

FIVE WAYS TO SEE YOUR FUTURE AT AACD DIGITAL WORLD



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INTRODUCTION

For the first time ever, at the 26th Annual AACD Scientific Session in Grapevine, Texas, April 27-May 1, 2010, the AACD will showcase new technologies from around the globe under one roof.

How long will it be before virtually everything done in the dental office or laboratory is controlled by digital technologies? How will this impact workflow processes, and how can you best prepare to integrate existing and future technologies into your business?

AACD Digital World is a comprehensive display area of existing and future digital technologies that will shape dentistry in the years to come.

FIVE WAYS IN WHICH ADVANCED TECHNOLOGIES CAN HELP TAKE YOUR PRACTICE INTO THE FUTURE

DIAGNOSIS AND TREATMENT

Digital technologies provide unique means to detect caries and access occlusal function. Digital radiography and cone beam imaging provide data input to digitally design treatment plans and share this information between the restorative dentist, laboratory technicians, and specialists via the Internet. Not only does this help to increase predictability during treatment and fabrication, but the convenience it creates also will increase the frequency of comprehensive planning and help to promote responsible esthetics (Fig 1).

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and Extraordinary?

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What Makes Renamel Microfill Extraordinary?

- **MORE NATURAL**
Replicates enamel better than any other material
- **EASIER TO WORK WITH**
Incredible handling — material spreads like butter and does not slump
- **BETTER POLISH**
Highest polish of all composites and will retain this polish long-term
- **LONGER LASTING RESULTS**
Amazing color stability
- **RATED #1 FOR OVER 15 YEARS**
Renamel Microfill is the highest-rated composite in dentistry. This 5-star material has received “Product of the Year” award a record three times from Reality.

Incredible Color Stability

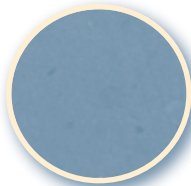


22-1/2 years later

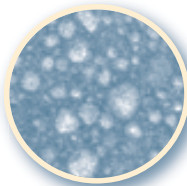
Look at the perfect color match and highly polished surface.

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Leading Nanofill Composite



The SEM image of Renamel Microfill (left) and a leading nanofill (right), both at the same 1,000x surface magnification, show Renamel Microfill attains a remarkably smooth polish.

Surface roughness of nano and microfill resin-based composites. A. Cotelan, P.H. dos Santos, A.K.B. Bedran-Russo. J Dent Res 88 (spec issue B): 592, 2009. (www.dentalresearch.org)

“Renamel has won me over... completely.

Superb sculptability, and the most awesome finish!!

And, blending at the margins... simply invisible.”

— Dr. Rumpa Wig

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DATA SCANNING

There has been a tremendous increase of digital scanning of poured casts and impressions or intraoral scanning as an alternative to traditional impressions. Digital technologies help to increase accuracy and consistency during workflow processes by eliminating the effects of inaccurate impressions, improper handling and pouring of impressions, inconsistencies of stone mixture, wear of stone casts during restoration fabrication, etc. Digital impression making can capture the most accurate information which, when processed digitally, can increase the accuracy of fabricated restorations to decrease seating adjustments and save time (Figs 2-5).

COMPUTER DESIGNING

The use of computer software to design restorations provides the laboratory technician with exceptional control. It is now possible to design very precise copings, bridge framework, and implant abutments in a variety of dental materials and full anatomy ceramic restorations. The software uses digitally captured information on preparations to accurately establish restoration margins and relationships to proximal and opposing dentition. It also allows the design of idealized coping thickness and support for porcelain overlay materials, and even designs specific thickness for the cement materials. The laboratory technician has incredible control, which increases the accuracy of fabricated restorations, saving time during restoration seating (Figs 6 & 7).

FABRICATION ENABLERS

Digital data and computer designing has a huge impact for computer assisted manufacturing (CAM). It also provides information that feeds into fabrication enablers to enhance the efficiency and accuracy of more traditional laboratory processes. Sophisticated wax and metal printing machines use the computer-designed information to create precise forms to allow accurate porcelain pressing and investment of metal copings and bridge framework.

CAM

Computer assisted manufacturing has taken over the manufacture of incredibly powerful computer chips, milling of intricate machine parts which require extremely high specification control, laser cutting of various soft to hard materials, etc. With the ability to capture data and use of computers to control design, it would be foolish not to utilize sophisticated technologies in dental manufacturing processes. Software programs today can precisely manage milling of various material restorations and enhance laboratory efficiency through continuous manufacturing without onsite supervision (Figs 8-10).

EVERYTHING DIGITAL

Computers make it possible to capture intraoral information to use in treatment planning, design restorations, and control the manufacturing of restorations, thereby minimizing variables that cause poorly fabricated, poorly functional, or non-esthetic, restorations. Digital technologies even facilitate training of dentists and laboratory technicians to elevate artistic skills to create preparations, place direct restorations, and hand-craft laboratory restorations. Continuous advances in digital technologies and educational training will create a future that benefits everyone. Patients will benefit from conservative, meticulously controlled, accurate, and responsible treatment planning resulting in better, longer-lasting restorations and improved oral health. Dental professionals will experience more convenience and reduced stress.

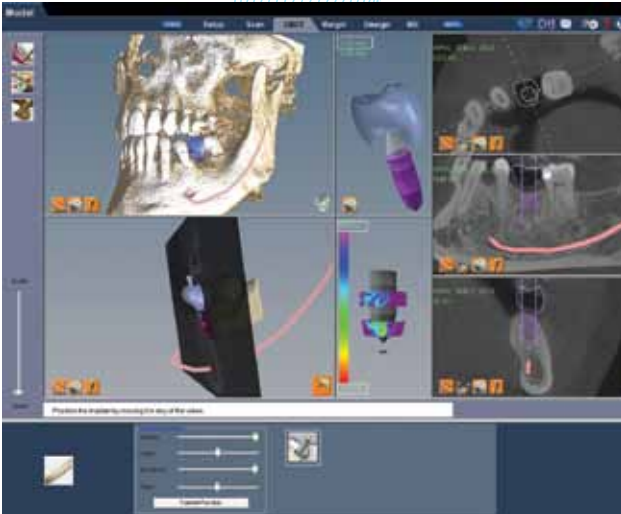


Figure 1: Implant position using E4D Compass software (D4D Technologies, LLC.; Richardson, TX).



Figure 2: iTero digital impression system (Cadent, Inc.; Carlstadt, NJ).

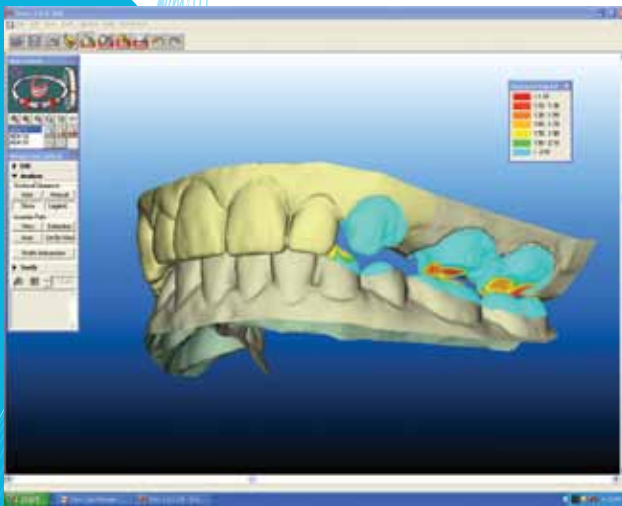


Figure 3: The iTero (Cadent) on-screen visualization of the scan in real time ensures that preparations are properly designed and that there is adequate occlusal clearance.



Figure 4: Lava chairside oral scanner (3M ESPE; St. Paul, MN). Lava "3D-in-motion" technology allows the dentist to capture and simultaneously view continuous 3D video images to create a digital impression. The system is flexible for prescribing porcelain-fused-to-metal and CAD/CAM restorations.

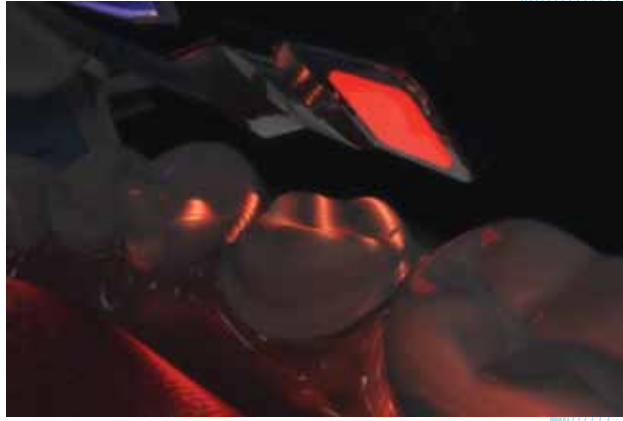


Figure 5: E4D Dentist's intraoral laser scanner (D4D Technologies, LLC).



Figure 6: Digital coping design using scans from E4D Flash 6 (D4D Technologies, LLC).



Figure 7: Lava ST Scan (3M ESPE). Precise, high-quality scanning and user-friendly software allows the laboratory technician to optimize designs for copings, implant abutments, and full contour, resulting in exceptional accuracy and fit of restorations.



Figure 8: CEREC AC (Sirona; Charlotte, NC) has high precision, ease of use, and exceptional speed, whether for single units, full arches, or anything in between.



Figure 9: E4D milling center (D4D Technologies, LLC).



Figure 10: Lava CNC 500 (3M ESPE). Computer automated milling machines continue to evolve to offer 3- and 5-axis milling and the ability to mill multiple materials. They can be programmed to run for 76 hours straight for greatest productivity.

SUMMARY

These technologies will have a tremendous impact on dental practices, as well as the working relationships dentists have with others—laboratory technicians, specialists, manufacturers and, most importantly, patients. AACD Digital World offers a tremendous opportunity to see a wide variety of such technologies. The knowledge you will gain will help you determine to what extent and in what time frame you want to incorporate them into your individual situations. But if do not attend the 26th Annual AACD Scientific Session, you may miss out on seeing your future.

If you are not registered yet, there is still time. First, book your flight to Dallas, come to the Gaylord Texan (just a six-minute drive) and register at the AACD conference registration desk. We welcome you to be a part of this highly anticipated event!

