2024-05-07 - HP Carbon 1.12.10

Here you can find information about what is new in HP Carbon version 1.12.10.

This version is available for **download** from the Octonus official web site.

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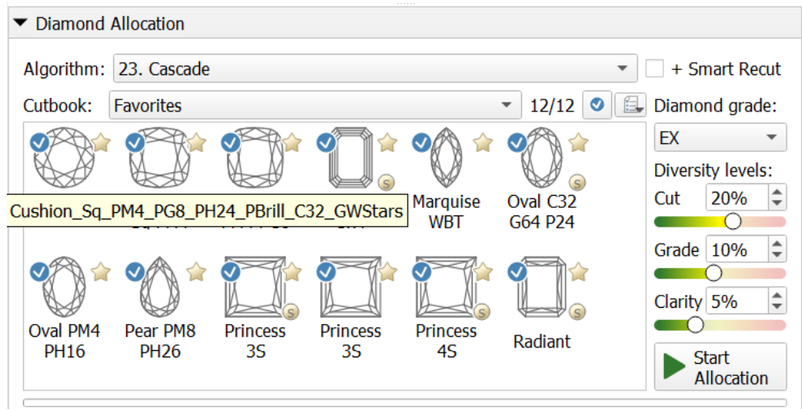
Algorithms of allocation

Algorithm 23. Cascade

The new algorithm 23. Cascade is available since version 1.12.10, designed for finding solutions comprising two diamonds, offers several advantages over its predecessor, the 13. Cascade-2M algorithm.

- In the search for solutions exclusively featuring the RBC cut on a large stone dataset, it operates at a speed 1.6 times faster than Cascade-2M, delivering approximately 1% more expensive solutions.
- In simultaneous execution across 10 distinct cuts, the new algorithm demonstrates a remarkable 4.5 times speed improvement and yields solutions priced approximately 1.4% higher.
- Due to a more efficient utilization of memory, the 23. Cascade algorithm can effectively handle complex diamond models with several tens of thousands of inclusions, a capability beyond the reach of 13. Cascade-2M.



Allocation - option "+ Brilliance based"

While new global allocation algorithms prioritize finding the most price-effective solution based on a given price list, it's important to recognize that user requirements are diverse.

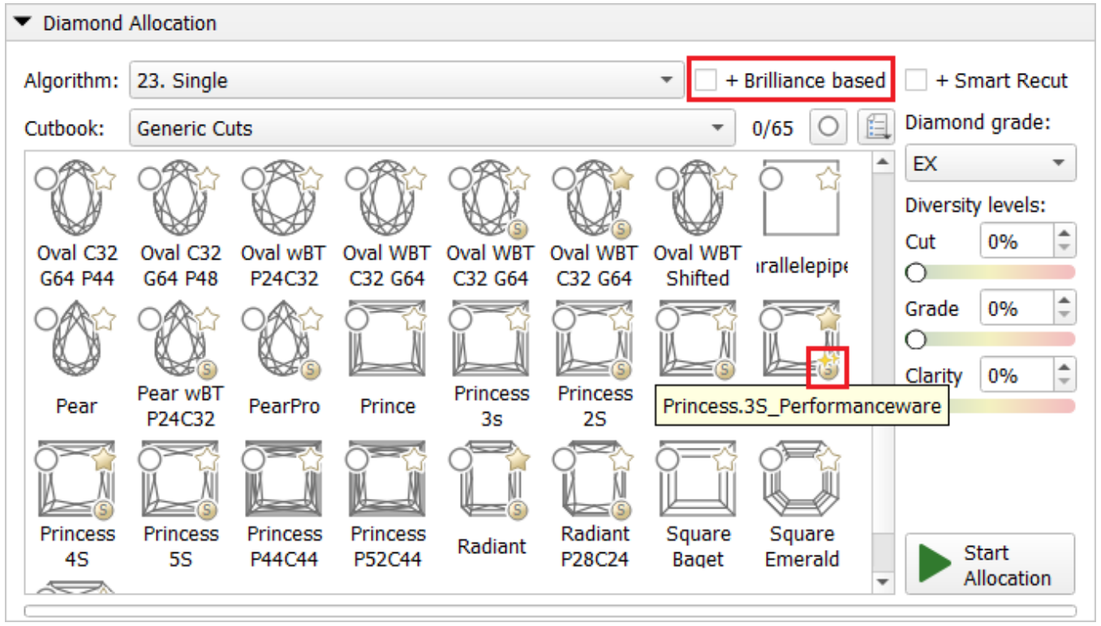
The value of a particular diamond to a company depends on various factors beyond its carat price alone, including:

1. The current liquidity of similar diamonds and fashion trends.
2. The diamond performance.
3. The specific preferences of the individual buyer.

4. Some customers rely on external price lists for evaluation, which are inaccessible to the algorithms.

Let's focus on the "diamond performance," specifically the Brilliance characteristic.

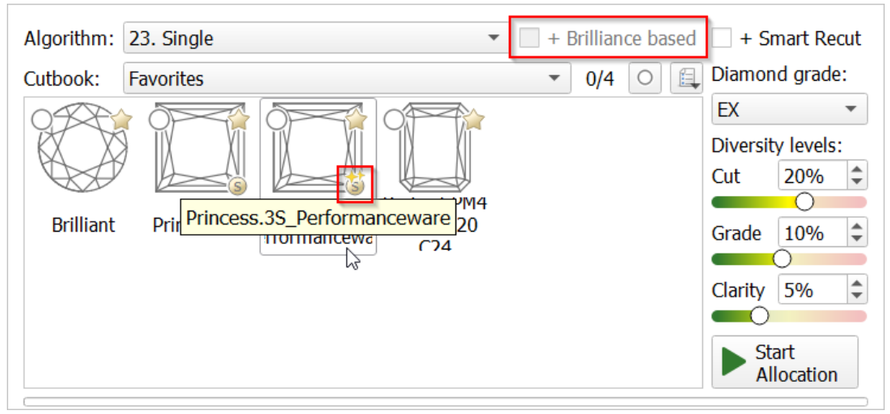
The program now includes Brilliance Based Cuts, which utilize a GRID-appraiser built based on the Brilliance characteristic. The preforms for these cuts undergo quality control that excludes low Brilliance and have assigned Brilliance values in the program. Modern algorithms can utilize these values.



The "+ Brilliance Based" option is available in the "23. FixedForm" and "23. Single" algorithms. It allows users to obtain a range of solutions from optimal mass to optimal Brilliance. The SmartRecut algorithm is automatically launched with a single preset for all these solutions. Brilliance Based solutions are marked with shine icons in the label field. The "+ Brilliance Based" option only affects Brilliance Based Cuts

☑	Imported model			3.9230								
☐	1		Princess....	4465$	1.2319		31.35%	VS2	H	VG	VG	EX	Max_Mass
☐	2		Princess....	4758$	1.2144		30.84%	VS2	H	EX	EX	EX	Max_Mass
☐	3		Princess....	4719$	1.2072		30.59%	VS2	H	EX	EX	EX	Max_Mass
☐	4		Princess....	3803$	1.1772		29.82%	VS2	H	EX	EX	EX	Max_Mass
☐	5		Princess....	4758$	1.2154	SR	30.84%	VS2	H	EX	EX	EX	Max_Mass
☐	6		Princess....	4876$	1.2401	SR	31.61%	VS2	H	EX	EX	EX	Max_Mass
☐	7		Princess....	4798$	1.2185	SR	31.10%	VS2	H	EX	EX	EX	Max_Mass
☐	8		Princess....	4837$	1.2318	SR	31.35%	VS2	H	EX	EX	EX	Max_Mass
☐	9		Princess....	4876$	1.2483	SR	31.61%	VS2	H	EX	EX	EX	Max_Mass

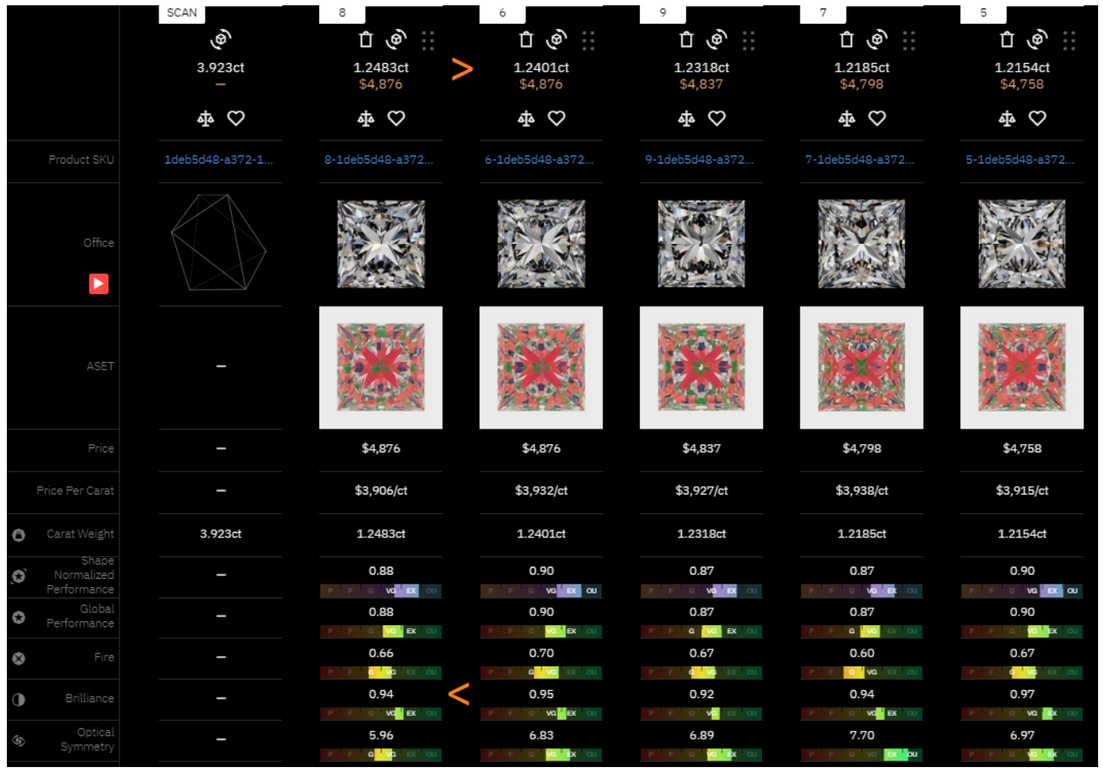
The option “+ Brilliance based” is disabled if no such cut is selected. **Note!** The only cut that currently supports this option is Princess.3S_Performanceware.



To ensure the algorithms can select Brilliance Based solutions, they need to calculate them in addition to the standard solutions. This may take a bit longer, but the additional processing time is insignificant compared to the overall duration.

When searching solutions with high Brilliance, the algorithms consider the Brilliance of the preform. Notably, the "23. Single" algorithm modifies the initial preform. The SmartRecut algorithm also modifies the initial preform in both cases, including "23. FixedForm." Consequently, the algorithms can only provide an approximate estimation of the final Brilliance. We assume that solutions obtained from preforms with high Brilliance have a higher probability of achieving high Brilliance in the end.

To evaluate and compare the optical properties of the final solutions, you can use CutWise.



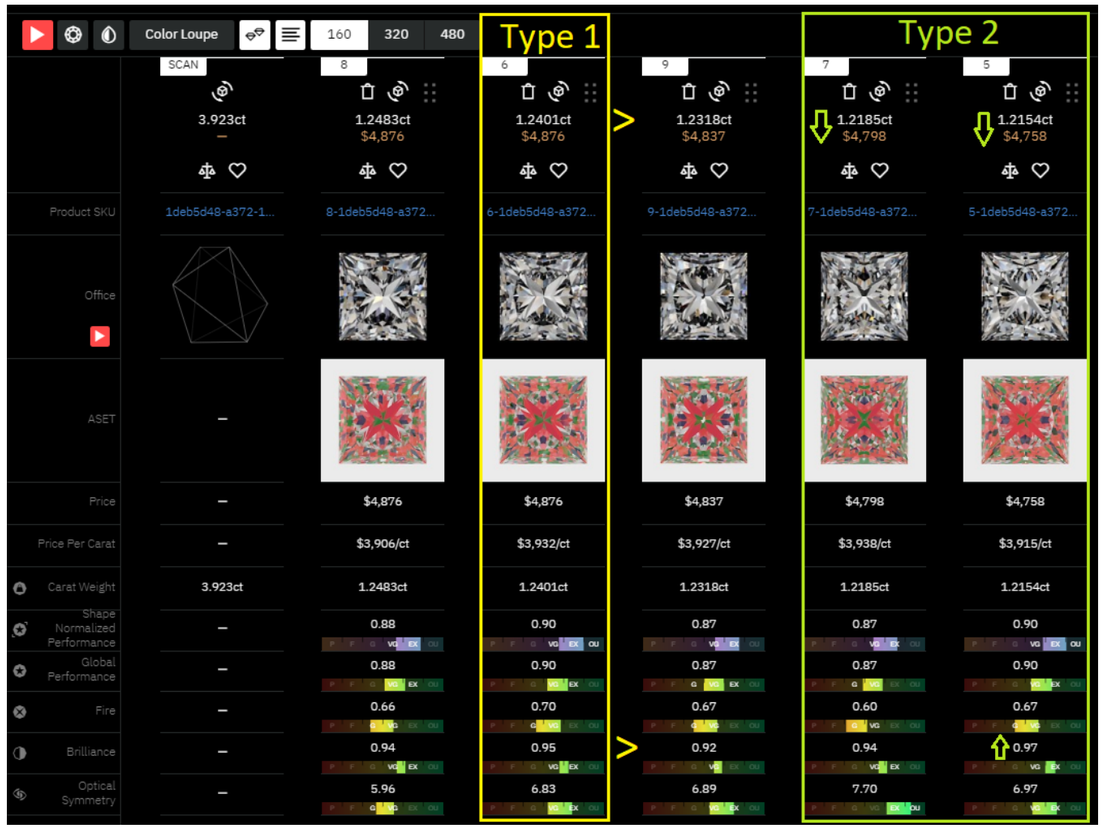
There are two types of Brilliance Based solutions:

1) At the final stages of the regular algorithm, when the approximate local position of the diamond is known, the algorithm calculates additional preforms. These preforms are slightly smaller than the optimal ones in that specific position, but they have significantly better Brilliance.

Solutions obtained through this approach, after SmartRecut, can have nearly identical mass compared to the best solution or even exceed it. However, they have a significantly higher probability of achieving greater Brilliance.

2) For the combination of Cut+Grade+Clarity that has reached a sufficient price to be included in the solutions list, an additional variation of the FixedForm algorithm is launched, which uses only elite preforms.

As a result, two solutions are obtained - the solution based on the preform with the highest Brilliance and the solution with the best mass among the elite unmodified forms. These solutions do not undergo any parameter modifications until SmartRecut, which ensures their higher and more reliable Brilliance. However, their mass may be noticeably lower in the "23. Single" algorithm.



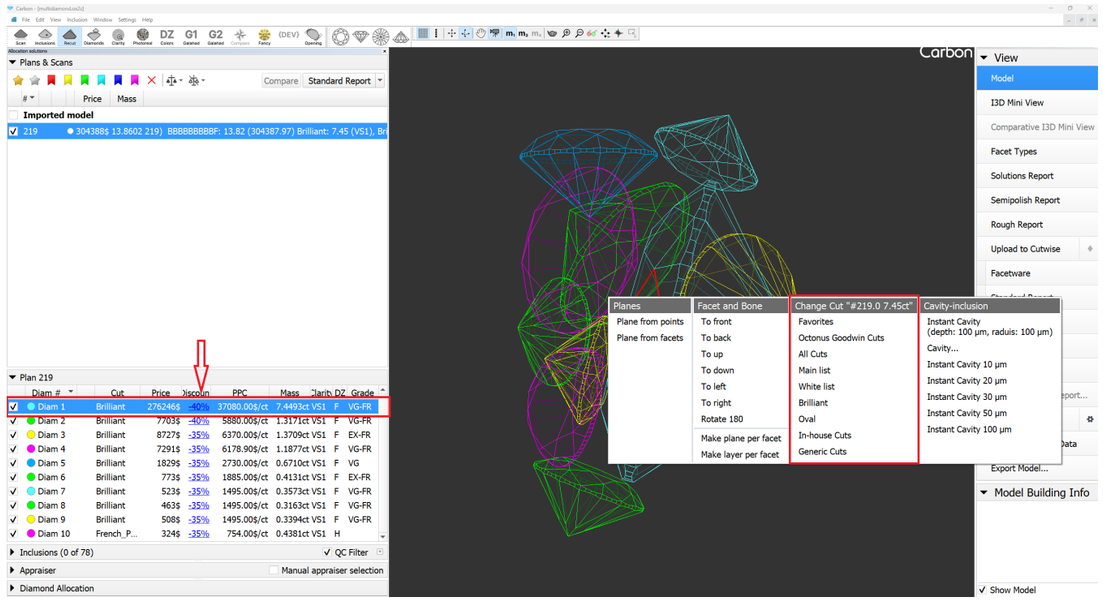
There is video explaining principles and main ideas of applying option "+ brilliance based" for cut Princess.3S_Performanceware:

Video | Performance based appraisers: Performanceware				
Published:	2024, February 16	**Last Updated:**	2024, February 16	**v.1.3**

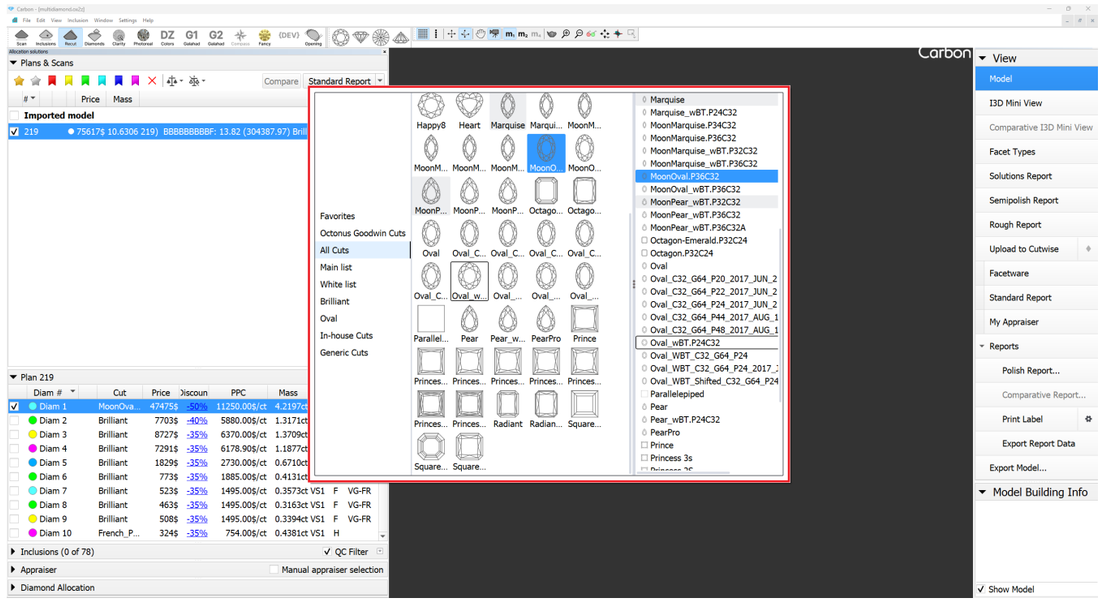
Published in:	**Release Notes**	2024-05-07 - HP Carbon 1.12.10
	Documentation	NA
	Playlists	NA
	Also	As Separate Page | On YouTube | Specification

Improvements for algorithm of manual allocation "Change Cut To..."

The "Change Cut To" menu is now available from the scene's context menu.



- Cutbook has been remastered for that command menu item and opens much faster now.
- It now features two synchronized lists with a segment for selection tabs, ensuring that the full names of the cuts are clearly visible.
- The positions of the splitter and scroll bars are remembered within the running program.
- The current cut is highlighted in dark blue, the used ones in light gray, and the one under the cursor is bordered.



Smart Cuts. Updates

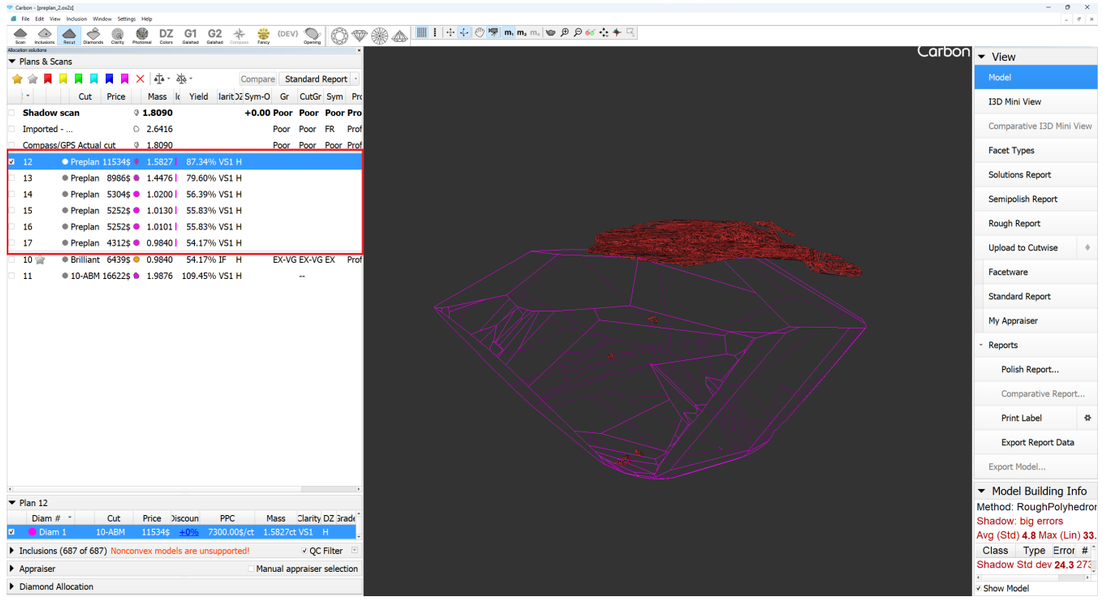
Princess.3S.Performanceware cut

Cut Princess.3S_Performanceware is implemented on the base of cut Princess.3S. This is the first cut that works with the "Brilliance based" technology, see above.

Seamless Technological Pipeline. Preplan concept.

Preplans segment

Preplans are separated into a single section in the solutions list. The 'Cut' column will indicate 'Preplan' for them.



Reports improvements

Interactive features of the Remaining Depth chart

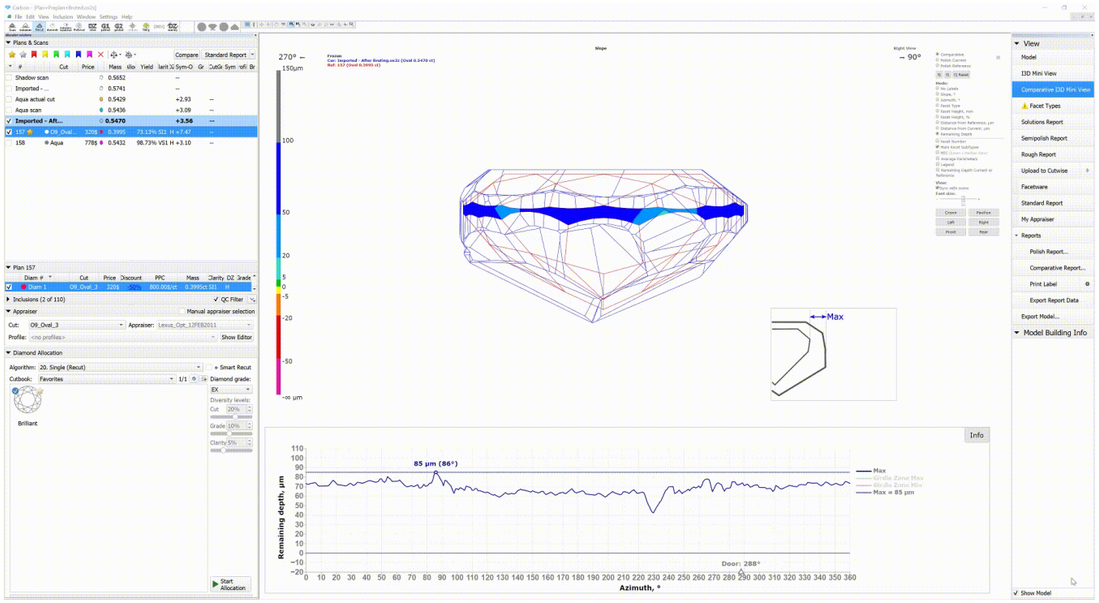
In the I3D Report, implemented interactive features within the Remaining Depth chart.

Users can now easily toggle the visibility of associated lines and marks by clicking on the respective legend items. Selections are saved and persist across program relaunches, providing a seamless experience.

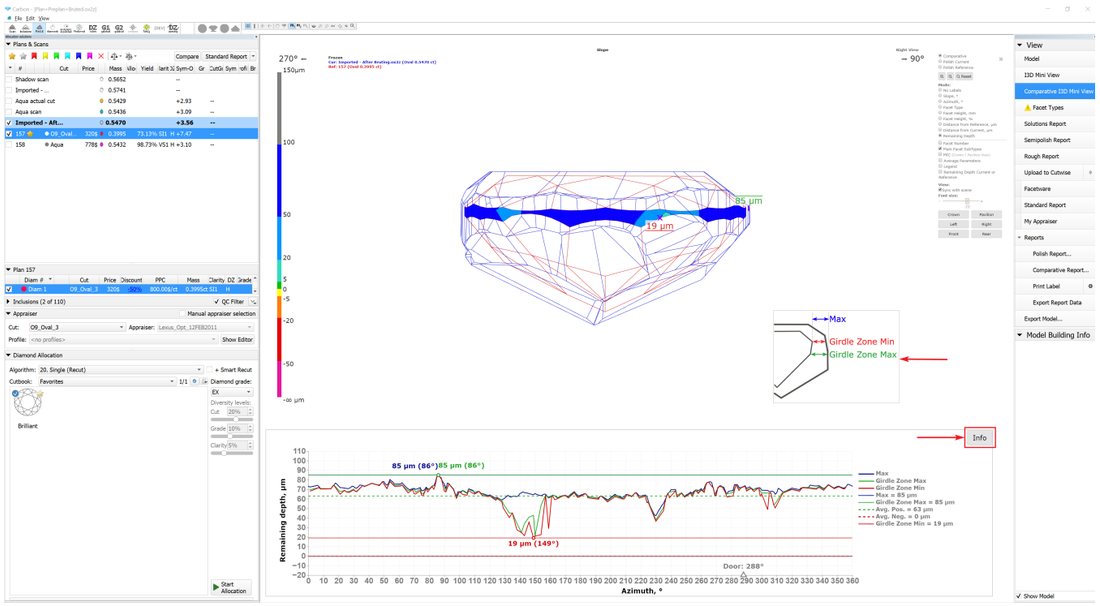
This update introduces a more intuitive and dynamic interaction, allowing users to focus on specific lines of data that are of interest.

By default, only the Max Line (Blue) is enabled, while Girdle Zone Min and Max are disabled.

Sample: Plan+Preplan+Bruted.ox2z

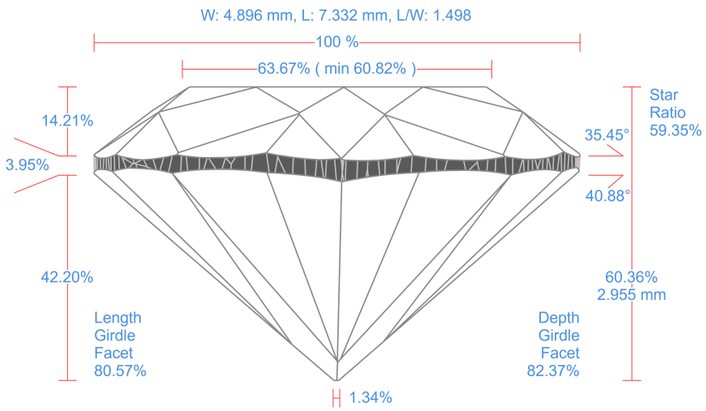


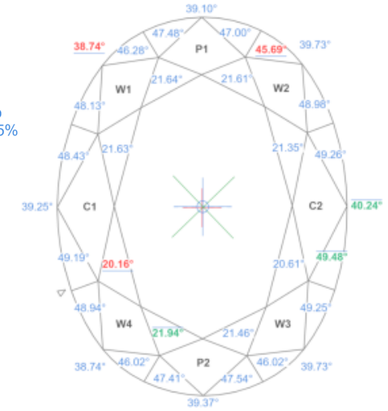
Introduced an "Info" button to display an image containing graphical explanations of distances on the chart. The image updates based on the selection made in the legend items.

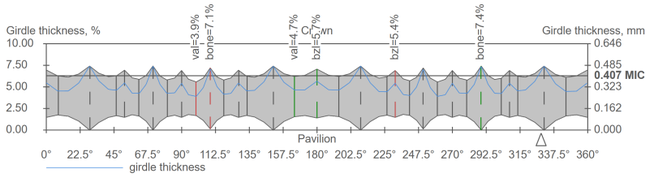


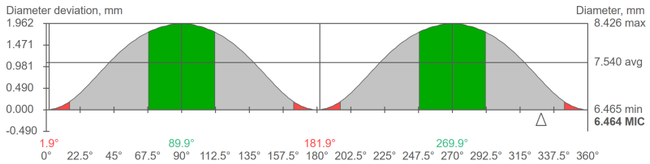
Export SVG images

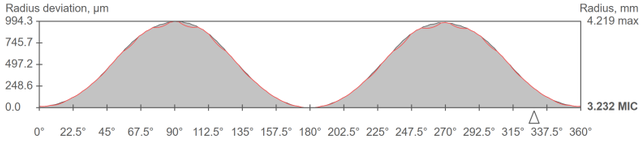
In Export Report Data, the capability to export images in the SVG (Scalable Vector Graphics) format has been introduced. This format offers high-quality vector images that can be scaled to any size without loss of quality.

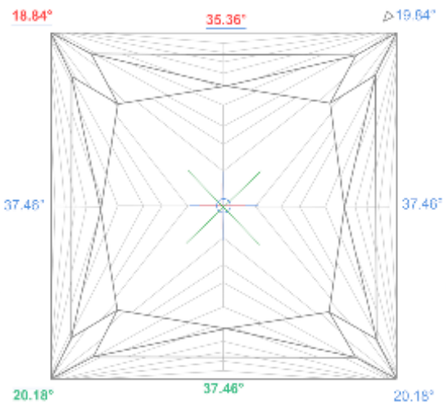


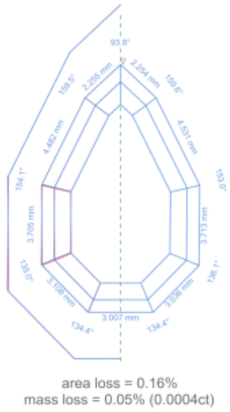




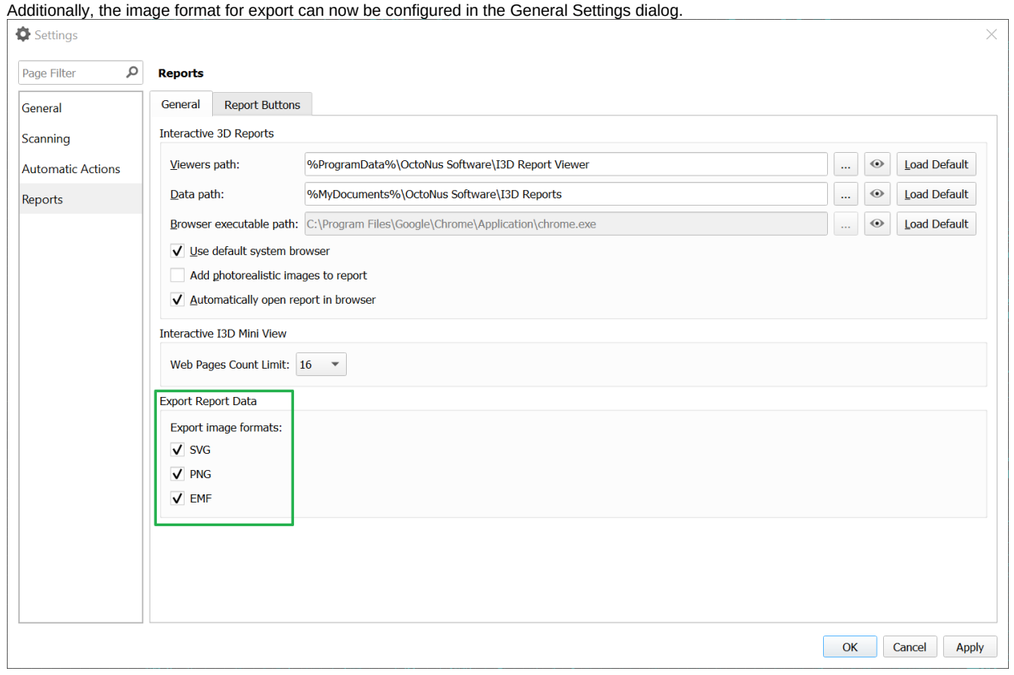








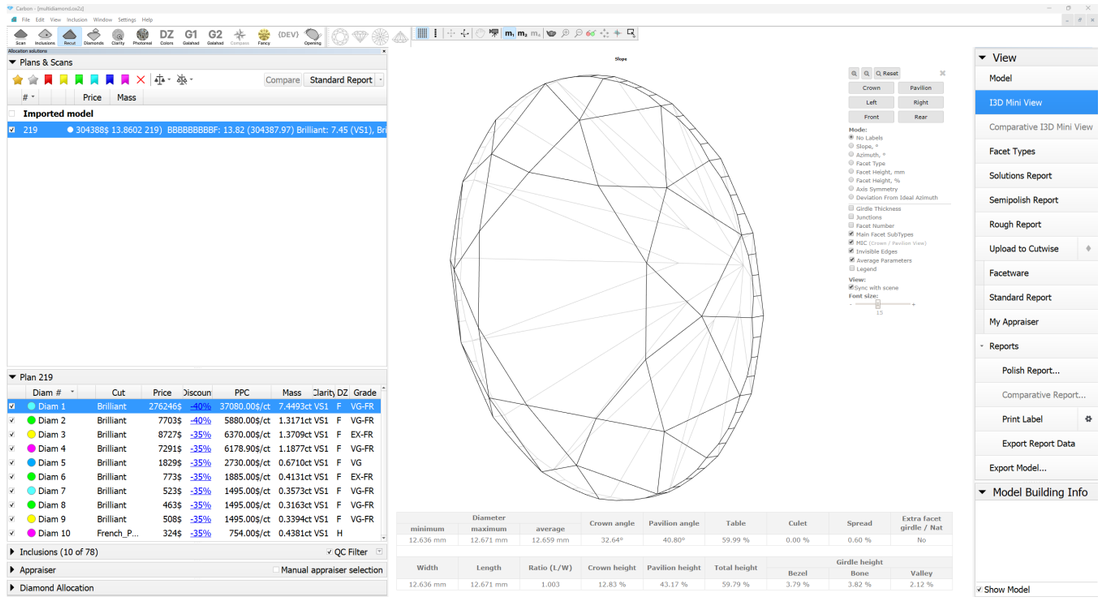
Additionally, the image format for export can now be configured in the General Settings dialog.



I3D Mini View / I3D Report UX/UI improvements

In the I3D Mini View / Report, the quality of UX/UI has been improved, specifically:

- the zoom works without modifiers, just with the mouse wheel, and the strength factor of zoom buttons has increased
- navigation buttons have been moved up for quick access
- the empty space between the scene and the table has been eliminated



Quality Control improvements and news

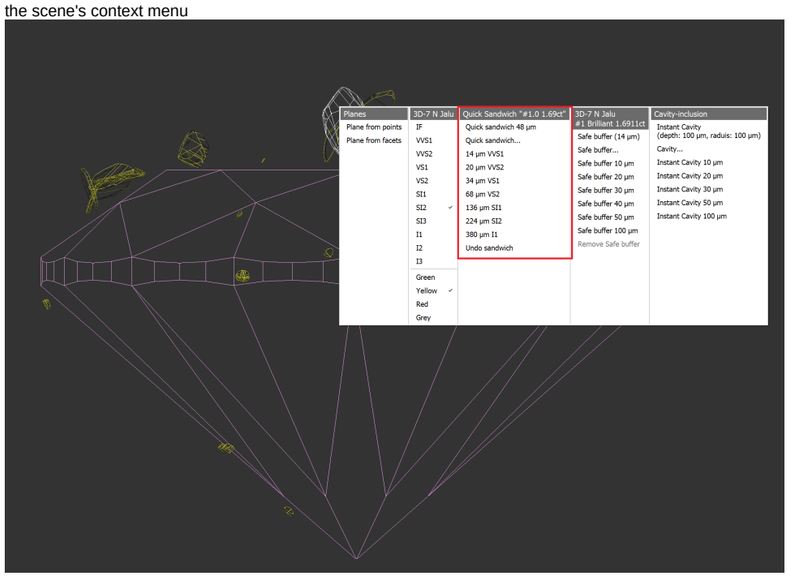
Quick sandwich tool

A quick sandwich tool has been added, which makes it possible to separate a smaller peace of inclusion. This may increase plan weight with the same clarity.
Please look at the video with demo of tool advantages and settings:

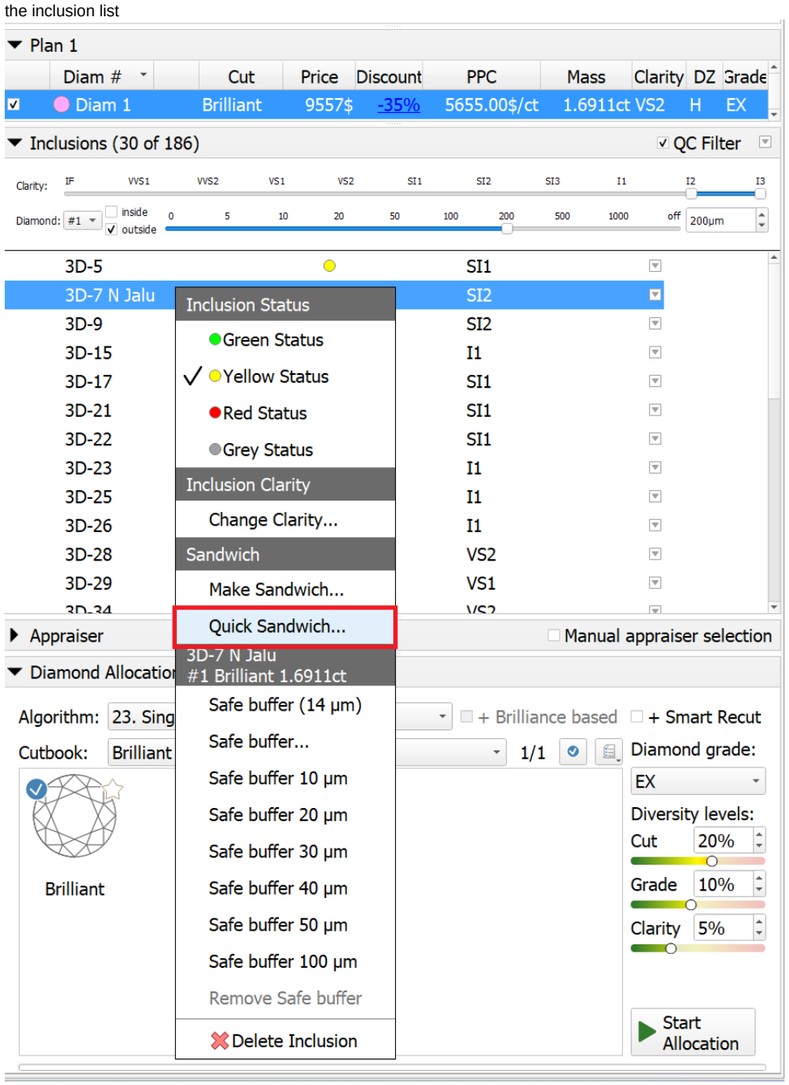
Video | Quick Sandwich - Tool to separate part of inclusion				
Published:	2024, February 16	**Last Updated:**	2024, June 5	**v.4.8**
Your browser does not support the HTML5 video element				
Video summary: • Splitting inclusions into parts, known as "sandwich", may increase plan weight with the same clarity. • The quick sandwich cuts a small part from the inclusion with parallel to the diamond plane. There are preset offset values with the expected clarity of the separated part. • This tool gives you an opportunity to significantly improve the solution.				
Video keywords: sandwich, inclusion, separation tool				
Data	raw_diamond_sample.ox2z			
Published in:	**Release Notes**	2024-05-07 - HP Carbon 1.12.10		
	Documentation	NA		
	Playlists	NA		
	Also	As Separate Page | On YouTube | Specification		

The quick sandwich tool is available in two places:

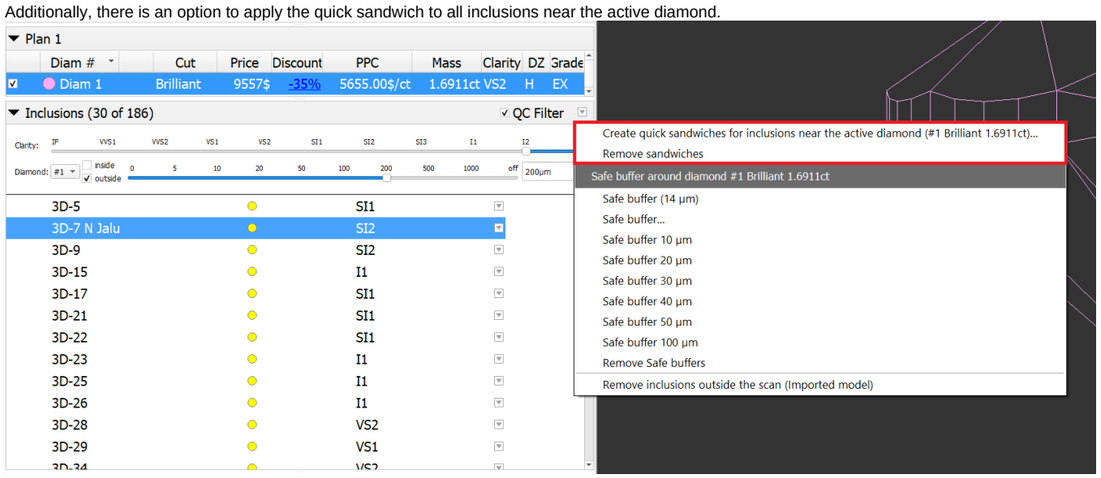
- the scene's context menu



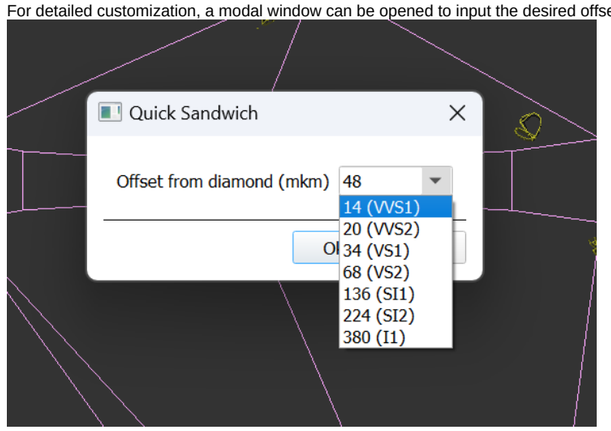
- the inclusion list



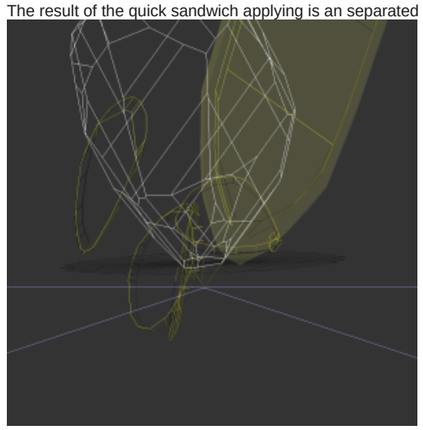
Additionally, there is an option to apply the quick sandwich to all inclusions near the active diamond.



For detailed customization, a modal window can be opened to input the desired offset.

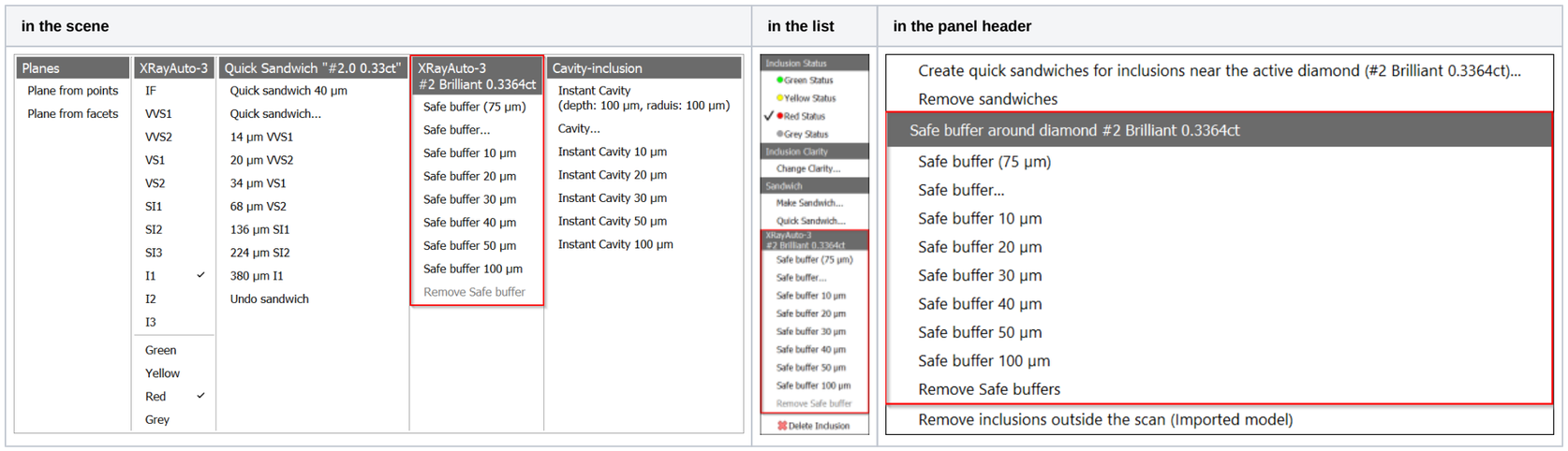


The result of the quick sandwich applying is an separated inclusion with parallel to the diamond plane.



Quality Control (QC). Safe buffer of inclusions

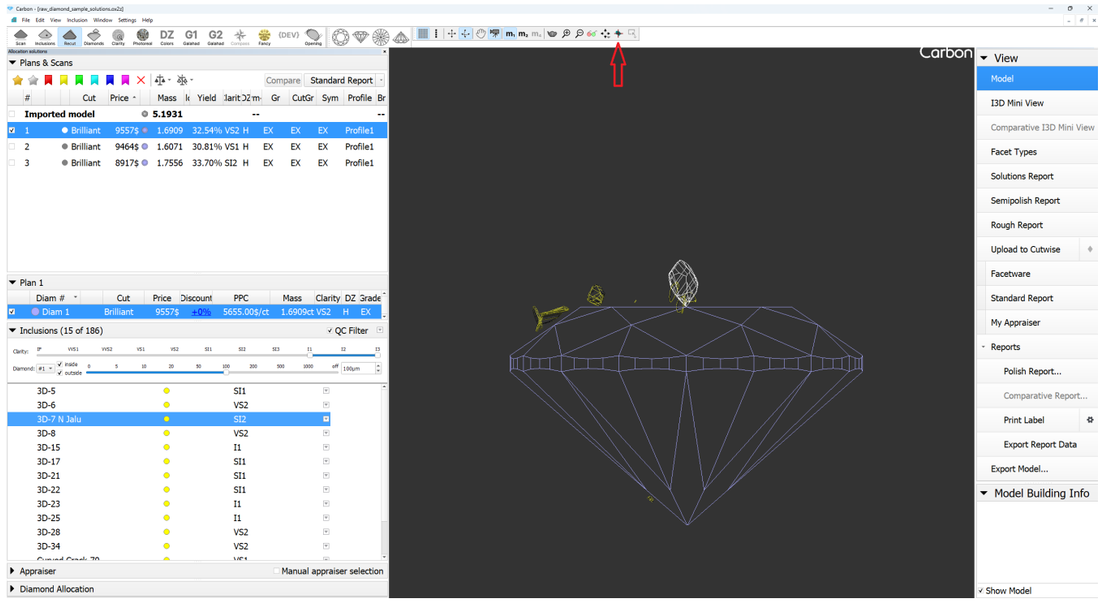
- Added context menu to scene.
- Unified Safe buffer elements in all menus (in the scene, list, and panel header).



User interface updates

Inclusion selection tool

Now the selection with inclusion can be removed.
For that purposes, you need to click on an empty space in the scene with the inclusion selection tool active.
Also, for convenience, you can use the SHIFT modifier instead of the tool on the panel.

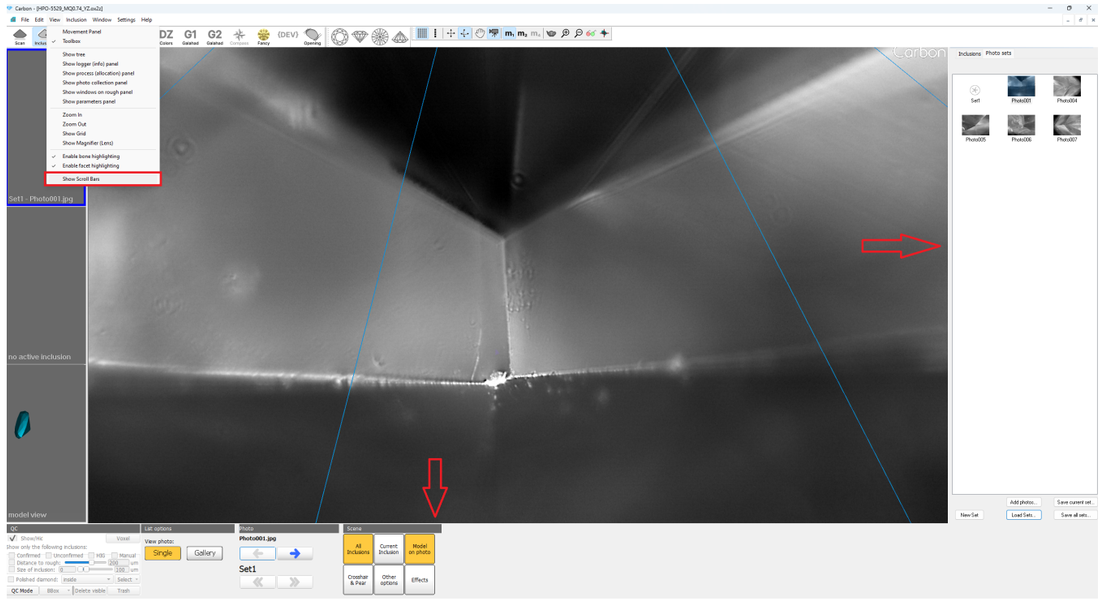


Zoom/move upgrade

Zoom has significantly improved:

- On the 3D scene, the zoom targets the area under the cursor, if there is a diamond underneath.
- On 2D it simply zooms under the cursor.

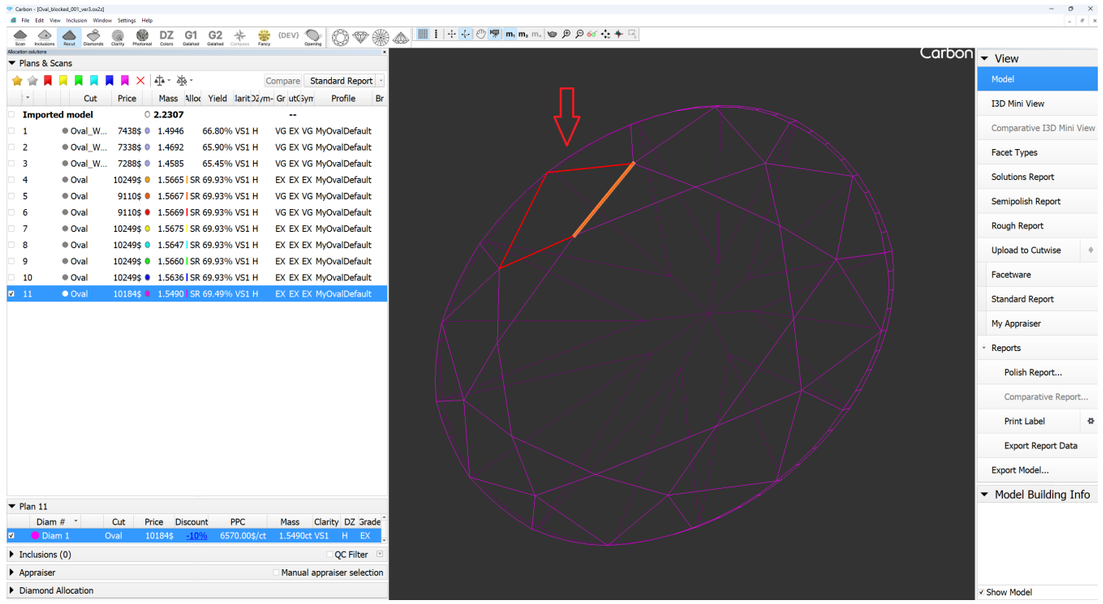
On the 2D scene, you can move around using the combination 'Left click + SHIFT + Mouse Move'.
Additionally, the scroll bars that appear when zooming in can be disabled in the menu item View -> Show Scroll Bars.



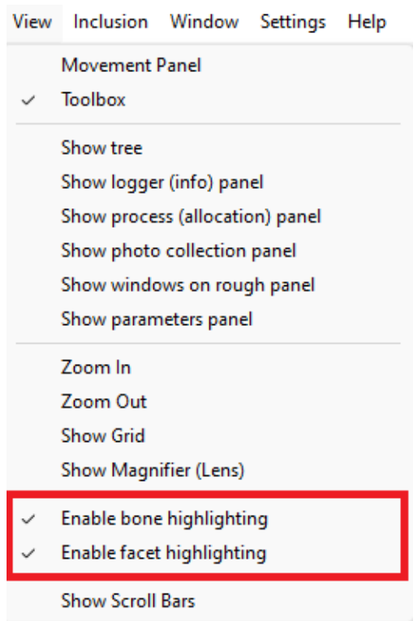
By double-clicking on the scene, you can reset all transformations (zoom and movements) made with the mouse.

Interactions with diamond

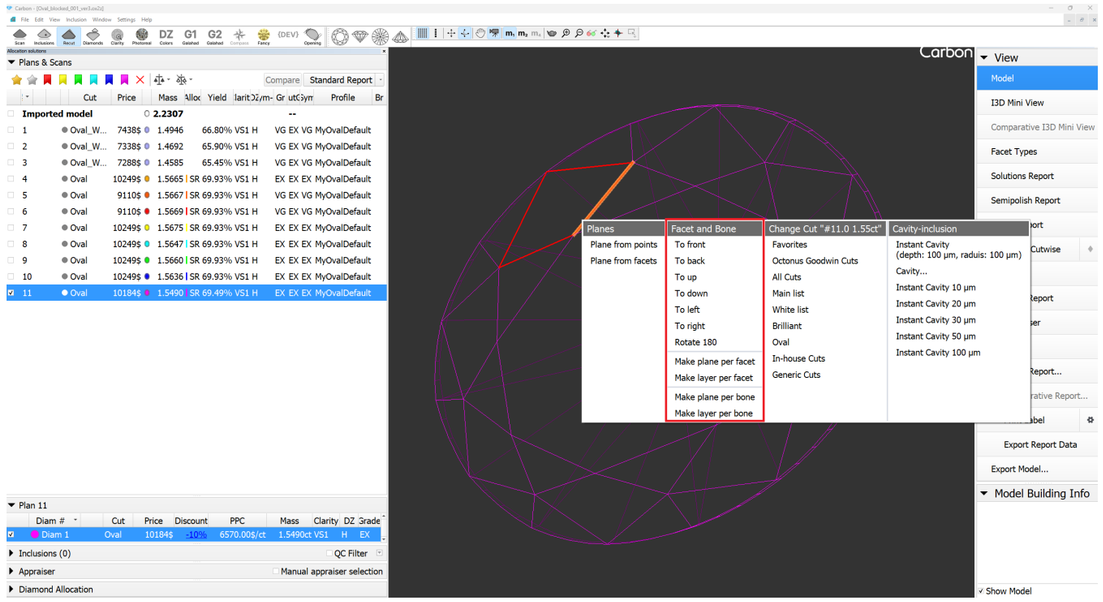
Diamond facets and edges are highlighted upon mouse hover.



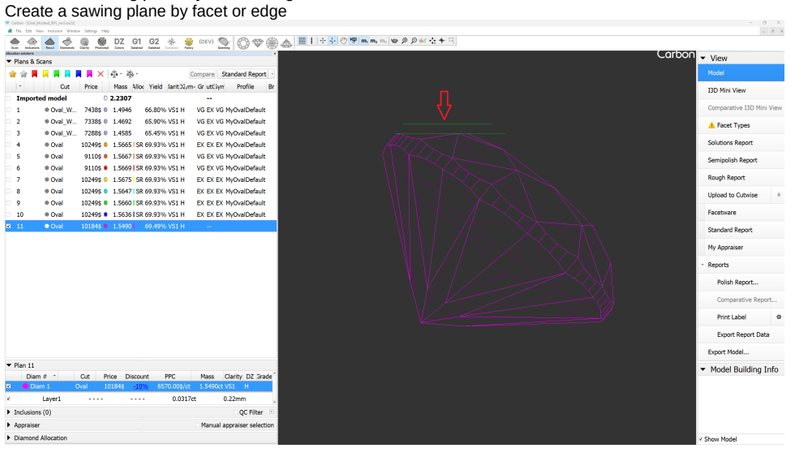
This feature is disabled by default, so you need to click on View -> Enable bone highlighting / Enable facet highlighting accordingly.



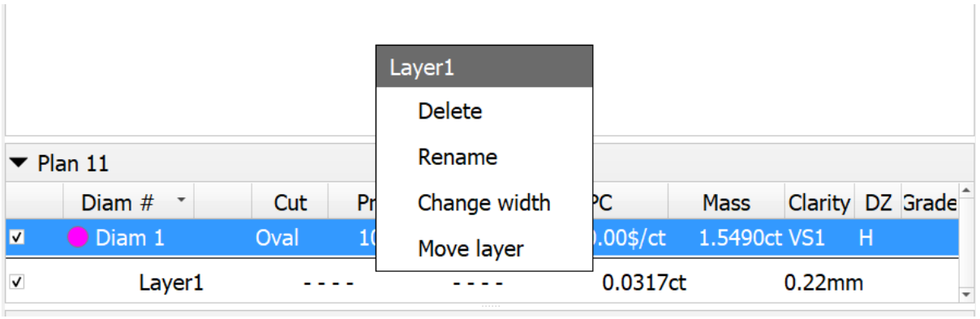
When the feature is enabled, some commands are available in the scene's context menu:



- Set the orientation of the diamond by facet
- Create a bounding plane by facet or edge
- Create a sawing plane by facet or edge



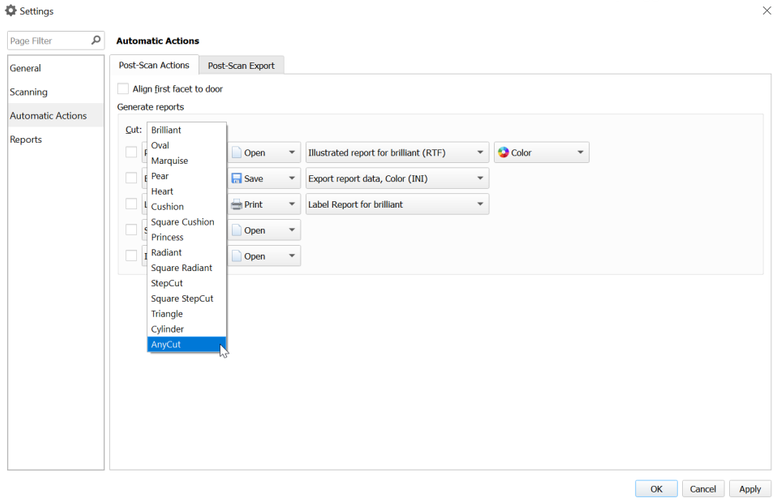
Since it's now possible to manually set sawing planes, we've added the ability to modify and delete them.



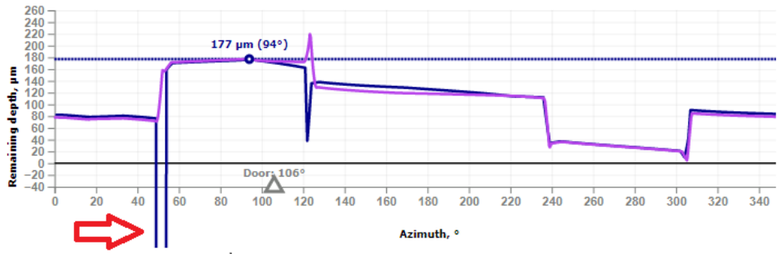
Fixed problems and improvements

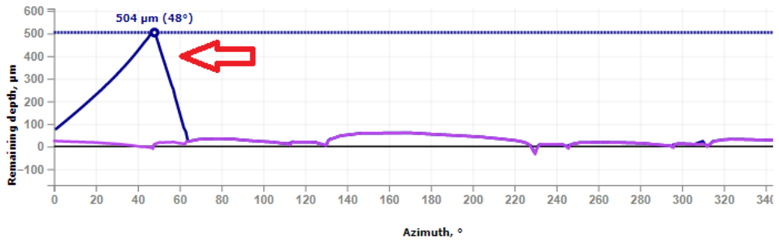
- Excluded the usage of Stone ID for file names in Cutwise export packages due to compatibility issues with the Cutwise server unpacker.
- Fixed the issue of the 'Upload to Cutwise' button remaining inactive when opening a new project before obtaining a link to an uploaded project.

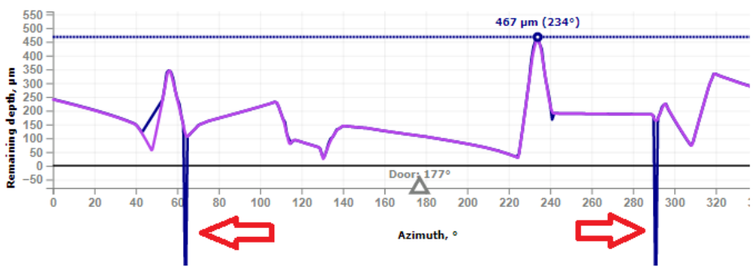
- Aqua preplans are now considered in the Recognition process in HP Carbon.
- Fixed an issue where Automatic actions or Report Buttons' actions were unintentionally triggered for all shapes when the current shape is AnyCut.

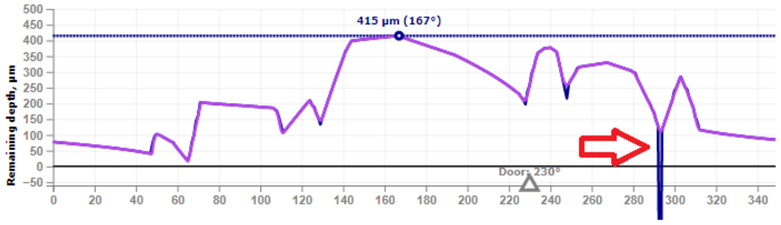


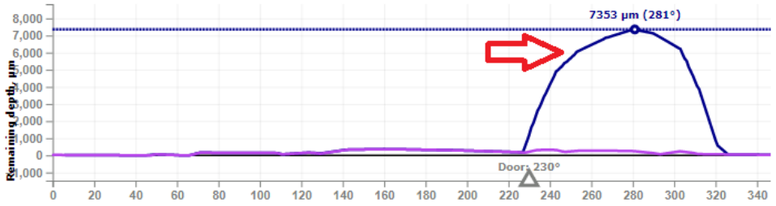
- The algorithm for calculating Remaining Depth Blue Line has been reworked. This fixed critical bugs in the old implementation. The purple line in the figure shows the behavior of the new version of the algorithm compared to the old one.


177 µm (94°)
Door: 106°
Remaining depth, µm
Azimuth, °

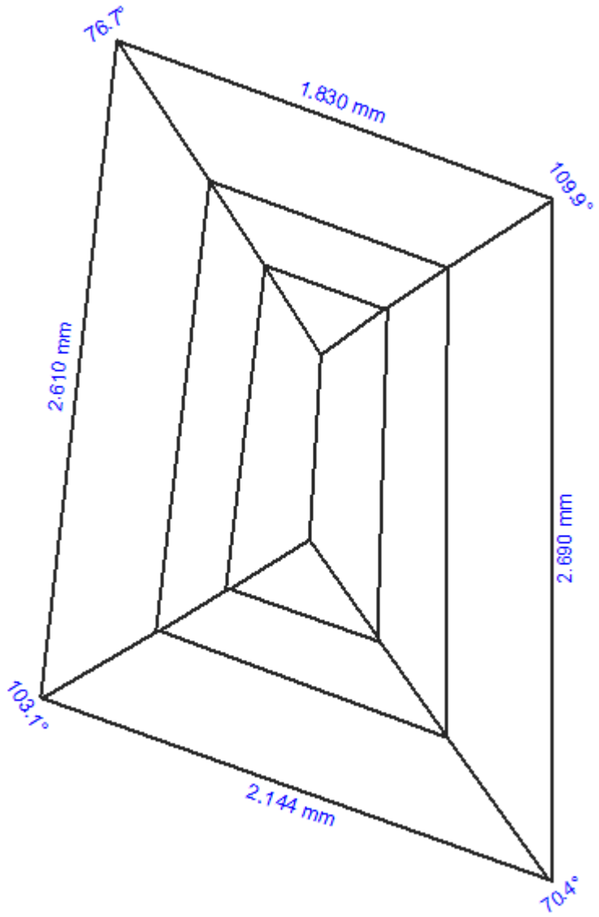

504 µm (48°)
Remaining depth, µm
Azimuth, °


467 µm (234°)
Door: 177°
Remaining depth, µm
Azimuth, °


415 µm (167°)
Door: 230°
Remaining depth, µm


7353 µm (281°)
Door: 230°
Remaining depth, µm

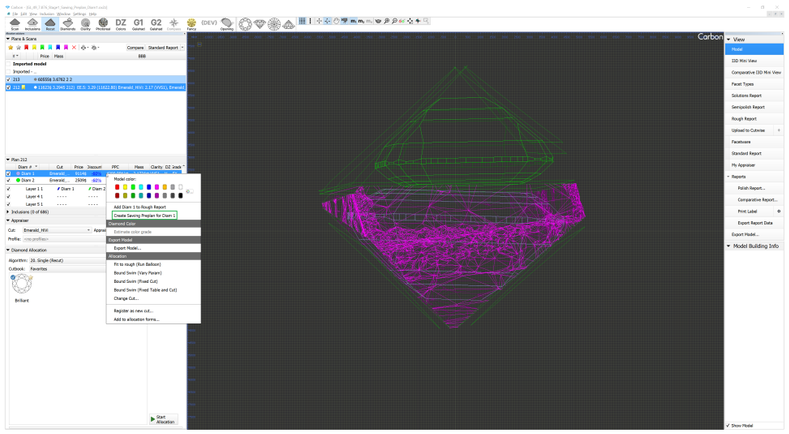
- For all cutting types, when dealing with asymmetrical cuts featuring an unsmooth girdle, illustrations depicting symmetry show facets with their angles and girdle lengths, while symmetry axes are omitted.



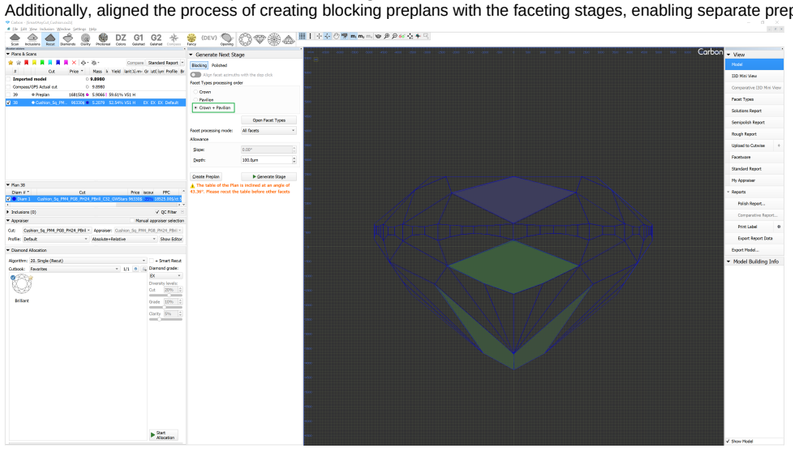
Bookmarks for images:
"PLOT_ACTUAL_LENGTH_AXIS_ASYM";
"PLOT_ACTUAL_LENGTH_AXIS_ASYM_CROWN";
"PLOT_LENGTH_AXIS_SYM_COR";
"PLOT_LENGTH_AXIS_SYM_COR_CROWN";
"PLOT_ACTUAL_WIDTH_AXIS_ASYM";
"PLOT_ACTUAL_WIDTH_AXIS_ASYM_CROWN";
"PLOT_WIDTH_AXIS_SYM_COR";
"PLOT_WIDTH_AXIS_SYM_COR_CROWN";
"PLOT_BOTH_AXES_SYM_COR";
"PLOT_BOTH_AXES_SYM_COR_CROWN";

These parameters are also outputted to separate bookmarks: angles in GIRDLE_INTERNAL_ANGLE_DEG_..., and lengths in GIRDLE_SIDE_LENGTH_MM_...

- Fixed sawing preplan creation for solutions with multiple sawing layers.
  Previously, the consideration of all sawing layers was incomplete; now, it has been fixed.



- Added the "Crown + Pavilion" option in G1 Blocking mode.
  Additionally, aligned the process of creating blocking preplans with the faceting stages, enabling separate preplan creation for Crown, Pavilion, as well as Crown + Pavilion.



- Fixed rare program crashes during
  - Facet Marking transfer to semipolished model;
  - MEC algorithm
  - SmartRecut algirithm in streaming mode