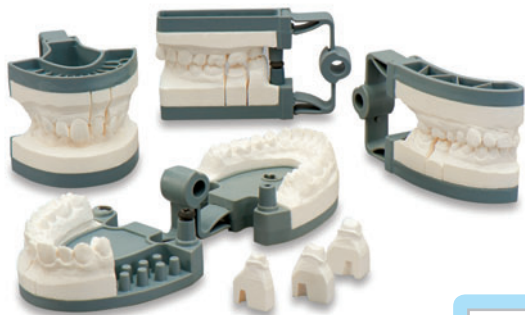
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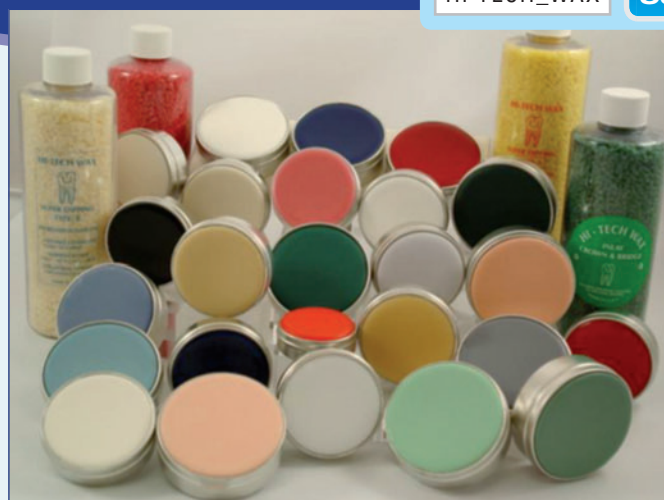


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**01. What was it you were hearing from the lab industry that led to the development of Evident software?**

Having worked with desktop software for many years, the Evident directors were ready to get into the cloud. Dental lab employees should not have to be computer technicians. With Evident, lab staff do not need to install, update or back up. Our technical support staff can see the lab software and data files, making problem solving infinitely easier. The other thing we wanted was paperless production management. With Evident, lab staff have access to everything they need, all of the time.

**02. What have you seen in terms of adoption of the cloud model among dental labs?**

When we started out, we had to sell the cloud. Now people understand the benefit of letting us spend the money on big hardware so they don't have to. They know they don't have to worry about mixed computer hardware and operating

systems, they enjoy access through tablets and smart phones, and they appreciate being able to access their system from absolutely anywhere there's Internet. People used to worry about us being down but most now realize that a desktop system is down a lot more—we're up better than 99.9 percent of the time.

**03. What do you see as Evident's greatest strength?**

Evident is comprised of a group of people who are passionate about what they do. As a result, our code is rock solid, we get rave reviews for our customer support and we consistently provide the features customers need now and in the future. We're a group of people who enjoy what we do and sincerely want to help.

**04. Who is your target customer at Evident, and how do you feel you best meet their needs?**

Evident is designed to centralize information. Our target is labs that want to use our features to automate as much as they can. We have the feature set large labs require, but we love to work with small- and mid-sized labs that embrace this concept.

**05. Why should labs that aren't currently using cloud-based software consider an option like Evident?**

To be competitive, labs need to focus their energy on their customers, their products, their staff and their business. By passing a lot of technical responsibility to us they can focus on their own operations. Our billing model is subscription-based with no contract. That means we have to keep labs happy to keep them as customers. Desktop systems require a big upfront investment before the lab really knows if they've made the right choice.

**06. What differentiates Evident from other cloud-based offerings?**

Three things stand out: 1. Evident is the fastest cloud-based system out there. Speed is surprisingly important—waiting for a second

here or there may not seem like a big deal but over time, it adds up. 2. Billing is consistent, which makes budgeting easier. Evident bills a fixed amount each month—it is not based on the lab's revenue. 3. Evident has the feature set big labs need—many of the small and mid-sized labs understand that those features can help them either now or in the future. Why not start with a system you can grow into?

**07. What advice do you offer to labs in terms of making sure their data is secure?**

Do your homework. The Evident servers have a three-tiered system that prevents loss of data and security. When moving to cloud-based systems, don't be afraid to ask how the data is stored and what systems are used.

**08. How is Evident helping labs of all sizes—from small, one- to two-person labs to much bigger labs?**

For small labs, the challenge is maximizing time at the bench and reducing administrative tasks. Evident makes case tracking, billing and payments easy and documents are clear and professional. Large labs want to provide the quality and customer service of a boutique lab while managing many more people and much more information. Evident also has built-in compliance and legislation features that reassure all labs that they can handle whatever requirements arise.

**09. What about labs that are nervous about not having their data or financial information "on-site"?**

"On-site" data is the most easily stolen. In most labs, an employee takes a copy of the data file home every night to provide an off-site backup. That is about the least secure data imaginable. Theft, fire and computer hardware failure are all threats to on-site data. Many labs do not test their backups and when they do need to restore, find out that backups haven't been working for months. Evident is redundant and always accessible to the lab. They can log-in to a backup any time they want to be assured it is working and accessible.

**10. What can we expect from Evident in 2013 and beyond?**

Evident is known for its powerful features—our next step is to transform the interface to make it even easier to use. We love talking to our customers but strive to make setup easier and easier so we can spend more time talking to them about how to translate their management goals into reality.

"We have the feature set large labs require, but we love to work with small- and mid-sized labs."

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