Blue light for perfect optical impressions

CEREC AC. Once again, CEREC is setting new standards in the field of dental CAD/CAM. The CEREC system is now able to capture whole jaw arches – quickly and conveniently. This expands the spectrum of chairside applications and simultaneously fosters closer collaboration with dental laboratories, without the need for conventional tooth impressions.

The new CEREC AC acquisition centre includes a new camera plus an updated version of the CEREC 3D software (V5.46). It replaces the CEREC 3 acquisition unit. A defining feature of the new acquisition centre is the CEREC Bluacam with its innovative lens system. Instead of a conventional laser or infra-red light source the Bluacam boasts high-performance LEDs which emit blue light with a short wavelength. Each exposure triggers a sequential series of measurements which are then combined to generate the final outcome. Thanks to its increased light sensitivity, the new camera reduces the duration of the imaging process by up to 50 percent. In addition, the CEREC Bluacam delivers razor-sharp image quality – from the centre to the periphery. A built-in shake detection system ensures that if the camera is absolutely still.

Additional user benefits: The CEREC Bluacam is capable of capturing the clinical situations for four-unit bridges. This provides the basis for the chairside fabrication of long-term temporary restorations – a significant addition to the CEREC spectrum. When designing the occlusal surfaces of single crowns the CEREC 3D software analyzes the fixture alignment and cusps of the adjacent teeth, as well as the morphology of the antagonist (optional). After the design process has been completed the data can be transmitted via a wireless link to the milling unit or the in-house dental laboratory. Alternatively, the restoration data can be sent to an external dental lab via the Internet.

When the fast milling mode is selected the CEREC MC XL milling unit can machine a four-unit bridge in about 20 minutes. The new CEREC Connect web portal allows dentists to transmit optical impressions (including impressions of whole arches) to the digital laboratory of their choice. This creates the basis for model-free restorations. If required, the lab can use this data from CEREC AC in order to create its own physical models. Laboratories that do not have a CEREC milling machine at their disposal have the future option of outsourcing the model-making process to the infradent manufacturing service. CEREC Connect and the new CEREC AC are the ideal entry solution for new users. The CEREC system can then be successively upgraded. On the basis of the digital impressions submitted by dental practices external laboratories are in an ideal position to fabricate all-ceramic crowns and bridges using the sophisticated inLab milling unit.

CEREC, the CEREC MC XL milling unit, the new CEREC 3D software and CEREC Connect represent an unrivalled combination and set new standards in restorative dentistry. The user-friendly features of these CEREC components promote a seamless and efficient workflow. In addition, they open up new possibilities for efficient and profitable collaboration with external dental laboratories. The modular design of the CEREC system, its continuous development and the full compatibility of all the various components (including the inLab system) ensure optimum flexibility as well as a sustained return on investment.

CEREC AC, modern, user-friendly design, plus unprecedented precision.
Razor-sharp full-arch impressions in just a few seconds

BLUECAM TECHNOLOGY: The tried and tested triangulation principle has been further developed for the new CEREC AC acquisition centre. The scans are faster, sharper and more accurate – thanks to the aspherical lens system and short-wavelength light. This provides the basis for acquiring full-arch impressions for the impression free dental practice.

What are the benefits for the CEREC user? Expressed briefly, the imaging process is much faster, the optical impressions are more precise (a prerequisite for an optimum fit), and full arches are more precise (a prerequisite for an optimum fit). The scans are faster, sharper and more accurate – thanks to the aspherical lens system and short-wavelength light. This provides the basis for acquiring full-arch impressions for the impression free dental practice.

User-friendly features save valuable time

The CEREC Bluecam is easy to use and hence speeds up the treatment workflow. The blue light enables the user to pinpoint the imaging site. The measuring depth has been increased by 20 percent. The depth of field is 14 millimeters. It is not necessary to maintain a prescribed clearance between the camera and the tooth. Instead the Bluecam can be placed directly on the tooth with the help of a small support. This makes it easier to acquire images in the distal area. The CEREC Bluecam can acquire optical impressions of all areas of the oral cavity that are inaccessible to cameras with a divergent light beam.

Blurred images can be practically ruled out. The built-in shake detection system triggers the exposure only when the camera is absolutely still. The user simply moves the camera continuously along the jaw. It is no longer necessary to depress the foot switch or closely coordinate the movement of the eye and foot. As a result an entire quadrant or arch can be acquired very quickly, resulting in time savings for the dentist. The sensitivity of the shake detection system is adjustable. This enhances the overall precision of the virtual model – especially when several images are superimposed. Thanks to the automatic exposure function and the extensive depth of field of the camera, the entire impression-taking process prior to the actual preparation can be delegated to an assistant. This results in a seamless and efficient practice workflow.

Outstanding precision, plus a broader range of indications

The basis for optimum CAD/CAM restorations is the accurate scanning of the preparation and the adjacent teeth. The short-wavelength blue light emitted by the CEREC Bluecam delivers optical impressions of unprecedented precision. In vitro studies carried out at Zurich University have revealed that the optical impressions generated by the CEREC Bluecam deviate by only 19 microns (standard deviation: 6 μm) from measurements derived from a reference laser scanner. Nineteen microns are less than one third of the diameter of a human hair. This high degree of precision ensures an excellent accuracy of fit, speeding up the adhesive bonding process and reducing the amount of excess luting composite that needs to be removed.

In addition, the CEREC Bluecam images are virtually distortion-free (also in the peripheral areas). The system can superimpose an unlimited number of images and thus generate virtual 3D models of quadrants and full arches. This allows dentists to expand their treatment portfolio. For example, they can now offer their patients temporary bridges with up to four units – created directly at the chairside without the need for a conventional impression. In future dentists will also be able to send digital small, data transmission is quicker and simpler than ever before. During the imaging process the software analyzes each image pixel by pixel and selects the optimum data. Standard image files are automatically deleted. As a result the data volume of a virtual upper or lower jaw model can be reduced to approx. 25 megabytes.

Always a step ahead

FUTURE PROSPECTS. CAD/CAM has revolutionized dentistry. The proportion of inlays and onlays has risen sharply. Fewer crowns are being used, even in the USA. Dr. Wilhelm Schneider, who prior to his transfer to the Imaging Systems Division of Sirona was the Marketing Manager for CEREC, looks ahead to the future of dental CAD/CAM technology.

The integration of CEREC in diagnosis and therapy

CEREC & GÄULIEOS: 3D planning of implants

inLab & inInfiDent: Fabrication of all restoration types

CEREC & inLab: Implant superstructures (custom abutments, temporary crowns, bridges)

CEREC Connect: Optical impressions (digital CEREC AC impressions)

CEREC GÄULIEOS is a computer-aided surgical planning and guided implant placement system that has been developed by Sirona. It has already established itself as the market leader throughout Europe. CEREC GÄULIEOS prepares the patient’s bone bed for implant surgery in an optimally spatially exact manner. The implant planning can be satisfactorily resolved with good clinical results. Many of the system’s features are based on CEREC technology and the software is provided by the same company.

The capabilities of CEREC extend far beyond chairside restorations. Indeed, CEREC is all set to become the central restoration system for dental practices – a system which interfaces directly with diagnostics, implant therapy and external dental laboratories. CEREC is an open and adaptable system. New indications such as integrated implant planning can be satisfactorily resolved with good clinical results.

CEREC meets GÄULIEOS

Three-dimensional GÄULIEOS CBCT images are superimposed with optical impressions generated by the CEREC camera. This will allow dentists to perform prosthetic planning and surgical planning simultaneously. Initially, this process will take place manually. Over time, however, the software will acquire more and more ‘smart’ functions.

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For more than 20 years the CEREC system has spearheaded developments in computerized all-ceramic dentistry. This success story has encouraged other companies to follow suit and launch their own CAD/CAM systems and consumables. This in turn provides a strong incentive to maintain CEREC’s technological leadership and open up new avenues in computerized dentistry.

Increased range of indications

Originally regarded as an “inlay machine”, CEREC has proved to be especially advantageous with regard to onlays, which are a substance-conserving alternative to conventional crowns. Chairside onlays will enjoy increasing popularity due to their numerous clinical and economic benefits. Veneers – the minimally invasive alternative to anterior crowns – have become firmly established in CEREC practices with their own in-house laboratories. In the very near future CEREC will allow dentists to fabricate and incorporate temporary bridges with up to four units – directly at the chairside and during a single appointment. In the medium term tooth-conserving Maryland-type bridges will also become established.

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Taking a perfectly designed crown as its basis the software will propose the position, dimensions and alignment of the implant. The dentist will then verify the surgical feasibility of this proposal. In the event of conflicts he can refer directly to the monitor image and discuss the available alternatives (e.g. bone augmentations) with the patient. The dentist also has the option of ordering a surgical guide from an external production center. In the medium term it will be possible to create surgical guides in-house with the aid of the inLab system. This workflow will ensure a high degree of reliability – and hence will soon become standard practice. In the middle of 2009 a software upgrade will become available which allows superimposition of CEREC and GALILEOS images.

Custom abutments
When placing an implant dentists aim to achieve the best possible outcome – in clinical terms and on a cost-effective basis. Custom abutments made of ceramic materials play a key role in this respect.

The first steps have already been taken, as evidenced in Sirona’s inLab system. In the course of the current year new solutions will become available for internationally available implant systems.

CEREC Connect
Only a small percentage of dentists actually want to create the complete spectrum of CEREC chairside restorations in-house. Close collaboration with external dental labs is a decisive success factor. Via the user-friendly CEREC Connect web portal dentists now have the option of sending optical impressions to a laboratory of their choice. The lab can either order the physical model from a central production facility – or else produce the model directly on the premises with the help of its inLab milling system. In both cases the dentist’s optical impression delivers the necessary data. In the long run the laboratory will not need the physical model at all. CEREC Connect is already up and running in the USA. The necessary infrastructure will be created in other countries in the course of the current year. CEREC Connect is available free of charge to CEREC users.

CEREC is undergoing a transition – from a chairside-oriented system to a central tool for cost-effective collaboration between dental practices and laboratories. It will soon be possible to cater for the complete spectrum of clinical applications – from a simple inlay to a long-span bridge, and from a single implant to a complex smile design procedure. It goes without saying that the CEREC system makes allowance for the antagonists and the patient’s individual articulation. It is already possible to acquire optical impressions of static and dynamic bite registrations – a prerequisite for designing perfect occlusal surfaces. But CEREC has by no means reached the limits of its development potential. Virtual articulation – possibly with reference to cone beam computer tomography (CBCT) images – is already on the horizon. And, who knows, somewhere in the world a CEREC user may already be thinking of ways to integrate the neuronmuscular system into the design process.

As we said before, CEREC is on the way to becoming the central restoration system for dental practices. On the one hand, CEREC interfaces with modern diagnostic systems. On the other hand, CEREC provides the basis for the manual and computer-aided manufacture of all types of restorations. This will result in more effective, economical and user-friendly dental treatment. Patients will be willing to invest their hard-earned money in such services.

Digital model-making processes

CEREC CONNECT. The traditional modus operandi between dentists and dental technicians – i.e. the production of tooth models on the basis of a conventional impression – is expensive, time-consuming and error-prone. Via the CEREC Connect web portal CEREC users are now in a position to transmit digital impressions to an external dental laboratory, which then produces the restoration.

Prepare the tooth. Take a conventional impression. Fill in the order form. Send it off to the laboratory. This procedure may soon be a thing of the past. Launched at the 2008 Chicago Midwinter Meeting, the CEREC Connect web portal allows dentists to transmit digital impressions acquired using the CEREC camera to a dental lab of their choice. The lab then produces the restorations to the dentist’s specifications. Numerous dental practices have already signed up for this new service in the USA.

CEREC Connect not only saves time and money. It is also more pleasant for the patient and eliminates potential sources of error. A wide range of restoration types are now available via www.cerec-connect.com – for example including all-ceramic anterior crowns, lithium disilicate crowns and provisional bridges with up to three units. The craft skills of a dental technician still play a decisive role, especially with regard to aesthetically challenging anterior restorations. On the other hand, these restorations can now be produced entirely on the basis of digital impressions – i.e. physical models are no longer required. The infiniDent manufacturing service has made an additional important to its portfolio. With the aid of the new CEREC AC and the CEREC Bluecam dentists are now in a position to acquire complete quadrants – with such outstanding precision that infiniDent can now create physical models on the basis of digital impressions alone. This greatly simplifies the design and fabrication of layered anterior and posterior crowns, as well as zirconium oxide bridge frameworks with up to four units.

When processing the data delivered by the CEREC Connect software infiniDent deploys a special stereolithography machine. This machine uses a computer controlled laser to cure a photo-sensitive resin, layer by layer, in order to create the 3D model.

Models made of light-cured resin
The process could not be simpler. Using the CEREC Bluecam the dentist acquires digital impressions of the preparation and the antagonist. On the basis of just one overlapping image the software is capable of computing both half arches. After checking the 3D model on the monitor, the dentist then clicks the “Send” button, enters the order details and uploads the data to the CEREC Connect portal.

Before downloading the data from CEREC Connect, the dental lab decides whether or not an intermediate model is required. If not, the dental technician can begin fabricating the restoration immediately.

CEREC Connect launched in Chicago in 2008.

Models sourced to infiniDent
If the laboratory needs a model (e.g. for a zirconium oxide bridge framework), it simply places a corresponding order with infiniDent. Using the 3D data supplied by the laboratory infiniDent produces the model out of an acrylic material. In the meantime the laboratory can design, mill and sinter the bridge framework. As soon as the model is received from infiniDent the technician makes the final adjustments to the framework and then applies the veneer facing.

infiniDent supplies the models in the form of pinned sawcuts mounted on a perforated basis. The laboratory places these models on a suitable articulator in order to simulate the final occlusion. In other words, the situation mapped by the dentist can be exactly replicated in the laboratory. This means that the technician is in an ideal position to fine-tune the restoration.

Before dentists and dental laboratories can start collaborating they need to register with CEREC Connect. The relevant contact details and delivery addresses are stored on the website. Dental laboratories also have an opportunity to publish their range of services.

The new CEREC Connect software, the new inLab software and the CEREC AC acquisition centre will figure prominently at the 2009 Chicago Midwinter Meeting. At present CEREC Connect is only available in the USA. The service will be extended to further markets in the near future.
Focus on the user

CUSTOMER BENEFITS. Not all new products and product enhancements create genuine value added for the user. By contrast, Sirona’s product developers are totally committed to delivering perceivable user benefits. The CEREC AC acquisition centre is a good example of this.

The prime goal of conservative dentistry is to achieve the best possible restoration quality. The accurate fit of a restoration depends on the skills of the dentist and/or dental technician – and on the precision of the equipment they use. The CEREC AC acquisition centre from Sirona sets new standards in this respect. The new CEREC Bluecam creates high-precision and distortion-free optical impressions of the preparation margins. The system is capable of combining an unlimited number of images, thus allowing whole quadrants to be acquired. This function expands the spectrum of chloride indications to include four-unit temporary bridges. No special skills are required in order to operate the CEREC Bluecam.

Thanks to the extensive depth of field the user does not have to maintain a prescribed distance between the camera and the tooth. Instead the camera can be placed directly on the tooth with the help of a handy support. This makes it much easier to acquire images in the distal area. The automatic shake detection function triggers the exposure only when the camera is motionless. As a result the dentist has the option of delegating the optical impressions to his assistant, thus leaving him free to concentrate on more complex treatment aspects.

In addition to being easy to use the new CEREC AC acquisition centre is fast and efficient. An entire arch can be scanned in less than one minute. Thanks to the optional uninterrupted power supply, the CEREC AC can continue working for up to six minutes while disconnected from the mains. After the milling process has been initiated the acquisition centre can be wheeled into the next treatment room ready to take the next optical impression. A further advantage is that no data will be lost in the event of a power cut.

Numerous Sirona products have won prestigious industrial design prizes. The CEREC AC also sets new standards in terms of aesthetics. Its user-friendly features include a large-sized monitor, a user-friendly keyboard and a compact footprint. In short, the CEREC AC is the perfect complement to a modern practice interior.

The sleek lines of the CEREC AC complement modern-practice interiors.

The automatic capture system prevents blurred images.

Thank to its user-friendly design, the CEREC AC promotes a relaxed mode of working. The graphical user interface has been updated with a fresh new look to increase the ease of use of the software.

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Spray instead of powder

CONSUMABLES. The easy-to-use CEREC Optispray enables precise optical impressions.

A precondition for accurate imaging performance is a non-reflective surface. Until now dentists have been compelled to use a titanium dioxide powder or special spray-on products. Improper use can compromise the quality of the optical impressions. To eliminate this problem Sirona has introduced CEREC Optispray. This product has already evoked a very positive response from users.

High-precision coating
CEREC Optispray is ideal for achieving a very homogenous coating of the preparation site. It prevents the formation of “puddles” in the cavities and “snowdrifts” (a frequent problem with powders). In addition, it is not necessary to apply a bonding agent. Hence no prolonged drying times are required. The optical impressions display a high degree of conformity, especially along the preparation margins. This has a positive impact on the accuracy of fit.

Simple handling
Optispray is an all-in-one solution – i.e. no additional items of equipment have to be laboriously assembled. The ergonomic, swivelling nozzle is not prone to blockages. In the interests of effective infection control the nozzle can be easily replaced after each patient. Once the optical impression has been acquired CEREC Optispray is easy to remove as it is water-soluble. This results in additional time savings for the dentist.

CEREC Optispray has been optimized for the new CEREC Bluecam. The camera generates bright, high-contrast images of the preparation, due to the ultra-thin layer.

The ultra-thin coating enhances the performance of the CEREC system.

The perfect partner for CEREC AC and CEREC 3

SOFTWARE. To ensure that users fully reap the benefits of the new CEREC Bluecam Sirona has made further enhancements to its CEREC 3D software. As a result CEREC is easier to operate than ever before. The software incorporates a number of sophisticated features geared to the long-standing wishes of experienced CEREC users.

The milling preview has been modified in the new Version 3.40 of CEREC 3D. It is now divided into three sections. In the first section the user can select the milling unit he wishes to use (in cases where more than one milling unit is available). In the second section the user is able to view the restoration within the block and adjust its vertical position. The polychromatic layering of the block is also displayed. This gives the user a valuable insight into the shading of the finished restoration. In the third section of the milling preview the user can determine the location of the sprue in accordance with the clinical indication and the shape of the restoration. In short, the new CEREC 3D software represents a significant step forward – for experienced users as well.

Substandard images are automatically eliminated.

Taking optical impressions is now easier than ever.

The user can manually adjust the preparation margin and insertion axis.

The new restoration dialogue, including bridge option.

The images placed on the dockbar create a 3D preview model.

Optimized for the CEREC AC Optispray.

The easy-to-use CEREC Optispray enables precise optical impressions.

The most important aspect is that these components are all compatible with each other. The user can adopt CAD/CAM technology without running the risk that his existing hardware will soon become obsolete. On the contrary, he can rely on receiving a sustained return on investment. What’s more he is in a position to combine the various components in line with his specific requirements and can upgrade his CEREC system at any time. In addition, he can rest assured that CEREC will remain at the forefront of technological progress. CEREC is capable of performing every procedure that is currently possible in the area of restorative dentistry.

The success story

In 1980, CEREC began as the fascinating idea of two pioneering inventors. Meanwhile CEREC has become a technically sophisticated restorative dental procedure which is clinically recognized and applied all over the world. Around 4.5 million CEREC restorations have already been created and fitted. Approx. 8,000 new restorations are created every day.

At the end of the 1990s, after two successful product generations, Sirona launched the modular CEREC 3 system. To exploit the continuous improvements in computer hardware and software, the company decided in favour of an open platform approach and will thereby provide a user-friendly interface.

In addition, the software allows the user to select the milling unit he wishes to use (in cases where more than one milling unit is available). In the second section the user is able to view the restoration within the block and adjust its vertical position. The polychromatic layering of the block is also displayed. This gives the user a valuable insight into the shading of the finished restoration. In the third section of the milling preview the user can determine the location of the sprue in accordance with the clinical indication and the shape of the restoration. In short, the new CEREC 3D software represents a significant step forward – for experienced users as well.
TENEO. Simplicity redefined.

SIROLaser delivers excellent results in connection with ceramic restorations

PRACTICE REPORT. If bleeding occurs during impression-taking and treatment, this can have a serious impact on the quality of ceramic restorations. The CEREC user Dr. Helmut Goette deploys the SIROLaser to overcome this problem. In this article he describes his therapy approach with reference to a typical case.

Today, lasers are widely used in endodontics, periodontics and dental surgery. Sirona’s compact and powerful SIROLaser now plays an indispensable role in my CEREC treatment procedures. I use it for haemostasis purposes and to define the preparation margins.

It is essential to prevent bleeding at all stages of the CEREC procedure. The contamination of the anti-reflective powder with blood during impression-taking is especially critical. The data can be flawed, resulting in incorrect height readings and inaccurate dimensions of the proximal box. To achieve an absolutely clean environment I apply a rubber dam and use the SIROLaser to arrest any bleeding.

Bleeding is especially problematical during adhesive bonding. Blood and saliva contamination can destroy the etched microretentive enamel and dentine surfaces. Proper adhesive bonding is then impossible, and treatment failure is the consequence. A combination of the SIROLaser and a rubber dam effectively rules out such contamination.

Case study: haemostasis prior to impression-taking

A 38-year-old male patient came to my dental practice complaining of bite oversensitivity in tooth 25. The oral examination revealed an extended glass ionomer filling with a replacement palatal cusp and a missing mesial contact point. I recommended a replacement filling, as glass ionomer is not indicated for cusp replacement and this was the cause of the oversensitivity. The tooth was vital. An X-ray did not reveal any signs of periodontitis.

After the defective filling had been removed copious bleeding occurred in the mesial proximal box (Fig. 1). For this purpose I selected the “Periodontology” program preset (2.5 W and 75 Hz). In addition I prepared a distal box, and defined an additional preparation margin with the aid of the SIROLaser.

The outcome was a clear and dry representation of the operation site for the preparation. The CEREC optical impression yielded a clearly defined 3D model. The automatic detection function had no trouble in marking the preparation margins (Fig. 3). Thanks to the rubber dam, the optical impression and the adhesive bonding of the restoration were performed under absolutely dry conditions (Fig. 4). I chose CEREC Blox (shade: S2-M) for the restoration. Adhesive bonding was performed by means of Syntac-Heliobond (Vocolar Vivadent) in combination with Tetric EvoCeRam (Vocolar Vivadent), shade A2. The restoration was inserted with the aid of an ultrasonic handpiece. Haemostasis remained effective throughout the treatment process. As a result, repeated laser therapy was not required prior to adhesive bonding.

To sum up

I have used the SIROLaser for CEREC treatment with great success since its introduction around three years ago. It is ideal for haemostasis during impression-taking and treatment, as well as for gum contouring and for the correction of the preparation margin.

A further step towards metal-free dentistry

Interview. CEREC Zeitung asked Dr. Bernd Reiss, one of the earliest CEREC adopters, to evaluate the new CEREC AC acquisition centre.

Dr. Reiss, in your role as a tester and user, you have accompanied the evolution of the CEREC system from the very beginning. What benefits does the new CEREC AC offer to users?

Compared with the old acquisition unit, the CEREC AC is a genuine step forward. This is due above all to the new camera technology, which generates unprecedentedly precise 3D images. In addition, the CEREC AC lays the foundations for a whole range of developments with great future potential: large-sized chairside restorations; the automation of functional-occlusal surface design; full-arch scans; and the “impression-free” dental practice – to give you just a few examples.

What are the main features of the CEREC AC?

The imaging technology has been redefined. It is so intuitive and easy to operate that new users will have no problems getting to grips with the new CEREC AC. Indeed, I’d even say that established CEREC users face more of a challenge when making the transition to the new system. I am very impressed by the high camera resolution. This has led to enhanced image quality and an enhanced visualization of the preparation. In addition, the software skilfully combines various display modes.

How will these advantages make themselves felt in practice?

The treatment process has become simpler and more convenient. One example is the optional uninterruptable power supply. The CEREC AC can be disconnected from the electricity mains for several minutes – time enough to wheel the unit into another treatment room after the milling process has been initiated, leaving the dentist free to concentrate on other tasks.

How does the CEREC procedure differ from other CAD/CAM methods?

What sets CEREC apart from other methods is the possibility of performing complete chairside treatment during a single appointment. In other words, the patient leaves the practice with a finished restoration. More important in my view are the clinical aspects. Direct chairside restorations stabilize the healthy tooth tissue – also in the case of very thin walls and undermined cusps. This allows the dentist to adopt a conservative, defect-oriented preparation approach. In addition, temporary restorations can lead to the contamination of the healthy tooth tissue. This in turn has a negative impact on the bonding mechanism. In other words, dispensing with temporary restorations has a positive effect on the adhesive bond and the longevity of the restoration.

Why should dentists opt for all-ceramic CAD/CAM restorations?

The future of dentistry lies with metal-free restorations. It is illogical to use metals in cases where mineral materials of equivalent quality are available. Tried-and-tested CAD/CAM methods play a key role here. Thanks to the new CEREC AC acquisition centre, CAD/CAM technology has become even easier to use.

Dr. Reiss, thank you for giving your assessment of the new CEREC AC.
Function, articulation and CAD/CAM are converging

CONGRESS REPORT. Reconstructive occlusal surface design and functional articulation have become easier and more practicable – this consensus was reached by the leading CEREC proponents Professor Werner Mörmann and Professor Alexander Gutowski at the 16th Annual Meeting of the German Society of Computerized Dentistry (DGZC) in Ettlingen.

During his lecture Professor Gutowski emphasized that “occlusion is not everything, but without occlusion you’re left with nothing.” Prior to each restoration, he argues, the dentist should closely examine and document the clinical situation of the teeth, checking for pathological findings in the tissues surrounding the teeth, and examine the TMJ for any disfunction. Possible courses of therapy include the milling of the occlusal surfaces and the application of bite splints. Other possibilities include reconstructive occlusal modifications, bite elevations, orthodontic procedures and – in the case of TMJ disorders – disc repositioning. According to Gutowski, computer-aided diagnosis and restoration procedures have significantly simplified the functional analysis process.

Professor Werner Mörmann, Zurich, reported on the “fast mode” of the CEREC MC XL milling unit, which permits a molar crown to be completed in six minutes. According to Mörmann, fast milling leads to different effects in ceramic materials. During milling trials the glass ceramic material Empress CAD displayed slightly reduced strength. However, this is not clinically relevant. No changes were observed in feldspar ceramic (VITA Mark II). Mörmann established that the fast mode increases the rate of wear of the diamond burs. Hence shorter milling times are set against increased tool costs.

An adhesive, all ceramic bridge replacing teeth 12 and 22.

Digital technology will determine the future of dental practices and laboratories – this was the unanimous conclusion drawn by the experts who attended the 16th Annual Meeting of the DGZC. Reconstructions of the occlusal surfaces and the application of bite splints. Other possibilities include reconstructive occlusal modifications, bite elevations, orthodontic procedures and – in the case of TMJ disorders – disc repositioning.

Dr. Hans Müller, Munich, biogeneric reconstruction provides the basis for creating individual occlusal surfaces for inlays, onlays and partial crowns. As the biogeneric design function is not yet available for crowns, Müller uses the CEREC crown design tool in the case of orthognathic tooth alignment and normal occlusion. For this purpose he selects adult and juvenile shapes from an extensive collection of prosthetic teeth. Adhesive bridges number among the most complex prosthetic procedures – above all in the aesthetically challenging anterior region. The dentist Peter Neumann, Berlin, presented various examples of chairside-manufactured, two-wing adhesive bridges made of lithium disilicate. In his view adhesive bridges offer two key advantages: firstly, future treatment options are left open; secondly, the attachment to the adjacent teeth is non-invasive or minimally invasive.

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Rethinking entrenched opinions

**PRACTICE PROFILE.** Dr. Michael Tessmer had reservations about chairside CAD/CAM technology – until his colleagues persuaded him to rethink his opinion. This case underlines the benefits – for dentists and patients – of investing in modern treatment procedures.

A clever man once said, “Only a truly experienced person can distinguish between the useful and the useless.” Applied to Dr. Tessmer this means that he is now performing treatment procedures that he did not learn at university or during his dental training.

After completing his university studies and clinical training Dr. Tessmer set up a dental practice with the goal of providing high-quality treatment services and achieving reproducible therapy outcomes. Given his uncompromising dedication to quality, he approached all-ceramic CAD/CAM systems with a degree of scepticism: “I preferred to order all-ceramic inlays and crowns from a dental laboratory. CEREC was uncharted territory for me – until last year.”

A friend of Dr. Tessmer’s (who had trained as a dental technician before studying to be a dentist) already deployed the CEREC CAD/CAM system to fabricate inlays and crowns. Given his laboratory-trained background, this friend devoted top priority to the occlusal surfaces and the accuracy of fit. Reports on his chairside restorations in scientific journals attracted the attention of fellow dental professionals. Dr. Tessmer was very impressed by the photographs sent to him by his friend. The accuracy of fit and the occlusion were so outstanding that Dr. Tessmer even doubted that digital technology had actually been deployed.

Dr. Tessmer decided to visit his colleague’s practice and find out more about the benefits of the CEREC 3 system. “I was amazed and could hardly believe that this machine was capable of reproducing an accuracy of fit in the region of 50 - 50 microns.” Dr. Tessmer explains. In order to gain hands-on experience he treated two patients using the CEREC 3D system. He prepared the cavities in line with the recommendations for pressed ceramics.

On the basis of optical impressions of the residual tooth tissue the system retrieved the cusps and fissures from the built-in tooth library and proposed individual occlusal surfaces that were automatically adapted to the antagonist. The restorations were milled out of silicate ceramic blocks in just 20 minutes. This was followed by polishing and adhesive bonding. After just one hour the patients left the practice – with finished restorations and not with fragile temporaries. The restorations were perfect in terms of fit and occlusion. Adjusting the contacts and final polishing took just three minutes. What impressed him most of all was the patients’ look of gratitude when they took a look in the mirror. “And there was really no need for an impression, Dr. Tessmer?”

After this positive experience Dr. Tessmer decided to use the CEREC system. He soon discovered that the triangulation camera can acquire the preparation margins much more accurately than can the human eye. It is also possible to combine optical impressions as a basis for resturting entire quadrants (e.g. when replacing amalgam fillings with ceramic inlays).

The patients are very relieved that they can be completed during a single appointment. To stay abreast of technological developments Dr. Tessmer decided to lease his CEREC system for four years – and this is already paying dividends. Each CEREC restoration yields a positive contribution and generates resources for future investments. The patients also benefit. CEREC restorations are long-lasting and fulfil the highest aesthetic standards. Dr. Michael Tessmer sums up his experience as follows: “Whenever I encounter dentists who have not yet adopted CEREC, I like to quote the famous phrase coined by Mikhail Gorbachev. ‘Life punishes those who act too late’. I also regularly invite interested colleagues to test the CEREC system in my dental practice at the weekends. In this way we can discover how much fun it is to work with the latest technology.”

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