

14

LMT LAB DAY East 2022:
Back in the New York Groove

18

Product Focus:
Mills and CAM Software

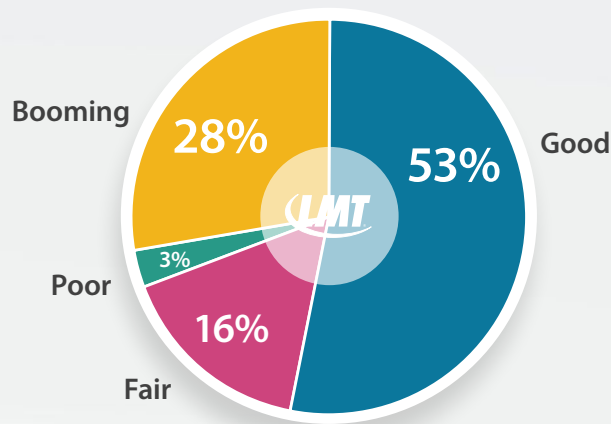
LAB MANAGEMENT TODAY

NOVEMBER/DECEMBER · 2022



BUSINESS STRATEGIES FOR DENTAL LABORATORY DECISION MAKERS

Dentures and Partials in High Demand, Market Looks Bright



The results of LMT's exclusive 2022 *Removable Prosthetics Survey* are in! Among the good news: 81% of lab operators say their complete denture business is "good" or "booming."

Turn to page 8 for complete survey coverage

Technician Realizes Longtime Dream of Lab Ownership



Todd Reid (center) and family at the ribbon-cutting ceremony for his new lab, Access Dental Laboratories in Syracuse, NY. The 3,600-square-foot building is a dream come true for Reid.

Turn to page 42 for a look inside

Technician's Gallery:

Readers Share Their Favorite Cases of the Year



All technicians have a case now and then that stands out to them, whether it's because of the challenge they addressed, the patient they helped or the dazzling results they achieved. Inside: 12 readers share their favorite cases from the past year.

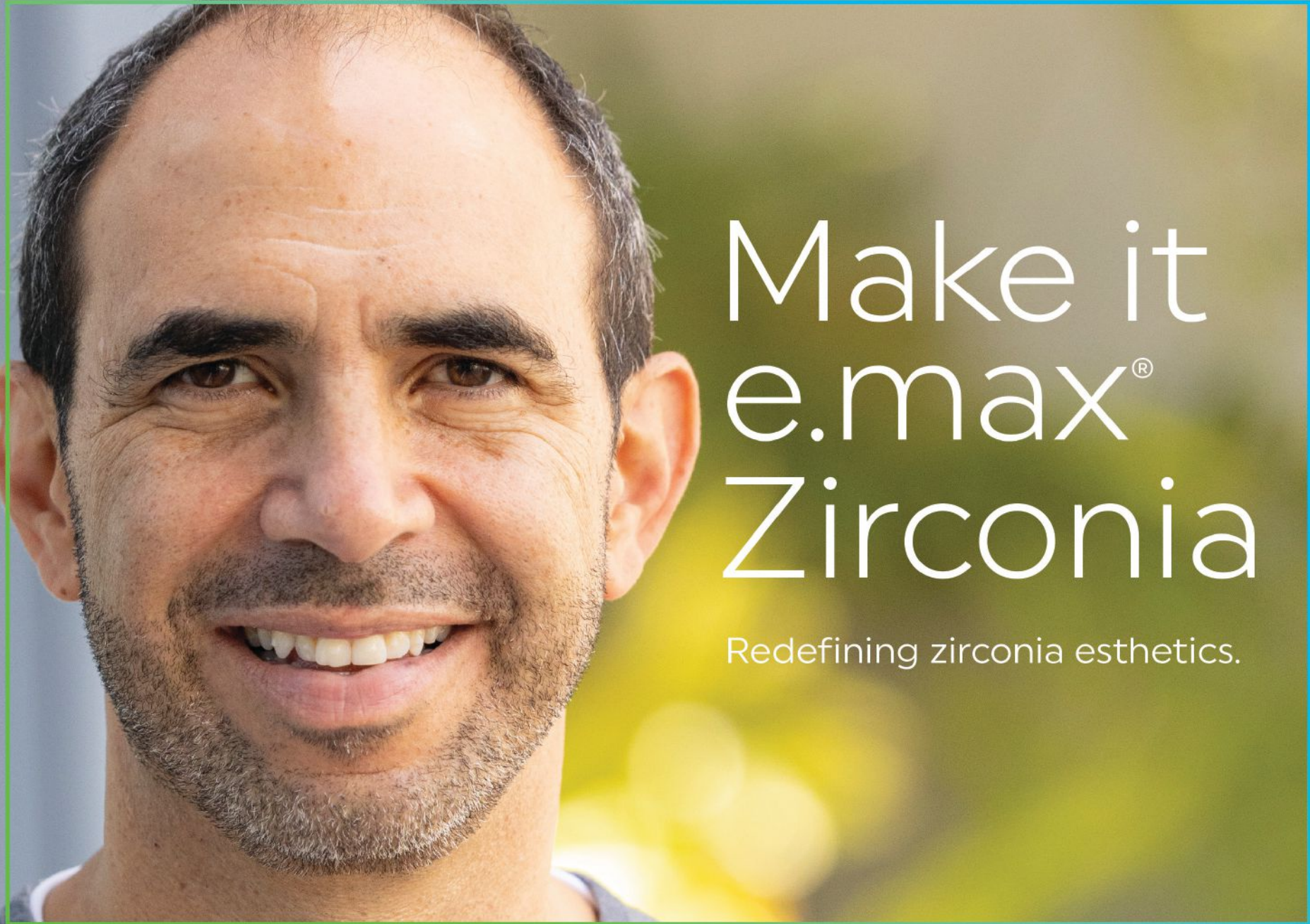
Turn to page 32

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rafael santrich



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Readers Share Their Favorite Cases of the Year



See page 32

strategies & essentials

- 04** Publisher's Page
- 06** Newsbriefs
- 08** Dentures and Partials in High Demand, Market Looks Bright
- 14** LAB DAY East 2022: Back in the New York Groove
- 18** Product Focus: Mills & CAM Software
- 26** Panthera Celebrates Master Cup Winners, 10-Year Anniversary
- 32** Readers Share Their Favorite Cases of the Year
- 35** Today's Products & Services
- 36** 3D Printing: At the Beginning of the Journey, Endless Possibilities
- 38** LAB DAY Chicago: February 23-25
- 40** Classifieds
- 42** Technician Realizes Longtime Dream of Lab Ownership

DISPLAY ADVERTISING INDEX

3D Systems	14	Glidewell.....	7	Preat	8
3DBioCAD	20	Haus Milling Center	9	ProLab Solutions, Inc.....	10
Alien Milling Technologies	Cover 3	HeyGears Inc.	11	Ruthinium	12
Aspen Dental	30	Hunan VSmile Biotechnology Co., Ltd.....	28	Seattle Bioceramics.....	24
Astron Dental Corp.....	21	Integrity Dental Services.....	25	TruAbutment Inc.....	5
Atlanta Dental Supply.....	6	Ivoclar	Cover 2	UP3D Tech (USA) Inc.	19
Aurident.....	Front Cover	Keystone Industries	23	Upcera Dental Technology Co., Ltd.....	27
BEGO USA, Inc.....	29	NADL.....	31	Zahn Dental, a Div. of Henry Schein, Inc.....	Back Cover
China Orthodontic Laboratory	17	Opulent Digital Specialists.....	18	Zhermack, Inc.	35
DentalTechnology.com.....	33	Pac-Dent, Inc.	16	Zirkonzahn USA, Inc.	15 A/B
FullContour by 3Shape.....	13	Panthera Dental.....	22		



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Innovative Personnel Policies: Food for Thought

The labor shortage continues to impact industries of *all* types; consequently, companies are continuously evolving their employee recruitment and retention initiatives to gain a competitive edge.

A look at the latest human resources trends may spark ideas for adapting similar policies in your laboratory. Here are some of the newest out-of-the-box strategies and high-tech tools being used:

Instant paychecks. Employers like Taco Bell, Big Lots, Dollar Tree and Kroger give employees the option to withdraw money from their paychecks moments after finishing their shift by using smartphone apps like Branch, DailyPay or Dayforce Wallet.

Most of these apps are software add-ons to existing payroll systems like ADP and employees simply download the app and log in using an email or phone number. The app shows workers how much cash they're earning as their shift progresses and allows them to transfer wages to a connected bank account; taxes and other disbursements are automatically deducted.

Emergency savings. The financial stress of the last few years—including the pandemic and rising inflation—is making rainy-day funds one of the newest job perks. Companies like ADP and Starbucks are helping employees set aside savings for unexpected expenses using services like SecureSave, which automatically transfers after-tax funds from workers' paychecks to savings accounts at a partner bank.

According to SecureSave, the average employee saves \$38 per paycheck and employers typically match four dollars per paycheck. Workers can track balances and transfer funds with a mobile app and then withdraw funds when they're needed; although the most common claims are related to car/transportation expenses, money

can be withdrawn for any reason.

Vacation bonuses. Paid vacation days are good but some employers are taking it a step further and giving workers money to help offset the cost of their trips. At Denver-based tech company FullContact, employees with good performance records get a bonus on each work anniversary to use toward a vacation. The amount—which depends on the employee's tenure—starts at \$2,000 and maxes out at \$7,000.

"Quitting" bonuses. This cut-your-losses approach weeds out the less committed brand-new employees by offering them money to leave their jobs if they feel it's not the right fit. For example, software company Trainual offers employees up to \$5,000 to leave after the first few weeks.

"It's important to know really quickly if we've found the right people," Chris Ronzio, CEO told *Forbes* in January. "If someone knows a week or two in that this is not their long-term place or position, it gets more expensive to replace them as they take on more work and responsibility."

Employee engagement apps and platforms like MS Teams and Slack have become mainstays in many companies but there is a diversity of other mobile workplace technology dedicated to connecting and motivating employees. These apps often feature engaging content and graphics, real-time notifications and "social" features that allow likes and comments. A few examples:

- WeThrive and Culture Amp enable you to survey employees and receive an analysis of results and suggestions for improving engagement and retention.

- With recognition apps like Kudos or EngageWith, employees can acknowledge co-workers going the extra mile, earn points and drive appreciation and teamwork.



- To support new hires, Lessonly is an eLearning platform that can help with training; Enboarder facilitates new employee orientations with tours, intro videos and more.

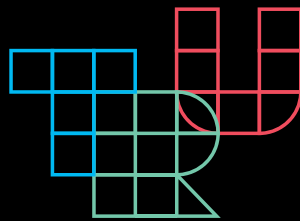
Gamification. This growing trend uses game-like elements—such as scoring points, earning rewards or advancing levels—in a digital environment to enhance work performance, compliance with tedious administrative tasks and training initiatives. For example, in an effort to encourage executives to complete its leadership training program, accounting firm Deloitte introduced gamified elements such as badges, leaderboards and status symbols. Within three months, the executives time to complete the program dropped by 50%.

Walmart has gone super high-tech, training over a million of its associates using Virtual Reality headsets; modules cover things from how to operate an order kiosk to active shooter training. Because the technology has helped reduce training time, Walmart estimates that VR has returned over a million full days of work.

P.S. For industry-specific strategies, see LMT's *February 2022 Personnel Issue*: bit.ly/LMTpersonnelissue.



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tables; a keynote presentation on change by Garrison Wynn, CSP, Wynn Solutions; lectures on talent acquisition, building culture, developing leaders and marketing; NADL Awards ceremony and reception; and more. To register, visit nadl.org/events/v21/2023/. ■

Consolidated Metal Products, LLC Selling CMP Alloys, Garreco Denture Products

Consolidated Metal Products, LLC, formed in the fall of 2022, has purchased the line of alloys from CMP Industries—which dissolved in May 2022—and is now selling them through its online store. Located in Scottsdale, AZ, the company's offerings include Ticonium partial alloys, Nobilium hard ingot alloys, Nobilium partial alloys, NobilStar cobalt-chromium RPD alloys as well as Garreco investments, colloid, acrylics and other denture-related materials. To learn more, visit consolidatedmetalproducts.com. ■

exocad Upgrade Offer Ends December 31

exocad, an Align Technology, Inc. company, is offering a limited-time offer: exocad customers with a DentalCAD perpetual dongle activated before August 31, 2022, can take advantage of the "Upgrade to Ultimate offer" that allows them to upgrade to an Ultimate Bundle for a one-time fixed fee, regardless of how old their software licenses are or how many modules have been activated. Ultimate Bundles provide

the largest range of included exocad modules. Customers receive an upgrade to the most current software release, DentalCAD 3.1 Rijeka; a license equipped with all Ultimate Bundle DentalCAD modules; and access to the next generation DentalCAD software within the next 12 months. The promotion is valid until December 31, 2022; contact your preferred reseller or promo.exocad.com/trade-up-2022 for details. ■

Benco Distributing Medit Scanners

Benco Dental is now offering the complete line of Medit intraoral scanners, including its i700 and T-series models. The scanners are also on display to test-drive at Benco's CenterPoint showrooms in Texas, California and Pennsyl-

vania. "Partnering with Medit is the best of all worlds for customers seeking the most flexible, compatible, advanced and high-value scanning products," says Lisa Fleming, Benco's Digital Dentistry Manager. Visit benco.com. ■

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Movers & Shakers

Dentsply Sirona welcomes Andreas Frank as Executive Vice President Product Group and a member of the Executive Leadership Team to lead its consumables, implant and clear aligner businesses. Frank previously held leadership roles at Baxter, Hillrom and Danaher Corp.

The company also appoints **Glenn Coleman** as Executive Vice President and Chief Financial Officer, succeeding **Barbara Bodem**, who has served as Interim CFO since May and remains with the company. Coleman has 30 years of financial management experience, most recently as CFO at Integra Lifesciences. ■



Coleman



Frank

Jenmar Software Rebrands as EasyRx VisualDLP

Acquired by EasyRx in 2019, Jenmar VisualDLP cloud-based lab management software is being rebranded as EasyRx Visual DLP. The software also has a new logo and website address, easyrxcloud.com.

"Rebranding to EasyRx VisualDLP completes our initiative to develop the only universal lab prescription, digital workflow and



comprehensive lab management solution in the industry, allowing practices and labs to connect and work together seamlessly," says Todd Blankenbecler, President and CEO of EasyRx. ■

Keystone Resins Validated with LuxCreo Printers

LuxCreo's iLux Pro and Lux 3D+ Smart Factory 3D printers with LEAP™ Platform and Digital Polishing™ are now compatible with Keystone's KeySplint Soft, KeySplint Hard, KeyOrtho IBT and KeyGuide 3D resins.

"We are thrilled to partner with Keystone Industries and share

our findings that LuxCreo's Lux 3D+ and iLux Pro Smart Factory Dental 3D Printers simplify digital dentistry with Keystone Key-Print resins," says Michael Strohecker, Chief Revenue Officer, LuxCreo.

For details, visit keystoneindustries.com or luxcreo.com. ■

In Memory: Karl Wagner

LMT is saddened to report the passing of 75-year industry veteran Karl Wagner, Owner, Wagner Dental Lab in Danbury, CT.

Wagner began his career as a technician in 1947 at his neighbor's dental lab in his native Hungary. In 1956, he emigrated to the U.S., joined Brenner Dental Lab in Danbury, CT, and, in 1979, purchased the lab and renamed it Wagner Dental Lab. Up until his passing, Wag-

ner worked five days a week, seven hours a day fabricating dentures and working with his local hospital's dental/teaching clinic. LMT featured Wagner as part of its June/July Inspiration Issue; to read his profile, visit LMTmag.com/karl-wagner. ■



For complete details on upcoming seminars, trade shows and other industry events, visit LMTmag.com/events.

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Dentures and Partials in High Demand, Market Looks Bright

The results of LMT's exclusive 2022 Removable Prosthetics Survey are in. The market looks bright thanks to the aging baby boomer population, limited number of skilled technicians and patient demand for economical restorations. **By Kelly Fessel Carr, Associate Publisher/Editor**

We've said it before and we'll say it again: removable prosthetic labs and departments are thriving, thanks largely to the aging baby boomer population, limited number of skilled technicians and patient demand for economical restorations. In fact, about 80% of respondents to LMT's 2022 Removable Prosthetic Sur-

vey rate their current complete denture and partial denture businesses as "good" or "booming" and more than 50% say business has improved in the past five years. (See charts below.)

"After the Covid shutdown in March and April 2020, we had our best production months ever and demand for dentures has stayed

high since then, although August, when children return to school, was slow as always," says Diane Hughes, Owner, Oak Tree Dental Lab, Worthington, OH.

Tony DeAngelis, CDT, Owner, Depot Dental Lab in Wooddale, IL, echoes her sentiments. "Business is currently wonderful and has been for some time. As a den-

ture lab, my workload has been increasing for sure. I'm now getting work from C&B labs that don't do removable work: six new accounts in the last five months!"

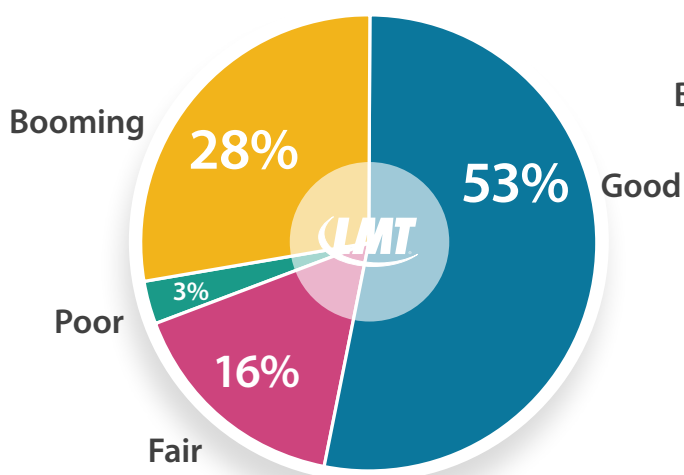
In addition to a strong business environment, here are five other notable trends in the marketplace:

1. Fifty-five percent of our survey participants say the number of complete dentures prescribed by their dentist-clients has *increased* in the past five years. In particular, they've seen significant demand for implant-retained overdentures; complete dentures with whiter, brighter teeth; and hybrid dentures.

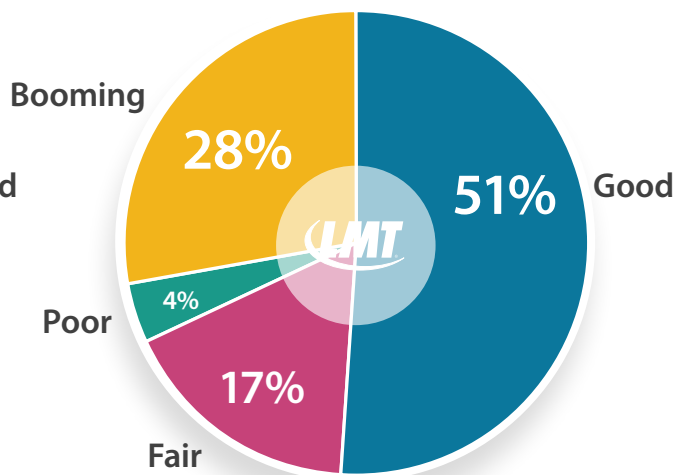
2. Milling and printing technologies continue to impact complete denture production. The percentage of labs digitally fabricating complete dentures has increased 15 percentage points—from 8% to 23%—in the past five years, according to a comparison of LMT's 2017 and 2022 Removable Prosthetic Surveys.

Continues

81% of Operators Say their Complete Denture Business is 'Good' or 'Booming'



79% of Operators Say their Partial Denture Business is 'Good' or 'Booming'



SOURCE: LMT Research Dept. ©2022

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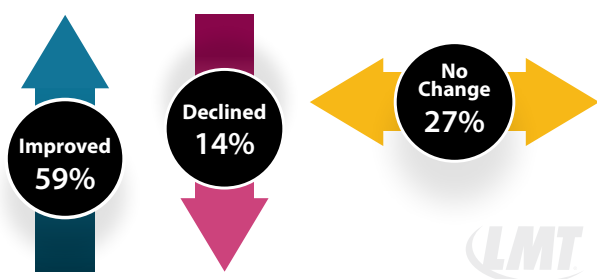
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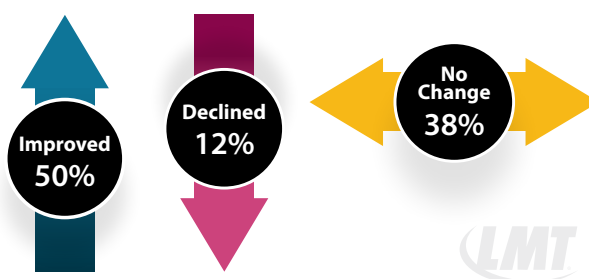
(FROM DESIGNED STL)

Change in Complete Denture Business in the Last Five Years



Nearly 60% of lab operators say their complete denture business has improved since 2017.

Change in Partial Denture Business in the Last Five Years



Half of lab operators say their partial denture business has improved since 2017.

SOURCE: LMT Research Dept. ©2022

Continued

Of those who are fabricating complete dentures digitally, 46% are using a combination of milling and printing technologies, 42% are printing them and 12% are milling them. The majority say the quality of digital dentures has increased in the past several years, noting there are more systems on the market and better materials, especially stronger, less brittle printing resins.

However, although more labs are on board with this technology, digital dentures still only make up 5% of their average denture workloads. “Digital denture materials have improved but it's still an interim-quality denture. Scanning intraorally is problematic at best. It's still an emerging technology,” says a department head in a denture/partial lab in the East North Central region. As in the past, the vast majority of conventional dentures are still fabricated using the packing technique (see chart on page 12).

3. In the partial denture arena, digital technology is also making inroads. The percentage of labs designing their frameworks digitally has doubled in just the past two years, from 17% to 34%, according to a comparison of our current survey to our 2020 *State of the Industry Survey*. This 34% digitally design an average of 62% of their frames.

The jury is still out on the quality of digital partial design and the consistency and fit of the final product. Some users say the quality is “just as good if not better than by hand” while others say, “even bad analog is way better than digital.” However, proponents and opponents do agree that accurate scan data and skilled designers are key to the success of a digital partial.

4. Among respondents who offer partial dentures, nearly half say prescriptions for partial dentures—especially flexible partial dentures—is on the rise. “I

Continues



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Techniques used to Fabricate Complete Digital Dentures:

- 46% use a combination of milling and printing
- 42% use printing only
- 12% use milling only

SOURCE: LMT Research Dept. ©2022

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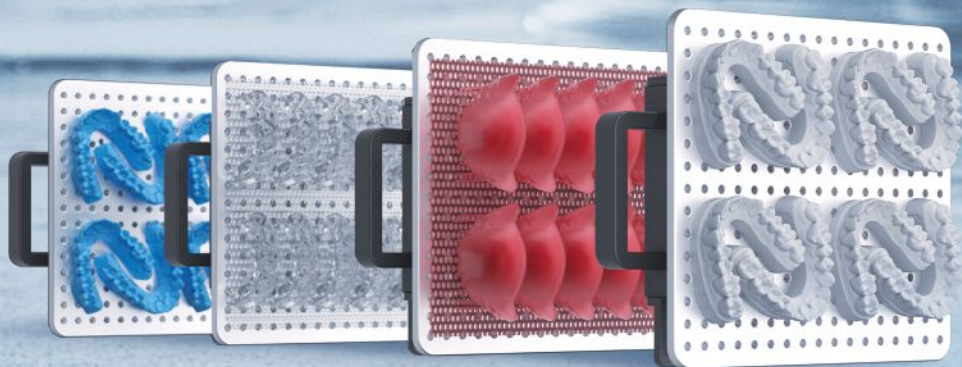


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Breakdown of Average Partial Denture Caseload:

- 61%** are cast partial dentures with a conventional waxup
- 22%** are flexible partial dentures
- 7%** are cast partial dentures with a 3D-printed waxup
- 7%** are partials fabricated via SLM
- 3%** are milled partials



Breakdown of the Average Fabrication Methods of Complete Dentures:

- 62%** are made with the packing technique
- 16%** with the injection technique
- 16%** with the pour technique
- 5%** with digital technology
- 1%** with microwave technology



SOURCE: LMT Research Dept. ©2022

23% of respondents offer digitally fabricated complete dentures; another 14% plan to do so within the next year. Among those who offer digital dentures, 78% say the quality has increased in the past three years.

Continued

used to do 10 to 20 flexibles per year. This year, I've done 300-plus because my dentists are prescribing them more frequently," says Erin Marks, Owner, Finer Detail Dental Lab, Midland, MI.

Despite the growth in the flexible partial market, partial dentures cast from a conventional waxup are still the most common, comprising an average of 61% of respondents' total partial caseloads (see chart at left).

In addition to ongoing pricing pressures and chronic lack of trained prosthetic technicians, a more recent challenge in the removable market has emerged: supply chain issues due to the pandemic, discontinued product lines and companies being hard to reach. Backorders on products such as teeth, base plates, custom tray material and wax have left labs struggling to get supplies.

On the Horizon

Despite the challenges, many lab operators are optimistic about the future of the removable prosthetic market, especially the next decade while the baby boomer population is still substantial. They predict continued growth as a result of supply and demand: the declining number of technicians creates opportunity for those who stay the course, coupled with patients seeking a cost-effective alterna-

tive to C&B. "People will always need to replace their teeth. Those who cannot afford implants will opt for flexible partials or cast metal partials," says an owner of a small denture/partial lab in the East North Central region.

They're also encouraged by younger dentists who are patient focused and eager to partner with the laboratory. "I think the future looks bright because the newer doctors are good at collaboration and want to learn about the products and services available to them," says a manager of another small East North Central removable prosthetics laboratory.

And just as digital technology transformed C&B production, many see the future of the removable prosthetic market as becoming increasingly digital, albeit slowly. They believe that as materials improve and scanning technology for edentulous patients evolves, digitally fabricated prostheses will ultimately become the standard of care.

"Digital will eventually take over, just as acrylic replaced vulcanite," says Scott Splaingard, CDT, Owner, Dental Designs Lab, Granite City, IL. "It will take years and there are still millions of acrylic dentures out there to service and repair in the meantime."

Editor's Note: Special thanks to our survey participants; we couldn't offer this coverage without you!

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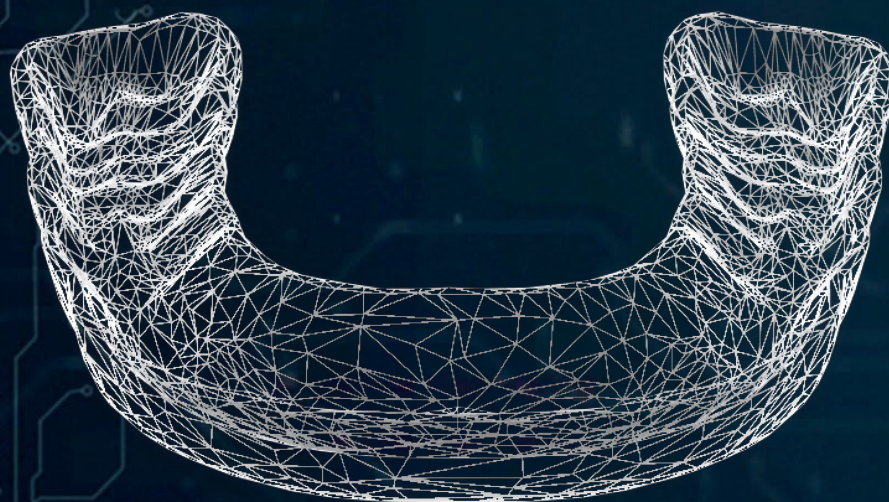
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Survey Demographics

LMT sent its *Removable Prosthetic Survey* to 3,000 lab owners, managers and department heads and had a 7.5% response. Eighty-two percent of our respondents are owners and 18% are managers and department heads. In terms of lab type, 63% of respondents are from denture/partial labs; 37% from full service. Sixty-five percent are one- to five-person operations and 35% employ more than six people; most of the larger labs are full service labs. Respondents come from a representative geographical cross section of the industry.

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LMT LAB DAY East 2022: Back in the New York Groove

It may have been chilly and rainy on October 1, but that didn't stop nearly 600 attendees from joining LMT at its 22nd LAB DAY East in its new venue at the Westchester Marriott in Tarrytown, NY.

The convenient East Coast location offered an intimate environment for shopping 88 exhibits and earning continuing education credits from 23 educational seminars

on a range of topics including 3D printing and implants.

"LAB DAY East was a great opportunity to see the latest in new technologies and to meet up with old friends. It was terrific seeing everyone!" said Joe Apap, Vice President, Dental Labs at Cayster Inc., New York, NY.

Thank you to all the attendees and exhibitors who made LAB DAY East's return to New York such a success!

Argen Expands Milling Services, Beta Tests Ti Bars

Argen's Milling Center now offers two new services:

- With ArgenMill Cobalt-Chrome, screw-retained bridges, crowns and bridges up to 14 units are milled from Argen CoCr 255 using a premium 5-axis milling process that requires little to no finishing; turnaround time is two days.
- ArgenZ HT+ and HT+ Multi-layer High Definition units are available for screw-retained and full-arch cases (up to 14 units). Milled with a 90° milling strategy for a high

degree of definition in the interproximal area, gingival features, and greater separation of teeth, the cases can be returned to the lab in green-state or fully sintered.

Also announced: Argen is beta-testing ArgenIS Titanium Bars, and planning to offer Hader, Dolder, Attachment, Wraparound and Montreal bars milled from Grade 23 titanium. For use in removable dentures at the abutment level, the lightweight bars will require little to no finishing and will be available for

both large and small implant sites. For more information, visit argen.com. ■



ArgenZ High Definition units



ArgenMill Cobalt-Chrome service includes crowns and bridges



ArgenIS Titanium Bars, currently being beta-tested

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Join us Next Year!

LMT LAB DAY East returns to Tarrytown, NY!

See you Sept. 23, 2023 at the Westchester Marriott.

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Human Zirconium Technology



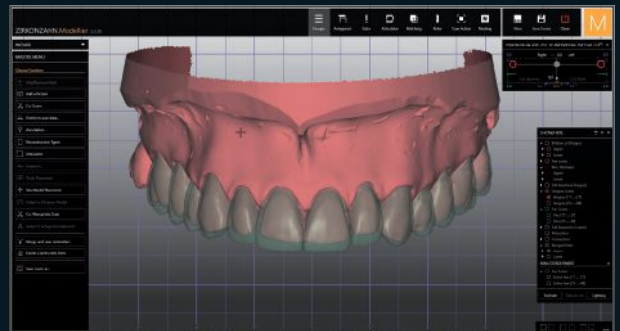
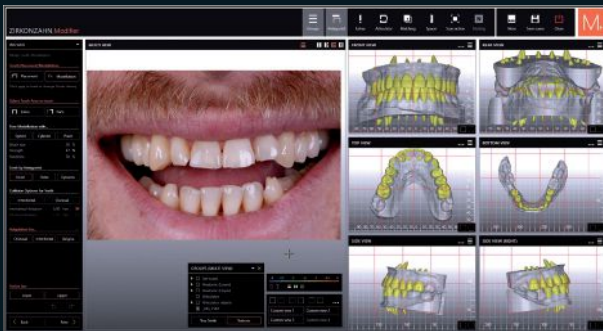
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 - *Virtual model articulation according to MDT Udo Plaster's approach (PlaneSystem®)*
 - *Tooth set-up in the Zirkonzahn.Modifier software and individualization of the tooth set AIDA from the virtual library Heroes Collection*
 - *Determination of the optimal insertion direction for realising a block-out model for the upper and lower mock-ups*
 - *Nesting of the mock-ups in a Temp Premium Flexible resin blank and milling; try-in in the patient's mouth*
 - *Digital adjustment of the first tooth set-up and creation of the preparation guides: communication tools used by the dental technician to suggest to the dentist which tooth areas have to be prepared for the minimally invasive treatment. In this way, the dental technician's functional and esthetic ideas can be included into the final result.*
 - *Minimally invasive tooth preparation*
 - *Design and milling of the ultra-thin veneers (0.2 mm), the partial crowns and the three-unit bridge using Prettau® 2 Dispersive® zirconia*
 - *Sintering and characterization with the ICE Stains 3D by Enrico Steger*
 - *Cementation of the final restorations in the patient's mouth*



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Dr. Francisco García Torres – Mexico

DT Alexander Lichtmannegger – Zirkonzahn Education Center Brunico, South Tyrol, Italy



NEW! PRETTAU® SKIN®

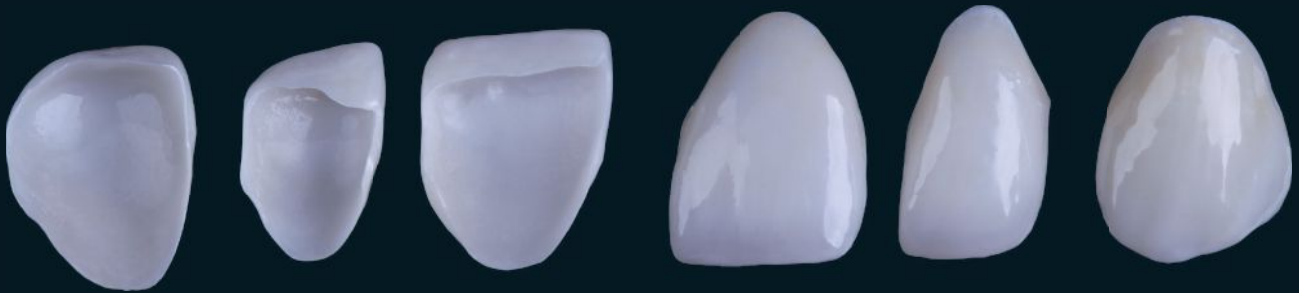
New technique for creating ultra-thin veneers with all typologies of Prettau® Dispersive® zirconia – Patients can get a healthy smile with zero to minimal impairment of tooth substance. The new technique is suitable for the esthetic correction of tooth discolorations, tooth gaps, crooked teeth, cone teeth and abraded teeth.





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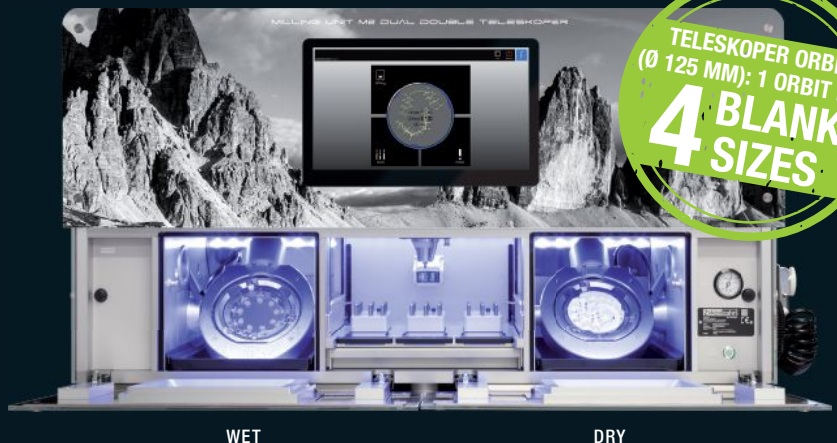
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WITH THE TELESKOPER ORBIT Ø 125 MM



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INFORMATION



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HeyGears Launches Latest 3D Printing Workhorse, Resin Station

HeyGears made a big splash with its new UltraCraft A3D Printer at LAB DAY East. “We designed the A3D based on feedback we received from our lab customers who needed a more efficient, more automated and easily scalable production solution,” said Mason Chen, Technical Engineer at HeyGears, during the product launch seminar where the company unveiled the machine.

Features include: twice the build volume of the UltraCraft A2D, allowing labs to print more parts in a single batch; integrated automatic printed part removal with a storage bin that holds up to 250 full-arch

models; and a 1- or 3-liter auto resin refill feature that refills the printing tray in two-and-half minutes, allowing the printer to operate unattended for over 16 hours depending on the dental application.

For labs looking for even more automation and higher production output, HeyGears also announced its new Resin Station option with a 24-liter resin storage capacity: the station can connect with and automatically refill up to four A3D printers using four 6-liter resin bottles (each bottle can contain a different resin type) for 24/7 continuous production. Visit heygears.com. ■



Up to four of HeyGears’ new UltraCraft A3D printers can be connected to its new Resin Station (center).

Lucky Lab Owner Snags Fire Pit in Garfield Refining’s LAB DAY Giveaway



Garfield Refining, a precious-metal refinery in Philadelphia, hosted a raffle for a Steel Drum Fire Pit valued at around \$375. The lucky attendee, Enrico Romano, CEO/Owner of Aurora Digital Technology Center, Wappingers Falls, NY, took home the prize and is pictured here with his wife Gina, Aurora’s CMO.

Aurident Raffles Off Amazon Gift Cards



LMT CEO Judy Fishman (far right) picks the winning names in Aurident’s LAB DAY East raffle. Chan Kwon, 1 Dental Ceramics, Newport News, VA, and Dorian Kerenxhi, Dorian Studios, Inc., New York, NY, were the lucky winners of \$50 Amazon gift cards. Looking on are Aurident’s team members (from l. to r.) Kim Murphy, Leonard Hoffman and Sungsoo Choi.

Attendee Wins Gaming Monitor in evident Drawing



Steve Fey (not pictured), Director of Sales at Maverick Dental Lab, Export, PA, was the lucky winner of a MSI Optix MAG342CQR 1500R Curve Gaming Monitor, valued at \$454, raffled off by evident Dental CAD Design Center. Pictured here with the prize are the company’s Noah Kalaw (left) and Derek Carroll.

Zahn Gives Attendees Look at its Digital Offerings



Omar Gonzalez and the Zahn team were thrilled with LAB DAY East’s new location in Tarrytown, NY. The company showcased its digital offerings, including Myerson, Flexcera and Keystone 3D print resins, and Asiga and Desktop Health printers.

Turn the page for more LAB DAY East coverage

Zirconia, Mills and More Launched at the Show

With 88 exhibitors on hand, there was plenty to see on the show floor. In addition to the products and services on the previous pages, here are 12 more that made their LAB DAY debut:

- Chengdu Besmile Bio-

technology Co., Ltd. showcased its Aconia SHT 3D Multilayer zirconia. Suitable for all indications, the material offers an even shrinkage rate, excellent esthetics, high strength and a seamless transition in translucency, strength and

shade, allowing a natural effect from dentin to enamel. The discs are available in 16 VITA classical shades and three bleach shades. Visit bsmdental.com or email info@cdbesmile.com.

- **Fricke Dental Mfg.** is now distributing idodontine CAD/CAM Solutions PMMA discs manufactured by Unidesa-odi. Made of Rr-HCL-PMMA acrylic resin, the discs are abrasion resistant, color stable, biocompatible, offer fluorescence similar to natural teeth and available in 98.5mm for standard CAD/CAM systems. Visit frickedental.com.

- **GPAINNOVA** launched its new cobalt-chrome and titanium crown and bridge fixation system for use with its DLYte electropolishing machines. The DLYte system provides high-quality polishing, replacing electrolytic baths, and hand polishing, allowing for higher productivity, reduced time and costs, and predictable and repeatable results. Visit dlyte.com.

- Inspired by feedback from laboratories that the blue die in its Panasil® Lab Putty Soft discolored hands and models, **Kettenbach** has released the material in a new yellow color for better handling. Ideal for use as an overcast and bite index material due to its high final hardness, the putty is also dimensionally stable. Sold direct, the putty is sold in a box that contains 5kg Base and 5kg Catalyst, and color-coded scoops for dispensing. Visit kettenbach-dental.us.

- **Nexa3D** showcased its new NXD 200Pro 3D printer for orthodontic models, surgical guides, splints, impression trays and nightguards. It has a patented structured light matrix and an 8.5-liter build volume measuring 10.8" x 6.1" x 7.8". The printer offers high speed, high throughput and is validated for Keystone resins. The Pro Series is fully compatible with Nexa3D's post-processing solutions, including xWash, xCure and xClean. Visit nexa3d.com.

- **Ransom & Randolph** launched Flex-Form resin patterns, a blend of plastic and wax made in a variety of shapes and 20-plus patterns that are ideal for retainers, spacers, braces and partial and complete dentures. In addition, the company's new Neoloy Plus CoCr alloy delivers

inclusion-free precision castings with adjustable spring hardness, a luster that's highly resistant to corrosion and is highly fracture resistant. It has a strong, passive protective oxide layer formulation to prevent corrosion damage to the final product. Visit ransomrandolph.com.

- The all-new DWX-53DC from **Roland DGA's DGSHAPE** made its debut at the show. A PMMA workhorse, the new milling solution features a redesigned spindle with increased gripping power and a 4-mm roughing tool for fast milling of PMMA materials. It also offers automated clean milling, real-time monitoring via a built-in web camera and an enhanced six-disc automatic changer for faster disc exchange. Visit rolanddga.com/dwx-53dc.

- **TCS Millable Discs** are now FDA-approved and available for purchase through Zahn Dental and Nowak Dental Supplies. The discs are available in Unbreakable and iFlex in standard pink, light pink, dark pink and natural. Visit tcsdentalinc.com.

- **VITA North America** added seven new shades to its VITA YZ ST Multicolor line-up: B1, C1, 1M1, 2M1, 3M1, 4M1 and special bleached shade 0M1. These polychromatic materials are suitable for producing monolithic and partially veneered frameworks and restorations in both anterior and posterior regions. Visit vitanorthamerica.com.

- **Whip Mix** introduced the VeriLUX Curing Unit for post curing a wide range of 3D print resins. It features a smart UV-light source management system for maximized energy efficiency, a pre-loaded validated curing time database for easy use as well as pre-loaded curing settings to eliminate entering the incorrect time or intensity for accuracy and consistency. Visit whipmix.com.

- **Zirkonzahn** highlighted its new user-friendly M2 Dual Double Teleskoper milling unit. It features two spacious, optimally illuminated and easily accessible milling chambers, both equipped with the Teleskoper Orbit (Ø125 mm), which allows for fully automatic, accurate and wet-dry milling. Visit zirkonzahn.com. ■

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Pac-Dent has validated Rodin Sculpture in workflows using these printers.



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Asiga® Pico 2
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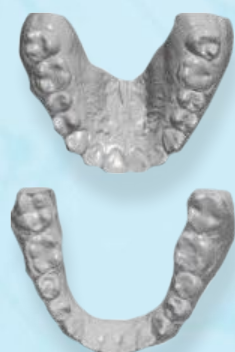


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Roland and vhf Mills

ARGEN offers a full line of Roland and vhf mills known for ease of use and complex milling ability. The company allows the mix and match of a preferred mill, suction unit, furnace and accessories to meet your specific needs. Access to Argen's professional tooling and milling strategies is included with the mills. **Contact Info:** 858-255-5524, customercare@argen.com, argen.com



PrograMill PM7 and CAM Software

Ivoclar's PrograMill PM7 is equipped with an integrated PC and touchscreen monitor and the modern design offers intuitive and easy operation. The PrograMill CAM software automatically recognizes the design parameters and allows the user to fully rely on the processing strategies developed for use with PrograMill tools, removing the need for human intervention. Labs benefit from value-added workflows, intuitive RFID technology and software and equipment that allow them to achieve high-quality restorations and impressive esthetics. **Contact Info:** vatsla.dubey@externals.ivoclar.com, ivoclar.com/en_us/products/digital-equipment/programill-pm7



P53 Milling Machine

Offered by AURIDENT, the P53 is a 5-axis machine for milling zirconia and PMMA. Easy to use with smart startup, the P53 has fully automatic calibration and smart initialization built in. The machine provides an intelligent control system with excellent integration. UPCAM CAM software is included at no charge and supports all types of restorations. **Contact Info:** 800-422-7373, sales@aurident.com, aurident.com



DWX-53DC Milling Machine

DAL DT TECHNOLOGIES is offering the new Roland DWX-53DC dry milling machine. The 5-axis mill features a 6-disc changer with fast exchange and a built-in fully integrated webcam for 24-hour remote monitoring, allowing you to automatically mill a full-range of quality restorations with unattended confidence. This state-of-the-art mill also includes a redesigned, more robust user-replaceable spindle as well as a dedicated extraction unit and connection cable, providing clean milling and reducing maintenance. **Contact Info:** 888-894-2148, dt@dentalartslab.com, daldttechnologies.com



M2 Dual Double Teleskoper

The M2 Dual Double Teleskoper by ZIRKONZAHN offers two separate milling chambers that enable sequential wet and dry processes without manual, in-between cleaning. Conceived as a stand-alone solution, the machine comes with an integrated PC with a touchscreen and separate, contamination-protected tool chamber with automatic tool changer function for up to 63 tool slots. With the extra-large Teleskoper Orbit equipped in both chambers, this milling unit processes soft and hard material blanks in diameters of 95, 98, 106 and 125mm. The optical tool detection ensures a secure milling bur selection. **Contact Info:** 800-989-8931, infousa@zirkonzahn.com, zirkonzahn.com



Alien R5

ALIEN MILLING TECHNOLOGIES' new highly automated milling and grinding machine features a 10-fold blank charger for wet and dry machining. The Alien R5 combines precision with maximum stability and is capable of handling any material. **Contact Info:** 844-947-2664, support@alienmilling.com, alienmilling.com



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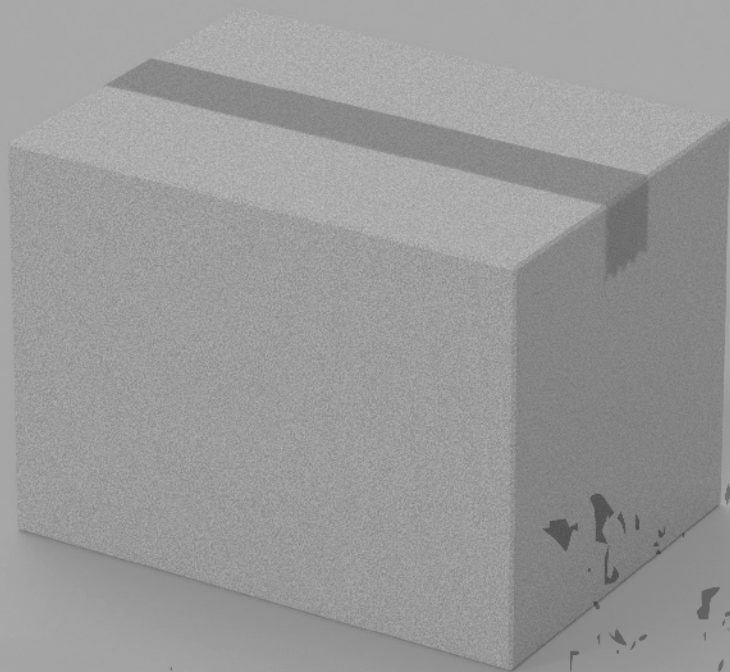


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DWX-53DC Mill

Roland DGSHAPE's DWX-53DC 5-axis dry milling machine offered by ZAHN DENTAL has new and improved features such as a redesigned spindle for more gripping power, a 4-mm tool for fast roughing of PMMA and acrylic, and a dedicated extraction unit and connection cable for a clean workspace and less maintenance. Features also include a built-in webcam for real-time monitoring and an automatic-disc changer for fast exchange. **Contact Info:** 800-496-9500, Zahn@henryschein.com, zahndental.com



Milling Machines

OPULENT DIGITAL SPECIALISTS offers Amann Girrbach mills including the Motion 2 wet/dry 5-axis unit and Motion 3 wet/dry milling unit that has remote capabilities, intuitive touch-screen interface and design; both mill everything from zirconia/ceramic restorations to All-On-X and denture cases. The company also offers the self-cleaning Matik Production Unit that has a 36-puck holder and 28-tool magazine; it's completely open to materials and mills everything from zirconia/ceramic restorations to All-On-X and denture cases including titanium pucks. All milling machines come with onsite installation/training and 24/7 technical support. **Contact Info:** 855-223-2261, info@opulentcadcam.com, opulentcadcam.com





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DGSHAPE DWX-53DC



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inLab MC X5

The 5-axis inLab MC X5 by DENTSPLY SIRONA offers milling and grinding and wet and dry processes and can be used with discs and blocks. Thanks to coordinated processes and thorough material validations, the unit offers high-quality results for a broad range of indications and flexible STL connection to existing CAD systems. The proprietary CAM software and the functional design of the inLab MC X5 are easy to use and offer productive manufacturing processes. **Contact Info:** 844-848-0137, dentsplysirona.com



Dental Softworks Software

Available from PRIMOTEC, Dental Softworks is a robust CAM software that can power most milling machines. The user-friendly interface makes learning the software simple and the software calculates jobs quickly. It's capable of milling all types of restorations including crowns, bridges, implants, bars, bite splints, dentures and more. **Contact Info:** 866-643-3129, 203-682-6429, info@primotecusa.com, primotecusa.com

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Roland Mills

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TRÜMILL X350 PRO+

As an integrated wet/dry mill, TRÜMILL X350 PRO+ from 3DBIO-CAD comes with high-resolution dynamic servo motors and absolute measuring systems. It's equipped with a water-cooled, powerful three-fold hybrid ball bearing and 2.6KW milling spindle. Stainless steel blank holders offer stability and reduce vibrations. Thermal expansion of the milling spindle is minimized, enabling precise milling results. **Contact Info:** 425-227-4333, info@3dbiocad.com, 3dbiocad.com



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P53DC Milling Machine

UP3D's 5-axis P53DC features an automatic disc changer for unattended, automatic milling and worry-free production. With 90° vertical milling, it offers easy anterior incisal embrasure milling. The automatic disc changer can accommodate 12 discs and multiple shades of zirconia, and replaces discs as instructed. It also features an automatic cleaning system that ensures a clean milling environment. **Contact Info:** Cecilia@up3d.cn, up3ds.com



Milling Machines

AMERICASMILES DENTAL LAB NETWORK is a nationwide reseller for imes-core, including all 5-axis machines, 150i Dry, 150i Pro, 350i Pro and Pro+; DOF's Craft 5X All-in-One mill; and Aidite's 4-axis wet mill and 5-axis dry mill. AmericaSmiles also distributes hyperDent CAM software for use with all open system machines. **Contact Info:** 708-746-5730, info@americasmiles.com, americasmiles.net



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XTCERA Milling Machines

XTCERA's new X-Mill 500 Plus is an updated version of the X-Mill 500 milling machine. It features a new design with an intelligent monitoring system and industrial-grade spindle, and offers 5-axis milling plus 90° facial milling that can maximize the material usage and automatic calibration. **Contact Info:** +86 15989372253, rose@xianton.com, en.xtcera.com/



vhf Milling Line

VHF mills combine innovative, time-optimizing features, like automated wet/dry milling conversion, multi-disc changers and tool-free disc loading with precision German engineering and manufacturing. vhf understands the challenges facing modern laboratories and manufactures its own mills, tools and CAM software to ensure your mills are running at 100% efficiency and produce high-quality restorations with optimized strategies for every material. **Contact Info:** 631-524-5252, sales.support.us@vhf.com, vhf.com



DGSHAPE DWX-53DC

From ROLAND DGA CORP., the new DWX-53DC 5-axis mill offers productivity, efficiency and convenience with features that benefit labs of any size. Boasting an automatic 6-disc changer with fast exchange and a 15-station automatic tool changer, the DWX-53DC offers uninterrupted 24-hour production. The redesigned, robust spindle offers excellent tool-gripping power for speed and predictability when milling PMMA applications. Also new: the 4-mm tool for fast roughing of PMMA. The DWX-53DC's built-in web camera, combined with its proprietary VPanel and DGSHAPE Cloud software, provides on-site and remote monitoring. **Contact Info:** 949-727-2100, mmalkin@rolanddga.com, rolanddga.com/products/dental



CAD/CAM Packages

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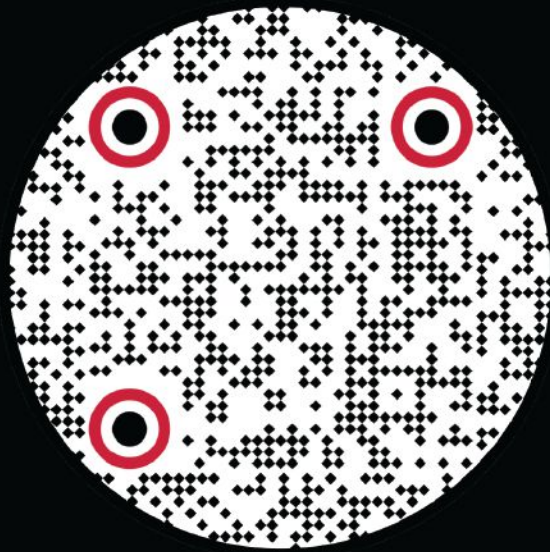
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Sebastien Mioranza Takes Coveted Top Spot in Panthera's Fifth Master Cup Competition

After a hiatus last year due to the pandemic, the Panthera Master Cup Competition—which challenges dental technicians, denturists and dentists to fabricate a complete denture case with implant bars—was back with a bang in 2022. Here, we profile the grand prize-winning case as well as the second- and third-place entries. **By Kim Molinaro, Managing Editor**

At a festive September ceremony complete with confetti and champagne at Panthera's headquarters in Quebec, the company announced the grand prize winner of its 2022 Master Cup Competition: Sebastien Mioranza, a technician with 23 years' of international experience. Trained in France, he has worked in laboratories in St. Maarten, Russia and Germany and is now a technician at Isabella Laboratory in Lausanne, Switzerland.

Mioranza triumphed over nine other finalists in this year's challenge: to fabricate a complex complete denture case including a double structure milled bar incorporating MK1 and CM Loc attachments on the upper and a fixed wraparound bar for the lower; all participants were given complete instructions and

the materials needed to complete the case. A panel of judges—including Dr. Miles Reed Cone, Dr. Michael Tholey, Ioulianos Moustakis, Jeffrey Dugre and Bernard Guggisberg—blindly evaluated the submissions based on the technicians' knowledge and skills, and the function and esthetics of the dentures.

For Mioranza, understanding and visualizing the patient was crucial to the success of his case. However, since the patient was only identified as a 64-year-old female, Mioranza enlisted the help of his wife, Laurence, to help bring her to life. "To obtain natural integration in the mouth, it's absolutely necessary to visualize the patient according to her age, morphology, ethnicity, skin color and more," he says. "I took photos of my wife, then used a simple phone app, Face-

App, to make her appear older. I then made a wax duplicate of the occlusal template, adapted it to her jaw and then merged her photos with the scan of my working models." (See photo below.)

All participants used VITAPAN® EXCELL and VITAPAN LINGOFORM teeth in the shape and shade of their choice. Mioranza chose VITAPAN

Continues



Right: Sebastien Mioranza shows off his winning case and his 2022 Master Cup championship ring at Panthera's Quebec headquarters in September. Above, left: To better visualize the patient, Mioranza took photos of his wife, aged them to make her appear older and then merged her photos with the scan of his working models.

2022 Master Cup Competition: Over \$70,000 CAD in Prizes

The top three winners of the 2022 Panthera Master Cup share more than \$70,000 CAD in prizes offered by Panthera Dental and its competition partners, VITA, Amann Girrbach, Cendres+Métaux and LMT. All three attendees received a trip to Panthera's Quebec headquarters, CM Soprano Surface Kit from Cendres+Métaux, VITA EASYSHADE® V digital spectrophotometer, special edition Golden Artex® CR from Amann Girrbach, a 2022 Master Cup championship ring 3D printed in titanium by Panthera and a feature article in LMT. In addition:

- First-place winner Sebastien Mioranza of Switzerland receives a VITA SMART. FIRE® furnace, 50-g gold bar, 2022 Master Cup championship ring custom milled by Panthera, and a trip to Bad Saeckingen, Germany, to visit VITA headquarters.

- Second-place winner Vlad Atanasoaie of the U.K. receives €2000 for VITA products and a 30-g gold bar.

- Third-place winner Christian von Bukowski receives €1000 for VITA products and a 20-g gold bar.






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Second Place



Vlad Atanasoaie's lifelike denture case features distinctive characterization.

Third Place



This case from Christian von Bukowski, a technician from Munich, Germany, placed third.

Continued

T48 for the upper and L37 for the lower in shade 2M2, then cut back the teeth so he could add characterization. "I wanted to obtain an aged look but, to preserve a luminous shade, I worked the internal areas with various shades of VITAVM[®]LC Flow composite, finished the tooth shape with clear and neutral shades, and used GC Optiglaze[™] Color for surface staining in the occlusal grooves," says Mioranza.

For the gingiva, he used Candolor X Plex pink resin in various shades and then reworked the texture and color transitions with various shades of VITAVMLC Flow Gingiva composite.

"I entered the competition because I like solving complex problems and I'm proud of my final result," says Mioranza, who provided his required case documentation as a detailed, photo book in both English and French, his native language. "To be selected from among the 10 finalists is a great honor; they are all 'Super' technicians."

Second Place: Vlad Atanasoaie, Oxford, England

As soon as Vlad Atanasoaie opened the initial box of materials from Panthera, he knew he was in for a challenge. "I saw the

bars and locators and definitely felt out of my comfort zone; the case was complex but exciting," says Atanasoaie, a technician at Byrnes Dental Lab in Oxford, England.

To characterize the denture teeth—he selected an ovoid shape in shades 2M2-2M1—he trimmed them all around to create a natural look then rebuilt them using TWiNY indirect composite resin from Yamakin. For the gingiva, he trimmed back as much as possible from the acrylic then layered using TWiNY. "I also added some effects using GC Gradia[®] and VITA gum stains and a final layer of anaxgum composite from anaxdent because it's quite translucent after light curing and the effects underneath are still visible," he says.

Third Place: Christian von Bukowski, Munich, Germany

Motivated by his friend Ioulianos Moustakis who won the Panthera Master Cup competition in 2020, Christian von Bukowski—a veteran technician who works at his family's laboratory, von Bukowski Dental Lab, in Munich, Germany—entered this year's contest to compare his skills on an international level.

To fabricate his case, he selected teeth in shade A2, with the canines one shade darker, and customized the position of the anterior teeth by slightly turning out teeth #12 and 22. He used a minimal cut-back technique on the maxillary anterior teeth, used GC Gradia Plus to layer and stain internally. For the gingiva, he used pink PMMA (Xthetic[®] prime from AcrylX) then individually layered the gingiva with GC Gradia Plus Gum using shades GBH1, GBH2 and GBH3.

"I competed against first-class technicians," says von Bukowski. "They all fabricated great cases and I'm proud to have finished in the top three." **LMT**

Editor's Note: To learn more about the 2023 Master Cup competition and to sign up to be notified when registration opens, visit pantheradental.com/master-cup.

Coverage continues

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A Decade of Growth: Panthera Dental Celebrates 10-Year Anniversary

By Kim Molinaro, Managing Editor

In September, Panthera Dental celebrated 10 years in business in style: 350 people from seven countries were treated to a spectacular party at its headquarters in Quebec, complete with tours of the state-of-the-art facility; ice sculptures; appetizers and cocktails; unique acrobatic performances; and the reveal of its 2022 Master Cup competition winners (*see related coverage on page 26*).

The company has much to

commemorate. Since siblings Gabriel and Beatrice Robichaud founded Panthera a decade ago with just seven employees, it has grown to a staff of 125 with 5,000 customers across 35 countries and three distinct divisions:

- **Panthera Prosthetic** fabricates bars, implant bridges, custom abutments and more.
- **Panthera Sleep** prints devices for snoring, obstructive sleep apnea and bruxism.
- **Panthera Implant** offers

a range of implant and cranio-maxillofacial products as well as anaplastology solutions.

Key to Panthera's success is its constant drive to innovate. For instance, since 2012, the company and its mechanical R&D team has developed more than 60 patented products and industrial designs including mandibular protrusion devices, dental superstructures, and attachment systems for removable dental prostheses and subperiosteal implants. In addi-

tion, its four software development teams have developed six proprietary software systems for internal use, including 3D design software and a workflow tracking system.

"Creating our own software gives us a big advantage," says Beatrice, Co-Founder and VP of Marketing and Customer Experience. "It allows us to design and develop new solutions that are not available in off-the-shelf software packages and gives us the freedom to change and adjust



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Top: The two-story production department houses dozens of printers and milling machines—some of which weigh 10 tons. The floor is made of 12" thick concrete—three times thicker than the average floor—to accommodate their weight and absorb the vibrations of nearby traffic. Above left: A traveling robot affectionately named "Alfred" boosts efficiency by moving from department to department to deliver cases. Above right: Beatrice Robichaud, Co-Founder and VP of Marketing and Customer Experience, holds a sample of restorations that can be printed with the company's newest titanium 3D printer.

the software according to our needs.”

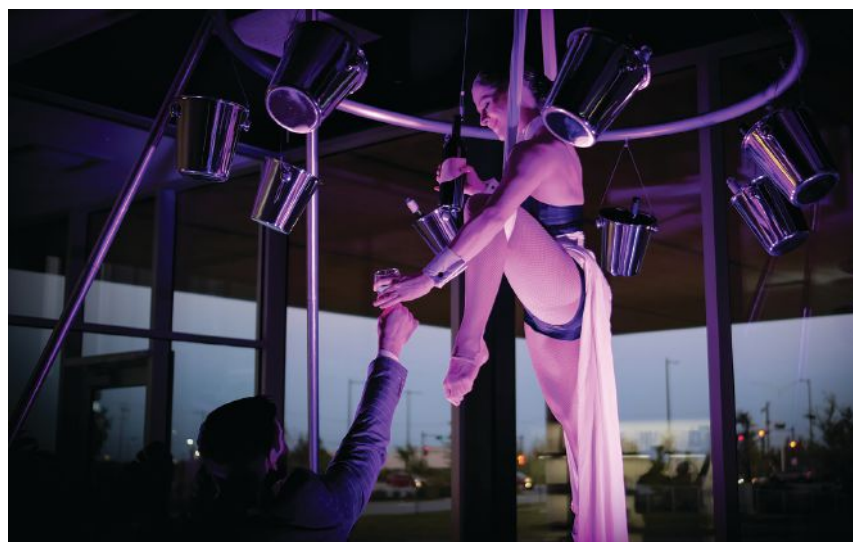
One of the company’s latest achievements in the sleep market: Panthera’s D-SAD Classic sleep appliance—developed in 2012—is now eligible for Medicare reimbursement under the E0486 HCPCS. Until now, only two types of sleep appliances—TAB and Herbst devices—have been eligible according to PDAC (Pricing, Data Analysis and Coding), the contractor responsible for Medicare coding.

“Compared to the devices that have been on the market for 30-plus years, our new generation appliance is 3D printed from biocompatible polymer and is advantageous for patients due to its smaller size and durability,” says Beatrice. “Medicare reimbursement is a big milestone because it puts us in the ideal position to offer an alternative device in this huge market.”

State-of-the-Art 4.0 Manufacturing Facility

The event also gave Panthera the chance to showcase its 40,000-square-foot Industrial and Digital Manufacturing center completed in 2019. Designed by Panthera CEO Gabriel Robichaud, the contemporary facility offers room for up to 250 employees and features floor-to-ceiling windows, several unique meeting spaces and hangout rooms, soundproof pods for private meetings, outdoor terraces and even a video game room.

The focal point of the building is its open, two-story, approximately 26,000-square-foot production center created following Industry 4.0 or “smart factory” principles that automate processes and data exchange. For instance, since each machine in the center has its own robot that can select and restock materials, change tools if needed and



At Panthera’s 10-year anniversary celebration, an aerial silks performer pours an attendee a glass of wine while dangling in mid-air.

run diagnostics, the department can run autonomously for three to four days at a time with just one employee supervising the process.

The center’s latest acquisition is a new-generation titanium 3D printer and the Robichauds are excited about its capabilities for

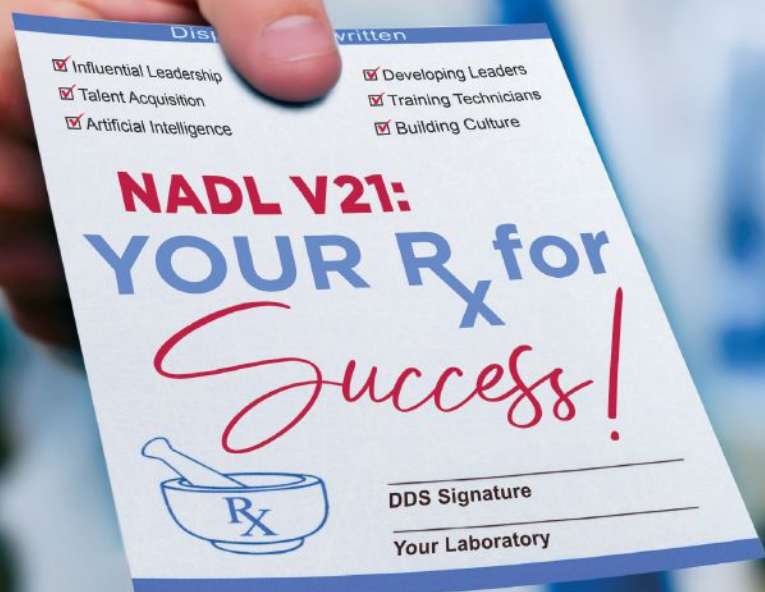
its customers. Says Beatrice, “This new unit has its own internal system to recycle the titanium powder, reducing the loss of raw material, and uses new algorithms and lasers that allow fewer supports and therefore more complex geometries to be printed.” **LMT**



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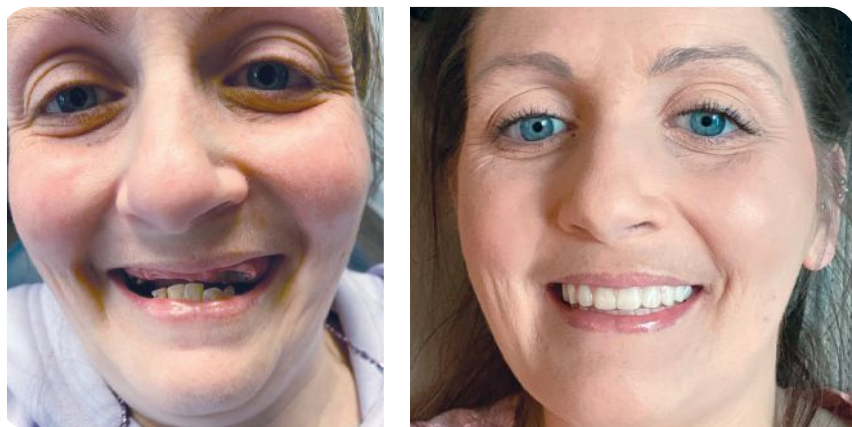
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Readers' Favorite Cases of the Year

Full Mouth Reconstruction Restores Young Mom's Confidence



Prescription drug abuse, addiction and neglect led this young mother to lose most of her upper and lower teeth. We restored both arches with an All-on-X treatment plan: four implants on the maxilla and five implants on the mandible.



We used the Medit 500 scanner, exocad software, PIC photogrammetry system and Einstein printer to digitally capture, design and deliver the patient's new smile the same day. The bridges were printed in less than 30 minutes with Flexcera Smile ultra+ and pink composites were added for a more natural look. The final result restored not only the patient's smile, but the youth and confidence she had lost, making this one of my most rewarding cases.

~ Dora Rodrigues, President, ID Dental, Kenilworth, NJ

Technicians Eliminate Patient's TMJ Pain with C2O Appliance and Partial Denture

This unique case was for a patient experiencing extreme TMJ issues; these patients experience such pain that they're often at their wit's end and, sadly, some even consider suicide after failed efforts to treat it.

My friend, Curt Morgese, CDT, Owner of Oral Renaissance Dental Lab, Indian Lake, PA and I worked on this case together. It started with a CBCT scan in order to fabricate a Condylar Centering Orthotic (C2O) appliance to reset the condyles and establish a new vertical dimension to achieve centric occlusion and centric relation and eliminate pain. After a few months, another CBCT scan was done to verify that the condyles were seated properly.

We then waxed up the case using the new vertical dimension and perfect occlusion and contact points as nature intended. Although there are several options for a final restoration using this technique—anywhere from resin bonding or composite material to ceramic C&B—I cast and finished a partial denture framework to maintain that new occlusal plane and keep the mandible seated in the correct position. The patient is now pain-free and happy with the results.

~ Nick Hayden, RG, Owner, Partial Foundations Dental Lab, New Stanton, PA



Six Implants Plus One Technician Equals 10 Years Younger



This upper-arch reconstruction patient came in with severe decay and mobility on his upper anterior teeth and was edentulous in the posterior. The treatment plan was for six implants; after the CBCT scan, I fabricated a surgical guide using RealGuide software as well as a temporary removable denture.

After the patient healed for about three months and implants were well integrated, we scanned the denture and took digital records using a scan body in order to 3D print a same-day PMMA prototype (using BEGO VarseoSmile Temp resin in shade B1) for him to wear temporarily. A few months later, I used the same records to fabricate a PEEK hybrid and full contour zirconia restoration for the posterior teeth and a layered zirconia on the anterior (Argen HT, also in B1). The patient walked out looking 10 years younger!

~ Paul Lubrano, MDT, Owner, Bespoke Dental Technologies, Milford, CT

Dog in the Dental Chair: Shepherd Gets Gold Crowns



I have more than 45 years' experience in the industry and have been collaborating with veterinary dental specialists for the last decade. Most of the animal restorations we do involve only one or two teeth, usually a canine or a carnassial tooth; carnassial teeth are the upper fourth premolar and the lower first molar and designed to shear flesh and bone.

This case involved replacing all four canines for this 10-year-old German Shepherd who fractured them on a metal cage; the interdigation factor made it more complex. The veterinary dentist's treatment plan began with a professional dental cleaning, root canal treatment and crown preparations. He sent a detailed impression and I fabricated four cast gold restorations.

~ Richard Masters, CDT, Owner, Masters Dental Lab, Williamsport, PA

Cuspid-to-Cuspid Restorations Remedy Overbite, Lisp



The patient was extremely unhappy with her smile. She had an 11-mm overbite and couldn't put her lips together; she also had a lisp due to the spaces between her teeth. I made a diagnostic waxup and, following her approval, used it to make the provisionals. For the final cuspid-to-cuspid restorations—three single units and a three-unit bridge—I pressed and layered e.max and then added e.max pink porcelain on the gingival and interproximal to fill in the gaps. The patient was extremely delighted with the end result.

~ Andy Martinez, Lead Ceramist, Andre's Dental Studio Inc., Houston, TX

Have your own favorite case to share? Email maribeth@LMTmag.com

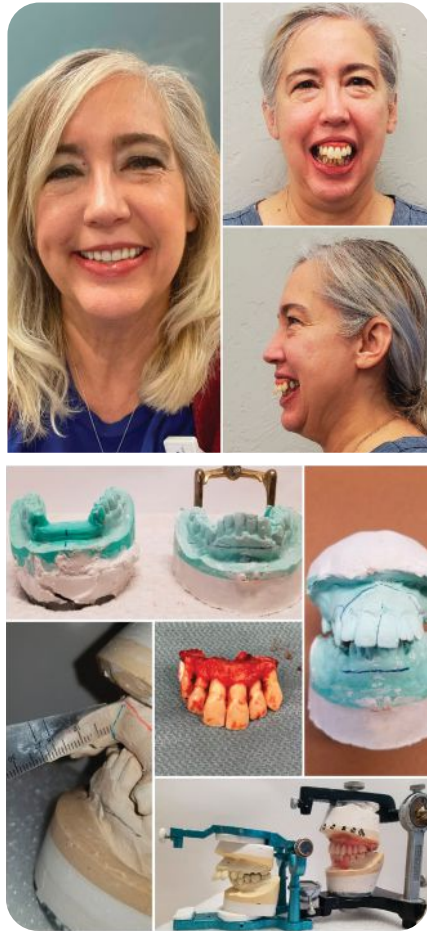
Communication Key to Life-Changing Transformation

This patient could not use a spoon or even lick her lips; there is no medical diagnosis but her grandmother had this same condition. She went to several doctors and dentists but never felt comfortable with the treatment plan until she met Dr. Robert Simpson. The patient had a 22-mm alveoplasty and Dr. Simpson sent a prepped model for a clear surgical stent.

We made a treatment denture with 8-mm incisors and it showed a little too much acrylic. After she healed for two months, we made a new maxillary denture with 11.5-mm incisors and did a try-in to achieve ideal esthetics. The patient had originally said, "I just want to look ok" but now she looks and feels fantastic.

This is my biggest case of 32 years and communication with Dr. Simpson and his assistant, Crystal Taylor-Holley, was crucial. I also want to thank my mentors with whom I consulted about this case: David Dembinski and Sharon Bernard.

~ Trina Longman, Owner
Dental Plus Laboratory, Newalla, OK



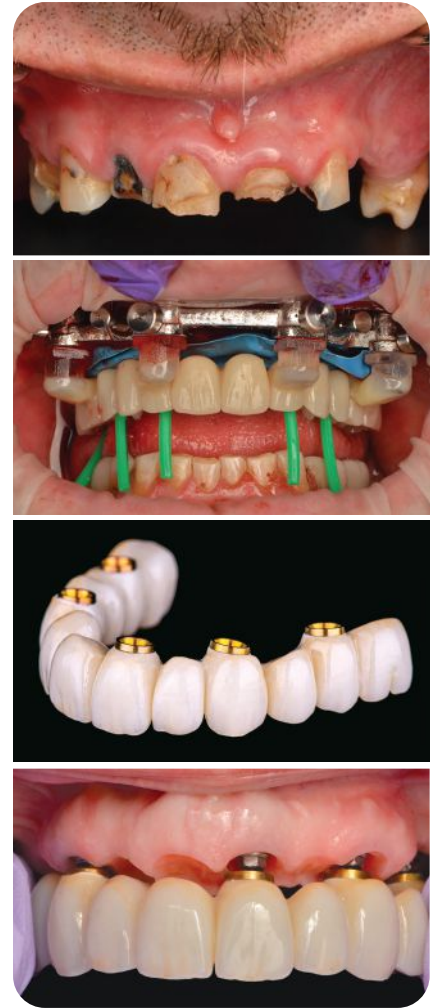
Dental Team Overcomes Hygiene Challenge

Over the last two decades, the popularity of All-on-X cases has grown exponentially, but hygiene concerns remain. In this challenging case, processed with Dr. Mark Ludlow, Utah University, the patient presented with severely failed dentition. Although major tooth structure was lost, the VDO did not collapse.

The bite couldn't be opened to create restorative space and hygiene was an issue, so we had to remove bone. Using the NavaGation Synergy Solution, we digitally planned the case, including an FPI restoration and a scalloped bone reference plane to enable the clinician to accurately contour the bone.

After healing, the Absolute ART Team delivered a perfectly convex monolithic zirconia hybrid full-arch prosthesis.

~ Conrad Rensburg, President
Jack Marrano, CDT, Director
of Signature Prosthetics Division
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Dental Team Restores Patient's Smile—and Trust



This has been my toughest case of the year, not because it's a full mouth reconstruction or involves implants, but because of the patient. She had been to numerous dentists who butchered her teeth and gums, over prepping teeth and blocking out two root canal teeth. She was left in a temporary restoration for years and had lost teeth, bone and trust.

The previous restorations were bulky and she wanted a softer, more feminine look with more dominant centrals. We had weekly meetings to keep her involved and let her know she was being heard, from initial consult through surgery to place implants, to try-in and finalization.

I designed custom hybrid abutments for the implants and used Ivoclar e.max HTBL3 with a minimal cutback. For the root canal teeth, I used a double-press technique with LTBL3 for the first layer and HTBL3 for the outer layer. She is very happy with the outcome and even happier she can trust a dental team.

~ Martin Martinez, Ceramist, Beverly Hills, CA

Technician-Son Gives Mom New Lease on Life



When my mother was about 17, she had an accident in a pool and broke all of her anterior teeth and then, by age 30, had lost her upper posteriors. She is now 62 and, after wearing dentures for more than 30 years, her options were limited. We had consults in the past but never trusted the treatment proposed until I started a new role at Nuvia Implant Centers and met Dr. Preston Hansen, an oral surgeon, and his team. Due to bone loss, he recommended zirconia hybrid bridges over zygomatic implants. He placed four implants on the upper and four on the lower and I fabricated two zirconia bridges. She is very happy now, loves the way she looks, and is more active and social.

~ Jose Echeverry, Lab Director, Nuvia Dental Implant Center, Salt Lake City, UT

Out-of-the-Box Solution to Damaged Implant Avoids Second Surgery

The most unique case we had recently was one where the screw had broken in an implant and multiple attempts to retrieve it weren't successful. Rather than core out the existing implant and start over, Dr. Vin Bhasin asked if we could do an old-school post and core.

We received a perfect impression and I made a metal post with a band following the tissue contour and fired opaque and margin porcelain over it to mimic the shape of a conventional preparation. Since the patient had existing PFM crowns, I fabricated a PFM crown using Ceramco 3 porcelain to go over the post.

I did have to dust off the cobwebs on some skills I haven't used in a while, but we were able to provide the patient with a unique solution that avoided another surgery and several months of healing; everyone was happy with the outcome. The beauty of the process was working with a practitioner who was willing to think outside the box and go through the proper steps to get a perfect impression.

~ Gregory Davis, CDT, President
Artistic Restorations Dental Lab, Warner Robins, GA

Heirloom Diamond Adds Sparkle to New Smile

This patient presented with an implant placed in the #6 and #4 positions and was missing tooth #7. Tooth #4 was restored with a cement-retained e.max crown over a custom titanium abutment. However, for #6, the patient had an unusual request: he had an heirloom diamond that had belonged to a relative and wanted it embedded into the restoration.

We fabricated a custom titanium abutment with an angled screw channel for the #6 implant; we then designed and fabricated a cantilevered e.max bridge and sent it off for shade verification, fit and function check, and approval of diamond placement. No major adjustments were needed, so we proceeded to complete the bridge. We applied metal primer and GC America's light-cure opaque to help mask the titanium stump, cemented the bridge to the abutment and carefully bonded the diamond to the facial surface of #6. Patient has since been in for a checkup and loves his restorations! Collaboration with John Alan Smith, DDS, Kingsport, TN.

~ Thomas O'Neil, President, Harmony Dental Creations, Elizabethton, TN



Dark Teeth, Limited Space Present Esthetic Challenge for Two Anterior Cases



Both of these cases were challenging for similar reasons: both patients presented with very dark teeth and limited space and wanted bright smiles with minimal reduction.

Case 1 replaced teeth #4 through #13 and Case 2 replaced teeth #6 through #11. Based on the prep designs, space available, material strength and desired outcomes, I chose pressable ceramics for both. I used opaceous e.max LT ingots to mask the dark stump and provide the ideal background for the veneers. I then microlayered two different incisal powders with some neutral and translucent shades to create a translucent, polychromatic look and also used 3D stains to enhance vitality and better match the color of the surrounding teeth. Both patients were happy with the end result and that's what keeps me making teeth!

~ Massoudah Faiz, Owner, Faiz Dental Studio, Lawrenceville, GA



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For a limited time, Aurident is offering 20% off Asiga and Shining 3D printing resins.

Asiga Denta resins cover a range of applications including models, trays, surgical guides, denture bases and teeth, indirect bonding trays, gingiva masks, partial frameworks and C&B to be pressed or cast. Shining Dent resins from Shining 3D are for printing dental models, ortho models, surgical guides, castable wax and gingiva masks.

To complement the line of resins and give laboratories and dentists a variety of printers with different price points, Aurident also offers Asiga desktop Max UV and ProK printers



and the Shining 3D L4D printer. For more information on 3D resins and printers from Aurident, call 800-422-7373 or visit aurident.co/3dresin.

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DentalCAD 3.1 Rijeka

EXOCAD, an Align Technology, Inc. company, released the next generation of its software, DentalCAD 3.1 Rijeka. It offers more than 45 new and over 85 enhanced features, all designed to optimize workflows and increase productivity. For example, the Smile Creator add-on module offers more visualization options, such as improved color adjustment for more realistic preview images, and a new slider-based before-and-after view. In addition, users can reuse custom tooth setups for multiple indications along the patient case journey and the functionality of Instant Anatomic Morphing has been expanded. For more information, visit exocad.com/our-products/dentalcad-rijeka.



Dental System 2022

3SHAPE's latest version of its CAD software, Dental System 2022, makes workflows faster and more predictable. Some of the new features include virtual preparation for more control over restorative design workflow, web case 3D preview for easier review of treatment proposals, new sculpt tools and models for articulator and denture-on-implant functions. For more information, visit 3shape.com/en/software-updates/dental-system.

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FREEPRINT® CROWN

The new FREEPRINT CROWN from DETAX is a biocompatible resin for permanent single crowns, denture teeth and long-term temporary bridges. It comes in eight esthetic shades and offers quick post-processing time. It's part of the FREEPRINT line which includes more than 30 high-performance 3D resins



for all dental applications. They are validated for more than 35 qualified printers/curing devices and have an extended shelf life of 36 months. Most of the line, including FREEPRINT CROWN, TEMP and DENTURE, have received U.S. FDA clearance. Visit detax.com for the latest list of validated printers and more information.

Phoenix-N

STRATEGY MILLING's new milling service features Phoenix-N, a palladium-based, silver-color, noble type IV ceramic alloy. Upon receiving the milled restoration, the technician just needs to sandblast it, remove pinning remnants and prepare the surface for the heat-treatment cycle. Milled PFM substructures minimize labor and alloy inventory and virtually eliminate cutting, soldering and welding while offering accurate fit, consistency and quality. Visit strategygoldmilling.com for a complete list of indications and more details.



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3D Printing: At the Beginning of the Journey, Endless Possibilities

By Lee Culp, CDT

Throughout the years, restorative trends and techniques have come and gone. Some developments have transformed the face of restorative dentistry, while other concepts have faded away. Digital dentistry and 3D printing is one concept that started out small and has increased in momentum until its potential now appears to be endless.

The early generations of full contour lithium disilicate and zirconia restorations were often received negatively due to the lack of esthetics at the time but, as raw material and ceramic technology companies worked together, the materials evolved in strength and esthetics to become the dominant restorative materials in dentistry today. Likewise, this first evolution of 3D-printed ceramic restorations should be regarded in a similar way: they will continue to evolve and expand in indications and offer dentistry many additional options in patient care.

The ADA's amendment of the definition of Porcelain/Ceramic for 2023 is an exciting development in the 3D printing arena. The amendment deletes "pressed, fired, polished or milled" from the definition, allowing for potential insurance coverage of 3D-printed nano-ceramic restorations.*

Another advancement in the 3D printing market are nano-ceramic-reinforced hybrid materials such as Rodin™ Sculpture from Pac-Dent, Inc. Indicated for single crowns, inlays, onlay and veneers, it has been FDA 510(k)-cleared as a Class II medical device and fulfills all regulatory requirements for use in both permanent and temporary restorations.

Our laboratory specializes in implant surgical and restorative design and we have been using Rodin Sculpture for 14 months for all of our temporary restorations, both tooth- and implant-supported; we've had no failures on long-term tooth-supported temporary restorations and minimal complications with implant-supported temporary restorations. The material offers excellent mechanical characteristics and esthetic properties, allowing us to produce lifelike permanent restorations on par with those made with traditional material, while streamlining the production process and reducing manufacturing costs. Its high concentration of ceramic fillers ensures maximal fracture resistance and minimizes repair visits.

We now 3D print 100% of our temporary restorations and have begun clinical trials on definitive restorations. See photos at right for a few examples of restorations printed with the material.



Definitive nano-ceramic bridge.



Implant-supported restoration.



Implant bridge after seating.

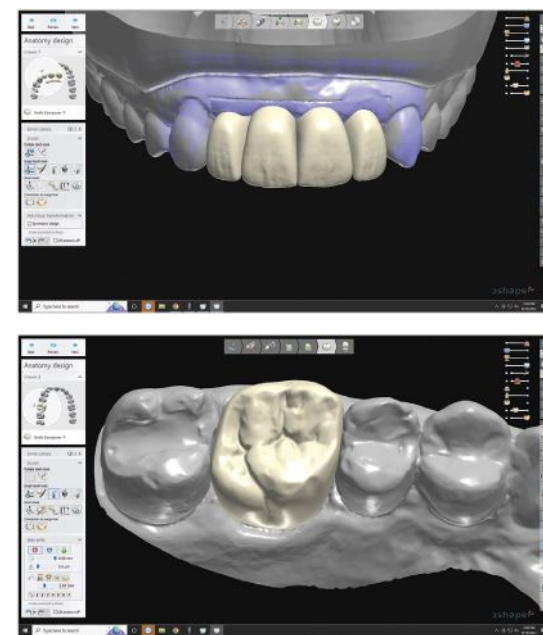


Jaw in a Day (JIAD): maxio-facial jaw replacement.

Fabrication Process

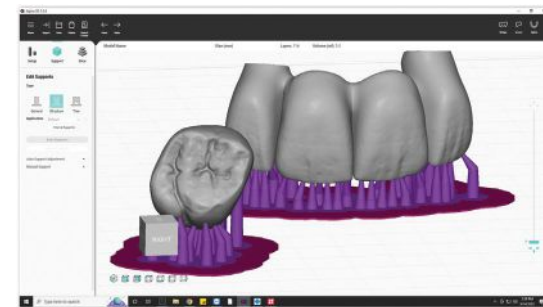
Here's a look at the design, printing process and final finishing using Rodin Sculpture system from Pac-Dent, Inc.:

Step 1



These screenshots show the final design for an implant bridge and single molar restoration. The success of any digitally created restoration begins with an excellent CAD design, taking into consideration the strength of the restoration, esthetics and contours for function and cleanability for implant restorations.

Step 2



The design is uploaded to printer software for print support creation.

* Specifically, the 2023 definition of Porcelain/Ceramic is "Refers to materials containing predominantly inorganic refractory compounds including porcelains, glasses, ceramics, and glass-ceramics." The 2022 definition reads, "Refers to pressed, fired, polished, or milled materials containing predominantly inorganic refractory compounds including porcelains, glasses, ceramics, and glass-ceramics."

Step 3



The completed data file is sent to the Ackuretta SOL 3D Printer and Rodin Sculpture resin is selected.

Step 4



The printed restorations are cleaned with a mild "scrubbing" with 96% alcohol and a soft toothbrush, dried and air abraded with low-pressure aluminum oxide.

Step 5




Restorations are then verified for fit and function and contoured for final esthetics with diamond burs.

Step 6



The Rodin Sculpture system includes specially designed stains and glazes with a chemistry that matches the print resin. The stain is applied and quickly light cured. The glaze is then applied and cured in an OtoFlash unit, a high-intensity light chamber with a nitrogen atmosphere, resulting in the glaze and restoration being fully cured together to ensure long-term adhesion of the two layers. Rodin Sculpture can also be easily polished to a high luster with conventional polishing techniques and polishing compound as in the fabrication of a denture.

For more information, call 909-839-0888 or visit pac-dent.com. 



Lee Culp, CDT, is the CEO of Sculpture Studios, a dental laboratory, research and product development center for new and innovative digital diagnostic, restorative and digital applied applications to surgical and restorative dentistry. He is an avid writer and has contributed to eight dental textbooks, including a chapter in Dr. Peter Dawson's book, *Functional Occlusion: From TMJ to Smile Design*. He is a leading resource/inventor for many of the materials, products and techniques used in dentistry today and holds numerous patents. His writing, photography and teaching style have brought him international recognition in the specialties of digital dentistry, dental ceramics and functional esthetics. He is the recipient of numerous awards from the American Society of Prosthodontics, American Academy of Cosmetic Dentistry, Dawson Academy and the NADL.

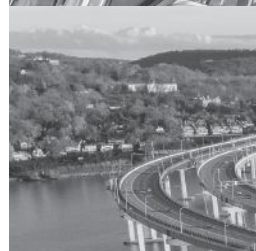
Author's Note: Although long-term data is not yet available, additive manufacturing appears to have great potential in fabricating permanent indirect restorations. The approach I describe represents a workflow and materials to manufacture individual high-end 3D-printed nano-ceramic hybrid restorations. It must be considered that the findings are based on my subjective experiences, as evidence-based literature on this material is limited at this time. At this time, my laboratory is involved in several University-based studies to validate this new material's wear, strength, and other factors important to long-term restorative success.

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Access Dental Laboratories, Syracuse, NY

Technician Realizes Longtime Dream of Lab Ownership

By Kim Molinaro, Managing Editor

In 2020, Todd Reid took the leap he had long been dreaming about: he left his job as a ceramist to open his own laboratory. He had meticulously prepared, creating a 40-page business plan, finding a building to purchase, securing a line of credit and hiring a grant writer who eventually helped him land two economic development grants totaling \$700,000.

However, his careful planning hit a snag when the purchase

of the building fell through and then the pandemic hit, delaying his timeline. At the end of 2021, Reid found an ideal location: a 3,600-square-foot building on the campus of the Syracuse Community Health Center in Syracuse, NY, with a dental office on the first floor. It has plenty of room for growth, an important feature because one of the grants requires him to hire and train about 40 people from the local community over the next seven years.

But first, the space needed a complete renovation, including tearing down and building walls to create a better workflow as well as new plumbing and electrical work. Reid worked with an architect to design the space and Handler and Benco to determine the layout and purchase equipment.

Access Dental Laboratories officially opened in January and is in full marketing and hiring mode, having already hired 20 employees, mostly based on

employee referrals. Four of the lab's employees are also family members; Reid's wife, Dr. Shanelle Benson Reid, serves as Chief Administrative Officer and three of the couple's children also work in the laboratory: Maurice in CAD/CAM, Todd Jr. in finishing and Alexa in shipping and receiving. "I'm proud I'm building something for my children to carry on," says Reid.

Below is a look inside the growing full-service operation. ■



The reception area features a sleek, curved desk and the gray luxury vinyl tiles used throughout the facility. Double glass doors are installed throughout the lab; here, they lead into the heart of the lab's production areas.



Todd Reid (center) and his family at the ribbon-cutting ceremony in January.



The CAD/CAM department is equipped with a Medit scanner and exocad design software, two Amann Girrbach Ceramill Motion 2 mills, two sintering ovens and its newest purchase: an Einstein 3D printer from Desktop Health. Large flat-screen monitors mounted on the walls facilitate CAD/CAM design training.

Todd Reid shared his vision for the space with Handler's Rick LaDuca, who created the floor plan and then worked with Benco Dental to create the drawings and plot the workflow for the

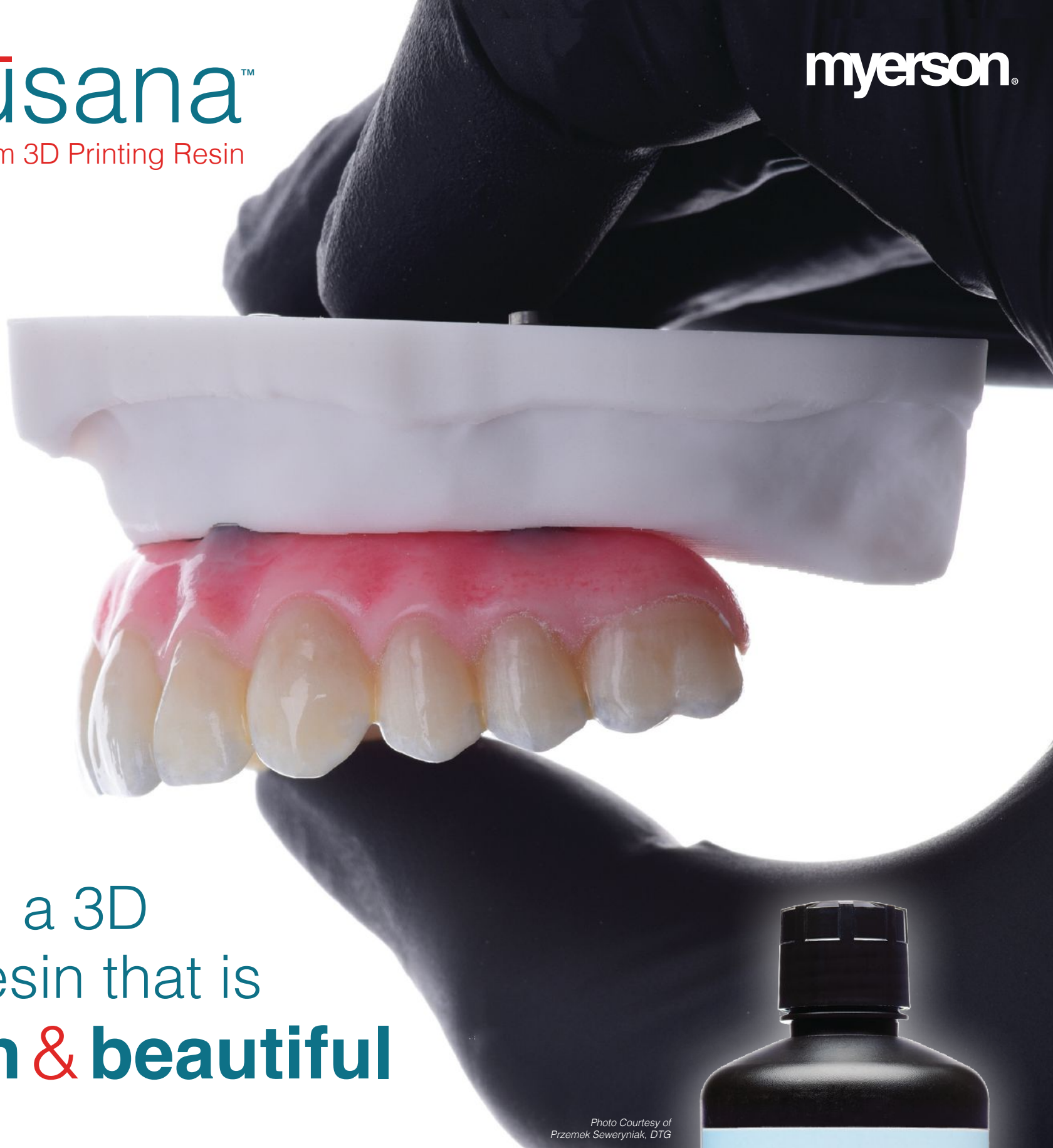


five departments. The denture (shown here) and model departments both feature Handler's ergonomic, high-performance Pro Tech Lite® brand workstations (PTL-215) and cabinetry. The workstations feature two suction options, built-in dust collector, dual shelving, LED light that retracts and swivels, power strip, storage drawers, retractable compressed air line and blow gun, gas valve and a stainless steel work surface protector.

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“Our switch from milling PMMA to printing Trusana for our provisional All-On-X cases has been a game changer for our lab. We have been able to increase our production, and the esthetics and strength we are getting from Trusana exceed anything we’ve seen from milled PMMA.”

—Jay Collins, CEO, Cornerstone Dental Lab

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