

laser or L.E.D.?

laser

The E4D Dentist system is the only CAD CAM system that uses a true laser for scanning hard and soft dental tissue, impression material, bite material and dental stone. It combines laser technology with micro-mirrors developed exclusively for D4D Technologies by Texas Instruments. The mirror system allows a single laser point to be generated across a large area in a patterned approach thereby eliminating any speckling or diffusion of the laser point.



The E4D Dentist system uses a laser to capture without powder

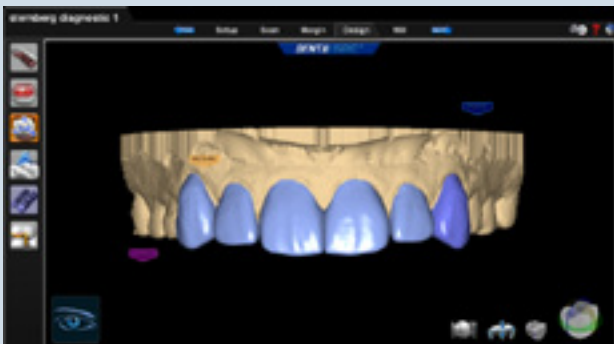
The E4D Dentist system's laser does not require a contrast agent (powder) and can capture intraorally (hard and soft tissue) as well as off any conventional impression, bite registration, or model material. This provides the clinician complete control of the restorative procedure and provides the patient with added comfort, convenience and performance.

Laser

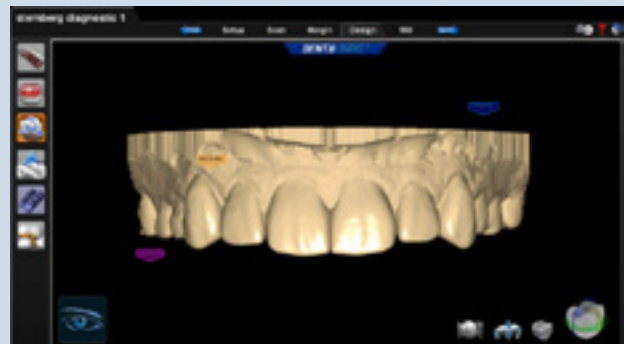
A laser is a device that emits light (electromagnetic radiation) through a process called stimulated emission. The term laser is an acronym for light amplification by stimulated emission of radiation. Laser light is usually spatially coherent, which means that the light either is emitted in a narrow, low-divergence beam, or can be converted into one with the help of optical components such as lenses. The coherence of typical laser emission is distinctive. Most other light sources emit incoherent light, which has a phase that varies randomly with time and position.

Blu-ray uses a "blue" (technically violet) laser operating at a wavelength of 405 nm to read and write data. Conventional DVDs and CDs use red and near infrared lasers at 650 nm and 780 nm respectively.

Once captured the 3D data is displayed as a virtual model. The powerful DentaLogic software allows operators to design as many as 16 units at once, and switch back and forth to select any tooth to alter the design.



View and edit multiple restorations at once.



The Medusa feature turns all restorations to stone for viewing form

LED

The CEREC® AC Bluecam system uses a Moiré interferometry-based “structured visible light” technology that projects varying intensity fringe patterns onto an object being imaged. In this approach, the height of a point on a particular 3D contour on a model is correlated to the reflected intensity of the projected pattern at that point. Any color variations (not related to height) on the object result in an incorrectly computed height of the 3D surface at that point. For this reason, in the CEREC® chairside approach it is important to obtain a good contrast image of the object being scanned. A “contrast agent” must be applied to the object to enable the acquisition of a good contrast image; this is typically powder. The contrast agent must have 100% opacity and 100% uniformity of color, so that it reflects the projected image and nothing more.



Moiré Pattern



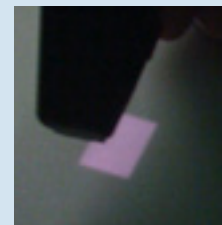
With a top down scan, there will be “dark holes” below the height of contour where no data is captured from the top down perspective. These areas will be interpolated/manufactured by the software to complete a virtual model.

Instead of using an infrared LED for invisible illumination the bluecam features a blue LED for illumination (visible). Other improvements have been reported to improve the resolution of the data from the previous CEREC® models.

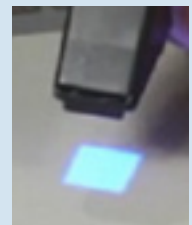
Light emitting diode (LED)

A light-emitting diode (LED) is an electronic light source. LEDs are available across the visible, ultraviolet and infrared wavelengths, with very high brightness.

Applications of LEDs are diverse. They are used as low-energy replacements for traditional light sources in well-established applications such as indicators and automotive lighting. The compact size of LEDs is an advantage for text and video displays and sensors, while their high switching rates are useful in communications technology.

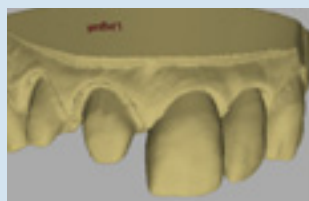
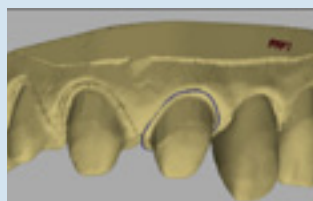


CEREC® 3-D Infrared light pattern (night vision capture)



New CEREC® AC bluecam blue LED pattern

Once captured, the “top down” data is displayed as a virtual model with absent areas filled in with interpolated data. Although the new CEREC® AC bluecam allows for faster capture of powdered quadrants and full arches, the design software still only allows a “one tooth at a time” design sequence, requiring the operator to virtually seat one restoration at a time, then open the software again for each tooth to be designed. At no time can the operator see and design all the restorations at once.



With the CEREC system and multiple restorations, each tooth must be designed, virtually seated, a new version of the software opened and the next restoration can be started.

| E4D® Dentist | CEREC® 3D | CEREC® AC Bluecam |
|--|--|--|
| laser scanning | Moiré/infrared | Moiré/blue light |
| powder free | requires contrast agent | requires contrast agent |
| wireless mouse | trackball | trackball |
| integrated foot pedal | integrated foot pedal | integrated foot pedal |
| remote foot pedal | not available | not available |
| Rapid Scan™ | not available | Automatic Capture |
| 17" screen | 17" screen | 19" screen |
| intraoral scanning | intraoral scanning w/powder | intraoral scanning w/powder |
| model scanning | model scanning with powder or special model material | model scanning with powder or special model material |
| impression scanning | cannot scan impression | cannot scan impression |
| 7 color themes available | One color theme | One color theme |
| VOIS™ - Bluetooth technology Voice Over Internet Support | | integrated microphone |
| up to 16 units live edit | virtually seat one by one | virtually seat one by one |
| not "tied" to mill, so power- ing down and moving will not disrupt milling | Acquisition unit and mill linked, cannot power down | 5 minutes battery back up |
| Centralized Education Center | trainers/Local | ? trainers/Local |
| SOS and VOIS Remote Support | www.cerecdoctors.com | www.cerecdoctors.com |
| Henry Schein Dental | Patterson Dental | Patterson Dental |

Cerec ®, Patterson Dental ®, AC Bluecam ®, cerecdoctors ® are not registered trademarks at D4D Technologies.