

OUR LATEST CUSTOMER-DRIVEN FEATURES



Introducing Our Latest Updates

Carestream Dental is pleased to announce the latest developments to the CS 3600 family via the intraoral 3D acquisition software, version 3.1.0. Designed to improve the user experience, this software release allows end users to always be up to date with the latest workflow advancements while enjoying significant feature enhancements. Carestream Dental can provide updates like these by making astute investments in research, development and design.

Availability of 3D intraoral scanner acquisition software version 3.1.0

The version 3.1.0 software update is a chargeable update that requires enrollment in CS Advantage, which is good news for CS Advantage plan members: they can acquire the update free of charge.

Any users who have subscribed for CS Advantage plan will automatically receive an email with the link to upload version 3.1.0. For customers who are not currently enrolled in a CS Advantage plan and are interested by this particular release, a one-time software update can be purchased from Carestream Dental through reference # 6577290.



CS Advantage



CS Protect



CS Update



CS Support

Workflow enhancements

The Select Acquisition Type window has been redesigned to better segment the four distinct workflows, including Orthodontics, Implant, Restoration and Import. Users can see an expanded menu of options specific to each workflow by hovering over their workflow of choice.



Select Acquisition Type window

Scanning speed improvement

With version 3.1.0, the amount of time it takes to acquire and process a digital impression is up to 22% faster, depending on the acquisition computer used.¹ Additionally, CPU usage is reduced by 20-50 percent, depending on the configuration of the capture computer.



Scanning sound option

For practitioners wishing to hear an audible notification when the scanner is actively scanning and acquiring data, a new Scanning Sound option is now available. Accessible from the Preferences menu, the Scanning Sound can be set to no sound, a scanner beep or a PC Sound.

Selecting PC Sound will allow for the selection of a sound effect including a song of the scanner user's choice in WAV format from a drop-down menu for a truly customized scanning experience. Practitioners can create a relaxing environment with soothing songs or add excitement to their scanning routine with upbeat music—the possibilities are endless. Additionally, the volume setting can be adjusted from the Preferences as desired.

Once a sound is selected, the laptop will play a sound when the scanner is actively scanning and acquiring a dataset.



New Scanner Preferences

Note: The PC sound option requires the use of a computer that is equipped with functional speakers.



PRO TIP:

“Create a spa-like environment for your patients by selecting soothing sounds for a relaxing scanning experience.”

- Marianne Belcari, Global Product Line Manager for CS Solutions.

Hybrid scan workflow



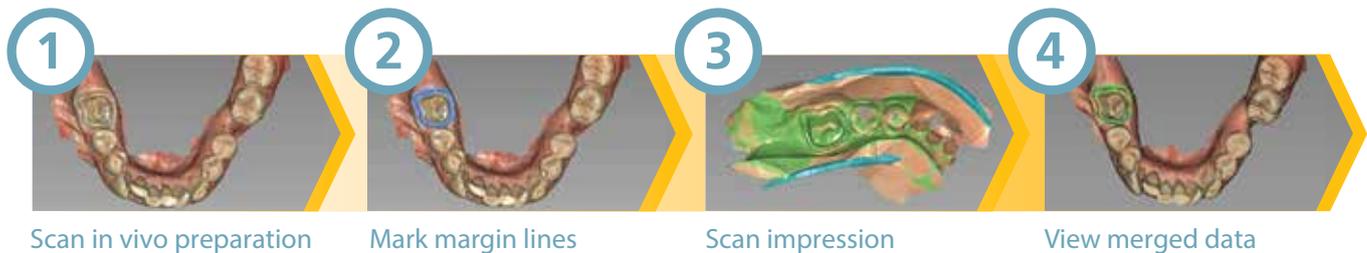
According to a recent study, "Intraoral scanners in dentistry: a review of the current literature,"² published by the scientific journal BMC Oral Health, a frequent challenge encountered with digital intraoral scanning is difficulty with detection of margin lines when blood is present or when the margin line is deep.

Additionally, when subgingival prosthetic margins are necessary for optimal case aesthetics, it can be difficult for intraoral scanners to correctly detect the margin line because light cannot physically detach the gingiva to register areas that are obscured by soft tissue as with conventional impression materials. While a retraction cord can be used, the gingival sulcus generally collapses quickly upon removal, requiring a fast and masterful scanning technique for successful margin line capture.

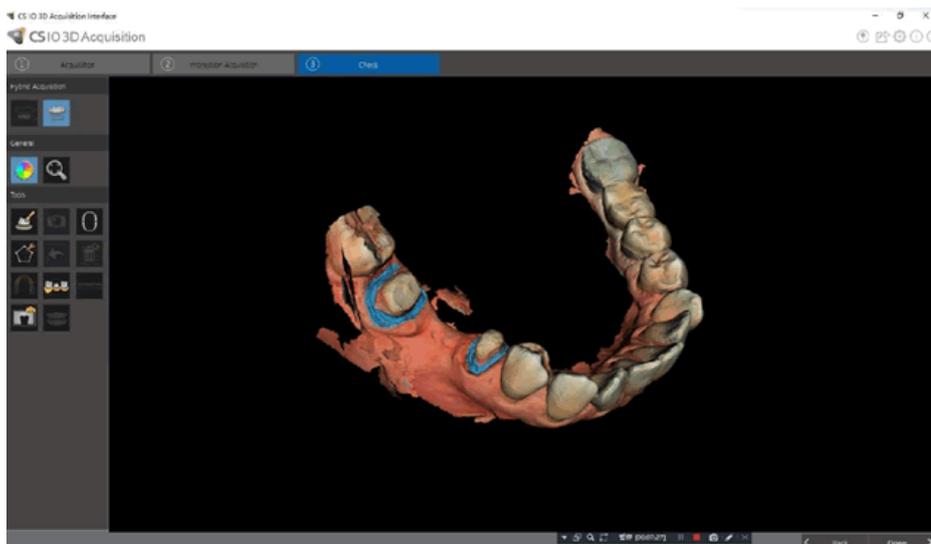
To help practitioners challenged by scanning deep margin lines or cases of excess bleeding, we have developed the new patent-pending Hybrid workflow. This patent-pending evolutionary workflow merges the scanned-in vivo data together with the scan data from a partial conventional impression into a single file. This significantly improves the quality of the capture of subgingival margin data for a more ideal design and fit of the final prosthetic.



Four-step hybrid scan workflow



A special brush tool has also been added to the toolbar to allow for the selection of the margin area. When the margin area is marked, the software will only merge the impression data at the selected margin area. The merged data set will be displayed and the merged data highlighted.



Completed Hybrid scan with merged data highlighted

Multiple bite capture

This feature allows for the capture of multiple bite registrations, which is often required for the design and manufacture of sleep apnea devices. Up to 3 different bite registrations can be obtained: for example, normal, open and protruded bites, allowing for the capture of up to 6 different views per bite registration. Expanded Extra Bite tools on the toolbar allow for the capture and view of the additional bites.



New Extra Bite Tools

Left, bite view 1. Right, bite view 2.

If 3 different bite relationships were recorded, 3 separate lower arch STL files will be produced. The bite matrix files can be exported and sent with the dataset to the lab or device manufacturer and viewed in the CAD software.

Bite mesh save

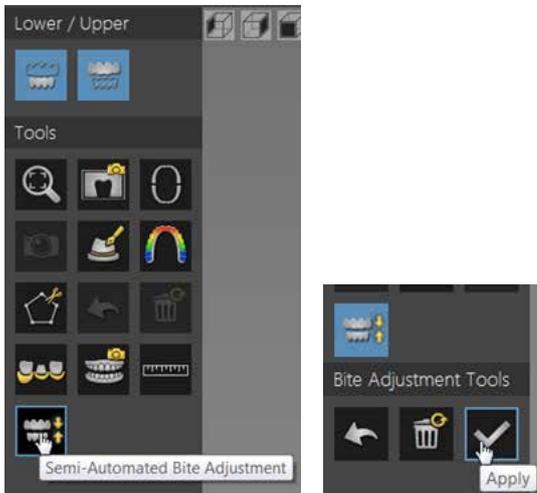
The software saves the 6 bite views in the DCM file and exported as one STL file for each bite relationship. If 3 bite relationships were recorded, 3 separate bite mesh STL files will be produced and can be exported. The bite mesh is often needed by the lab technician to readjust the bite after importing the scanned dataset into the CAD software. Providing this additional file improves the lab's experience when working with CS 3600 digital impressions.



Bite capture mesh

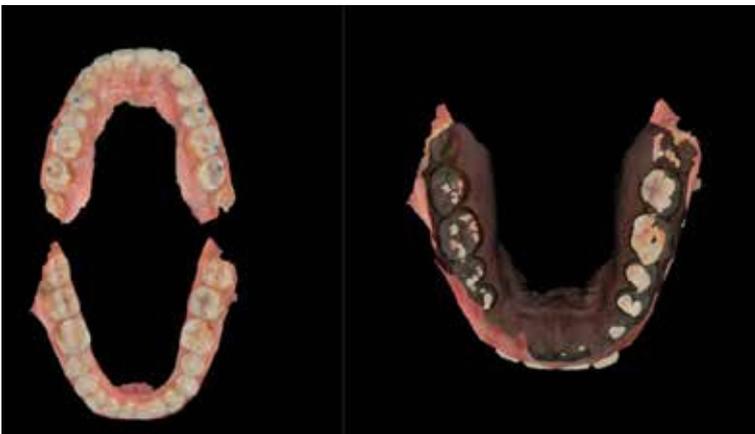
Semi-automated bite adjustment

This feature allows for the adjustment of the bite if the initial automated average bite does not result in the correct occlusion. The manual bite adjustment recalculates the bite based on selected contact points on the occlusal surface. This option is available in all workflows and can be accessed from the Check step option from the toolbar.



Left, Semi-Automated Bite Adjustment on toolbar. Right, expanded Bite Adjustment Tools.

The bite can be adjusted by selecting Manual Bite Adjustment from the toolbar, clicking on a series of points in the specific occlusal areas where the bite should be re-calculated, and then clicking Apply. The bite will automatically be re-calculated around the selected points and will adjust automatically.



Left, selected points on occlusal surface. Right, automatic bite re-calculation.

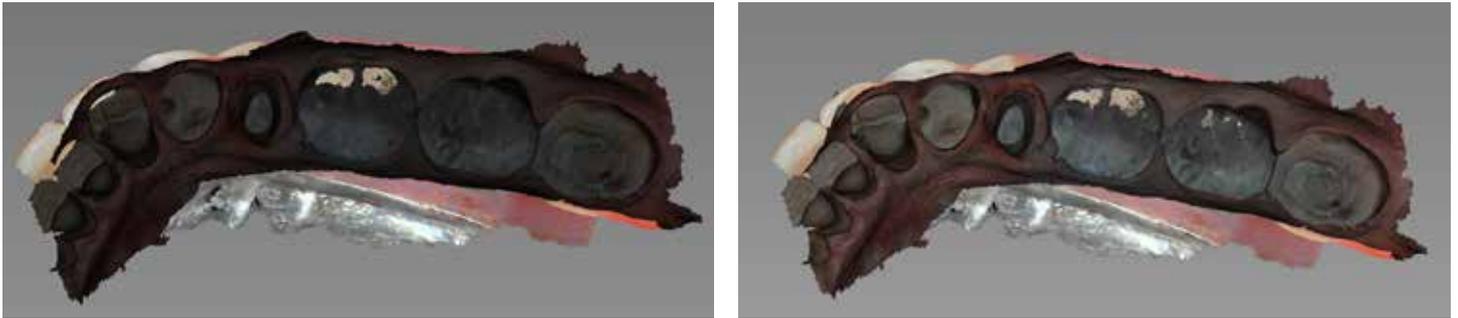


PRO TIP: “Use articulating paper before scanning to highlight the occlusal contacts. The contact points produced by the articulating paper will appear on the scanned image of the occlusal surface, and can be selected during the Manual Bite Adjustment process.”

- CS 3600 power user Dr. Pawel Paszkiewicz, owner of Centrum Estetique in Polanica Zdrój, Poland.

Improved lighting on underside of scan

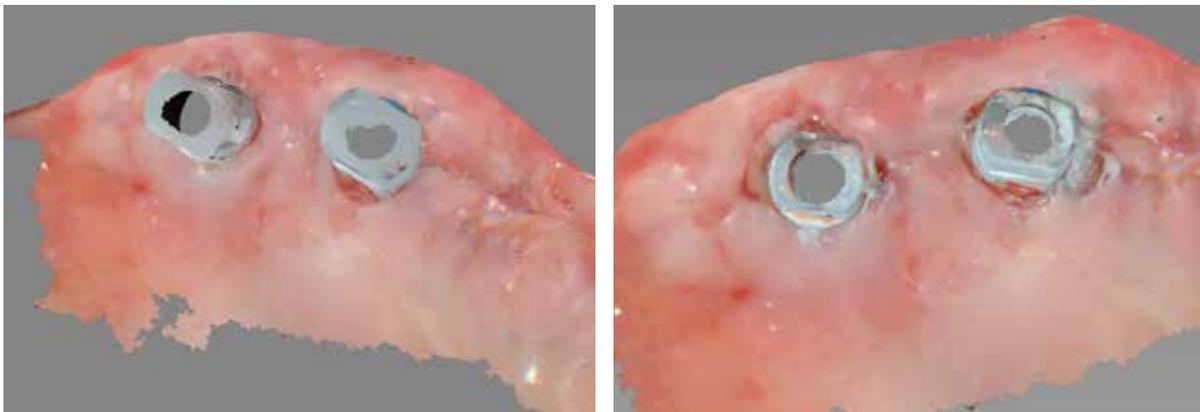
The software now provides better lighting on the underside of the scan for possible margin line identification or examination of other areas of interest from below the digital model.



Left, previous version showing dark underside. Right, new version with improved lighting.

HD color display improvement for scanbodies

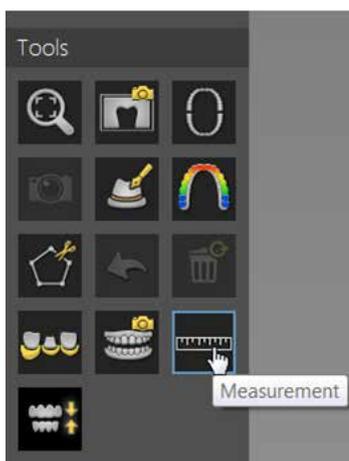
The color rendering of scanbodies is significantly improved when viewing in HD color.



Left, old color rendering. Right, new version with improved color rendering.

Measurement option available in all workflows

In previous versions of the software, the Measurement tool was only available in the Restorative mode. Because measurements are needed for all indications, the Measurement tool is now available in all workflows in version 3.1.0.

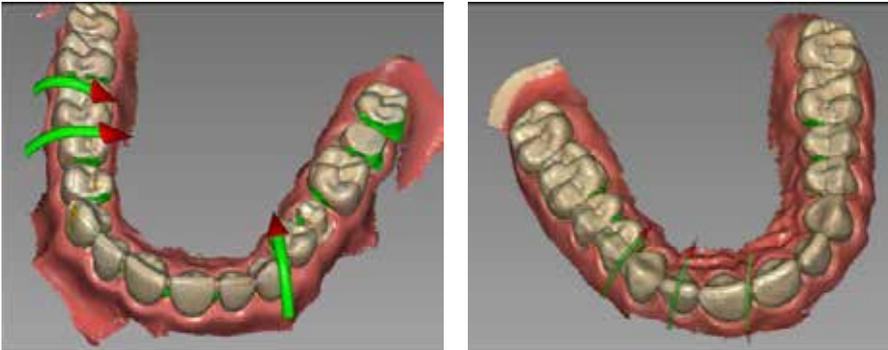


Measurement tool

Semi-transparent display of scan warnings

Green lines with red arrow scan warnings were introduced in version 3.0 to help indicate weak connections among buccal, lingual, and occlusal surfaces that might cause an image stitching area, especially on incisal edges.

In version 3.1.0, the arrow warning has been modified so it is now smaller and transparent, allowing for the viewing of the scanned impression beneath the arrow. Previously, the arrow was larger and opaque, often obscuring the view of the digital impression below.



Left, previous scan warning. Right, improved transparent scan warning.

Skip scan area selection when CS Restore is not used

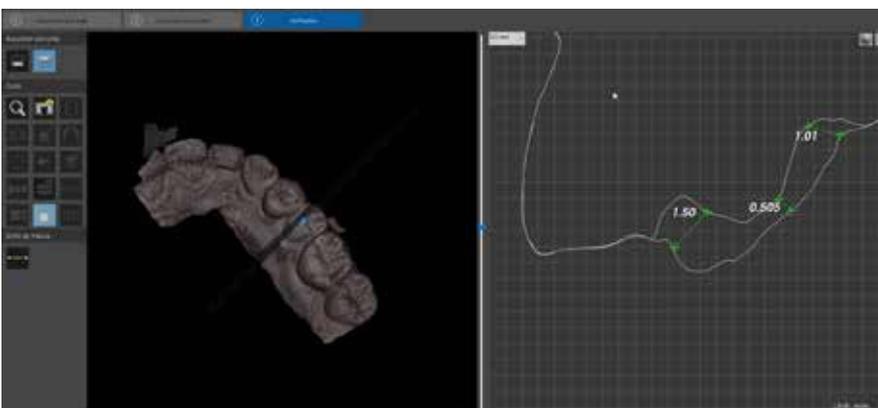
The software now allows the user to bypass the tooth number selection in the preparation Check step and directly refine the 3D model when the restoration is not being designed in CS Restore.



Skip scan selection

Preparation check

This feature allows for the superimposition of pre- and post-preparation scans to perform distance measurements to help verify that the preparation meets the restoration material requirements and check abrasion.



Preparation check showing merge of pre- and post-preparation scan



PRO TIP: “The more you zoom in on the preparation check, the more precise your selection will be.”

- Vincent Faure, Carestream Dental CS Solutions Regional Product Line Manager for EMEA Region

Updated Preferences interface with additional options

The Preferences options have been redesigned to have the same appearance and functionality as the Preferences in the new Carestream Dental CS Imaging software version 8. This will help provide more continuity among our software for a more consistent experience.

Several of the General default preferences settings have been reassigned to new Preferences options. Additionally, new options have been added to the Preferences as follows:

- **Scanning sound option:** Allows for the playing of sound through the computer while scanning.
- **Scanning area selection option:** Allows for the bypassing of the scan area selection.
- **Bite adjustment option:** Disables or enables the automatic bite adjustment option.
- **Display scan warning option:** Displays or hides the green arrow scan warning.
- **Manual bite option:** Allows for the manual capture of the bite views by pressing the power button.
- **Bite save option:** Saves the bite meshes in the DCM file.

Preferences > General

The software now allows for the establishment of General default settings, such as language and background color. In previous versions, the General preferences offered both a Basic and Advanced tab. The options offered in the Advanced tab have been relocated to their own Preferences option: Preferences > Scan.

Preferences > Scanner

The Scanner Preferences now offers multiple audible scan options. In addition to the beeping sound offered previously, a PC sound can be selected from the list of sound effects.



New Scanner Preferences

The scanning sound options include:

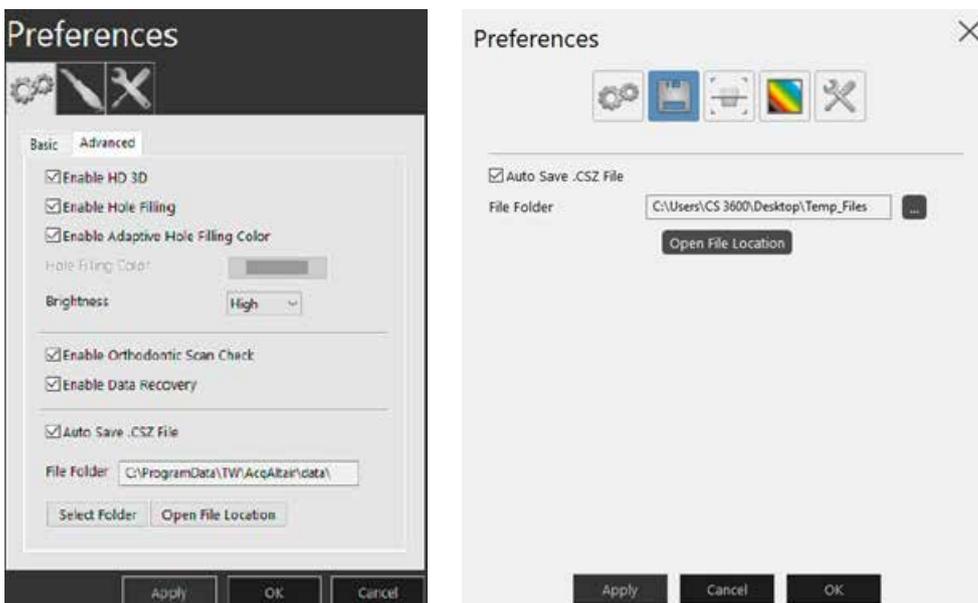
- No sound
- Scanner beep
- PC sound/sound effect (NEW)
- Sound volume control (NEW)

IMPORTANT NOTE:

The PC sound option requires the computer to be equipped with functional speakers.

Preferences > Save

Previously, the Save options were located in the General preferences. All Save default settings have been relocated to the Save Preferences.



Left, Save options previously in General Preferences. Right, new dedicated Save options.

Preferences > Scan

The Scan Preferences allow for the selection of scanning default settings.



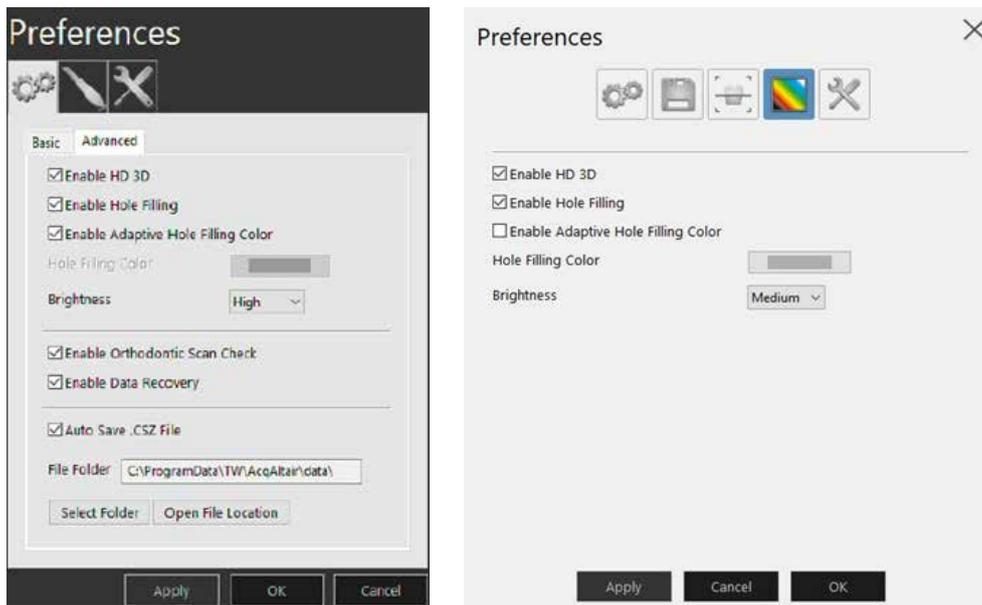
Scan Preferences

Options include the enable and disable of:

- Scan warnings
- Data recovery
- Scanning area selection check (NEW)
- Bite adjustment (NEW)
- Multiple bite capture (NEW)
- Bite output (NEW)
- Semi-automated bite adjustment (NEW)

Preferences > Color

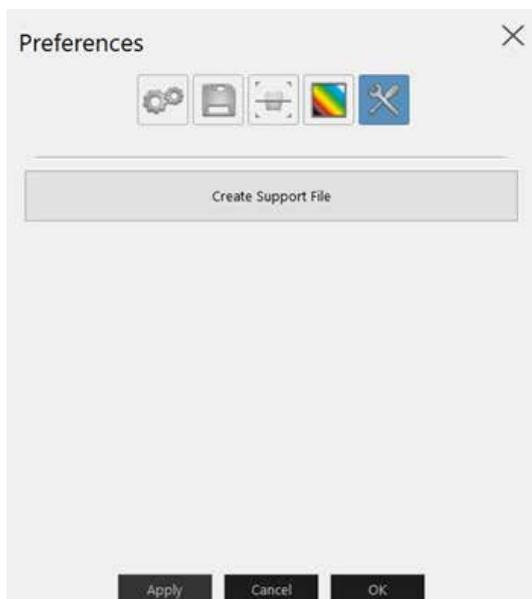
In previous versions of the acquisition software, the Color Preferences were located on the Advanced tab of the General Preferences. Now, the Color preferences have dedicated default settings.



Left, previous versions. Right, new Color Preferences settings.

Preferences > Tools

The appearance of the Tools preferences has been modified slightly. However, it is still used to create the support file when needed.

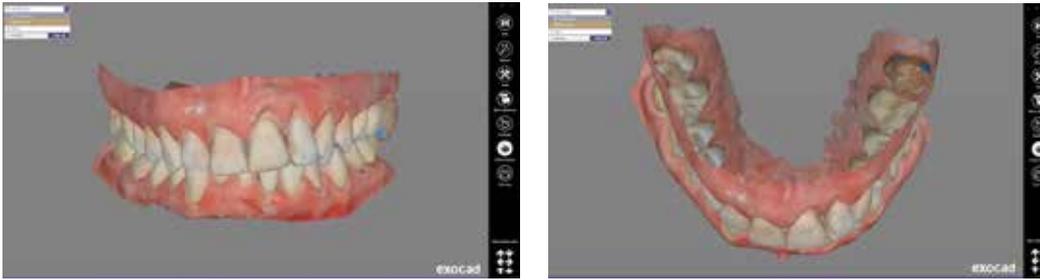


Tools Preferences

MORE CS 3600 NEWS

Improved color rendering in Exocad⁴ software

The color rendering of datasets acquired with the CS 3600 has greatly improved in Exocad software.



Color improvement in Exocad software

An expanding list of global validated partners

Carestream Dental has been actively engaging with leading companies in the dental industry to provide the best digital solutions for orthodontics, restorative and implant treatments, guided surgery and sleep medicine workflows. The following companies have validated workflows with the CS 3600 intraoral scanner. A local representative can clarify whether a partner is accredited to work in a particular country or region.

| Orthodontic Appliances and Treatment | Restorative and Implant Workflows | Guided Surgery Workflows | Sleep Dentistry Appliances |
|--------------------------------------|---------------------------------------|------------------------------|--------------------------------|
| CA Digital | 3Shape* | 360 Imaging | Panthera |
| Cfast | Amann Girrbach – Ceramill Mind* | 3DDX | Prosomnus Sleep Technologies** |
| ClearCorrect | Anthrogyr | 3Shape – Implant Studio* | |
| e-aligner | DentalWings – DWOS and DWOS Chairside | Blue Sky Bio – Blue Skyplan* | |
| EON Aligners | Dentsply Atlantis | Dentsply – Simplant | |
| exceed | exocad | MIS – MGUIDE | |
| Harmony – American Ortho | Glidewell | Modjaw | |
| Ideal Smile Aligner – GAC | Global D | Nobel Biocare NobelClinician | |
| Incognito – 3M | Jensen – Preciso CAD* | Straumann – CoDiagnostiX* | |
| Insignia – Ormco | MIS | SwissMeda – SMOP | |
| Modjaw | Modjaw | | |
| OnyxCeph | Nobel Biocare - NobelProcera | | |
| Orchestrate 3D | Sweden & Martina | | |
| Orthocaps | Ziacom – Zinic 3D | | |
| Nutislab | Zirkon Zahn – Modellier* | | |
| Rx Aligners | | | |
| S4S | | | |
| Suresmile | | | |
| ZeroBase | | | |
| 6 Month Smiles | | | |

*Data sets captured by the CS 3600 are compatible with 3shape, Amann Girrbach -Ceramill Mind, Jensen - Preciso CAD, and Zirkon Zahn – Modellier software.

**Scans are currently accepted but is pending final formal validation

Proven accuracy - again

Since its launch in 2016, the accuracy of Carestream Dental's CS 3600 intraoral scanner has been consistently confirmed by international third-party scientific research, making it a scanner users can be proud to own.

In February, the CS 3600 was again recognized for its outstanding performance in finish line accuracy in a study aimed at highlighting differences among seven intraoral scanners and one traditional impression, "Finish Line Distinctness and Accuracy in 7 Intraoral Scanners versus Conventional Impression: An In-vitro Descriptive Comparison,"³ published in BMC Oral Health.

Based on "color deviation evaluation and distribution of deviations in histogram," the CS 3600 shared the top rank among the scanners for highest finish line accuracy, with a deviation below $\pm 25 \mu\text{m}$. The study also stated the CS 3600 showed a clear and distinct color rendering, which the researchers purposed may "assist in identifying the finish line compared to the monochromatic STL files."

Also, while the CS 3600 consistently ranked higher in both finish line accuracy and distinctness than the traditional impression, that was not true for all scanners tested.



"In modern dentistry, we assume that digital will naturally give us better results than analog. However, this study shows that not all scanners are created equal when it comes to providing better results than traditional impressions."

- Ed Shellard, D.M.D. and chief dental officer of Carestream Dental

An award-winning solution

The list of accolades continues to grow! In just two years, the CS 3600 has been recognized as being a top new and innovative dental product by multiple dental publications and organizations. The latest additions include the Dental Product Shopper Best Product classification, with the CS 3600 scanner receiving an overall evaluation score of 4.6 out of 5.

The CS 3600 was once again recognized as a Top 100 Product by Dentistry Today for 2018.



NEW



NEW



NEW

Recognized by Clinicians Report as Best Product of 2016

Received a rating of "Excellent-Good" by Gordon J. Christensen Clinicians Report

Additionally, the CS 3600 was recently heralded as “a market disruptive product and a fantastic advancement for sport” and was recognized as the “Most Innovative Sports Equipment or Apparel” and at the [Yahoo! Sports Technology Awards](#).



CS 3600 recognized at Yahoo! Sports Technology Awards

The scanner was recognized for its role in creating open, digital impression files that enabled the fabrication of mouthguards for the 2017 Varsity Match between the University of Oxford and the University of Cambridge. The innovative digital technology behind the scanner allowed for quick and easy scanning of 120 team members without the need for traditional impression materials.

The collaboration was made possible through key digital partnerships: Carestream Dental CAD/CAM specialist David Claridge coordinated scanning of the 120 players; the open STL files were sent to Fairbanks Dental Laboratories for printing; and Rhino Mouthguards by Forecotech Mouthwear produced the finished mouthguards.



Rhino mouthguards manufactured from CS 3600 scans.

Tips autoclavable up to 60 cycles

All three removable scanner tips are now autoclavable up to 60 cycles if the exposure is limited at 134°C to not more than 4 minutes. The CS 3600 Family Safety, Regulatory and Technical Specifications User Guide provides additional details.

Posterior tips now available

The posterior tips are now available as an optional accessory. The new posterior tip offers the following advantages:

- Features the shortest autoclavable tip height in the market
- Provides access to difficult-to-reach areas for improved clinical outcomes
- Improves patient comfort during the acquisition process
- Is ideal for posterior scans, as short tip height improves access to the distal molar region



Left, standard tip. Right, new posterior tip.

¹Internal test conducted using automated testing tool which simulated the 3D mesh construction and display process. Scan speed improvement is between 13-22% and varies by system configuration. Speed improvement does not factor in scanning skills.

²Mangano FG, Gandolfi A, Luongo G, Logozzo S. December 12, 2017. Intraoral scanners in dentistry: a review of the current literature. BMC Oral Health, (2017) 17:149DOI 10.1186/s12903-017-0442-x

³Nedelcu R, Nystrom I, Olsson P, Thor A. Feb. 26, 2018. Finish Line Distinctness and Accuracy in 7 Intraoral Scanners versus Conventional Impression: An In-vitro Descriptive Comparison. BMC Oral Health.18(27): DOI 10.1186/s12903-018-0489-3

⁴exocad is a registered trademark of exocad GmbH