

# 2023-06-03 - HP Carbon 1.9.2

Here you can find information about what is new in HP Carbon version 1.9.2.

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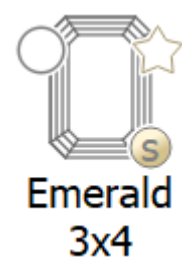
## Smart Cuts. Updates

### Special Appraisers for Smart Cuts

Video   Special profiles of appraiser for Smart Cuts				
Published:	2023, April 04	Last Updated:	2023, April 04	v.2.0
Your browser does not support the HTML5 video element				
<b>Video summary:</b> <ul style="list-style-type: none"><li>Smart Cuts as the new Cutting type was implemented in HP Carbon.</li><li>Major Smart Cuts advantages are described in the video: plug-and-play profiles and user editable profiles.</li><li>Plug-and-play profiles: High Performance profile, Commercial profile, Max Mass profile.</li><li>The High Performance profile prioritizes Performance over Yield, and produces solutions with high Optical Performance and symmetry, by limiting the Sweet Line and Generic Smart Cut Parameters.</li><li>The Commercial profile is an optimal balance between Performance and Yield.</li><li>The Max Mass profile prioritizes Yield, and gives maximum mass solutions.</li><li>The client can choose one of these plug and play profiles, depending on required Performance and Yield ratio, run the optimization, and get good results right away.</li><li>One can open the demo projects using the following QR codes.</li></ul>				
<b>Video keywords:</b> Smart Cuts, High Performance profile, Commercial profile, Max Mass profile, Performance/Yield ratio				
Data	<a href="#">Princess-SmartDLL_Demo.ox2z</a>			
	<a href="#">Princess-SmartDLL_Demo_User_Profile1.ox2z</a>			
	<a href="#">Princess-SmartDLL_Demo (Cutwise)</a>			
	<a href="#">Princess-SmartDLL_Demo_User_Profile1 (Cutwise)</a>			
Published in:	Release Notes	<a href="#">2023-06-03 - HP Carbon 1.9.2</a>		
	Documentation	NA		
	Playlists	NA		
	Also	<a href="#">As Separate Page</a>   <a href="#">On YouTube</a>   <a href="#">Specification</a>		

### Plug-and-play appraiser for Emerald 3x4 Smart Cut

Profiles of appraiser for Emerald 3x4 Smart Cut were updated.



There are 4 non-editable pre-configured plug-and-play profiles:

- Ultra\_High\_Performance
- High\_performance
- Commercial
- Max\_Mass

And two user profiles:

- User\_Profile1
- User\_Profile2

Pre-configured profiles are designed to give users a fast start with the allocation and consider the user's needs. Three profiles are required to grant the user the desired range of options:

- Ultra\_High\_Performance profile limits the parameter range to achieve high performance and symmetry with yield compromise.
- High\_Performance profile uses a wider parameter range but still gives solutions with high performance and symmetry.
- Commercial profile gives balanced performance and yield.
- Max\_Mass profile is designed to give high-yield solutions but can sacrifice Optical performance.

Solutions created with pre-configured Profiles are shown in the Cutwise Project:

<https://cutwise.com/projects/65ed413d-33e4-4658-a57c-9ec529e984ec/solutions?sort=G6pEDC9kLwhZQwWU0rG8fR0kZuyRr7fqadGTLQK2>

	Ultra_High Performance		High_Performance		Commercial		Max_Mass	
	SCAN	970	929	904	939	916	946	926
	22.91ct — 🔍❤️	15.16ct \$413,868 🔍❤️	15.33ct \$418,509 🔍❤️	15.64ct \$426,972 🔍❤️	15.76ct \$430,248 🔍❤️	16.00ct \$436,800 🔍❤️	16.48ct \$449,904 🔍❤️	17.01ct \$464,373 🔍❤️
Product SKU	Emerald3_Demo2	970-Emerald3_Dem...	929-Emerald3_Dem...	904-Emerald3_Dem...	939-Emerald3_Dem...	916-Emerald3_Dem...	946-Emerald3_Dem...	926-Emerald3_Dem...
Office								
ASET	—							
Price	—	\$413,868	\$418,509	\$426,972	\$430,248	\$436,800	\$449,904	\$464,373
Price Per Carat	—	\$27,300/ct	\$27,300/ct	\$27,300/ct	\$27,300/ct	\$27,300/ct	\$27,300/ct	\$27,300/ct
Carat Weight	22.91ct	15.16ct	15.33ct	15.64ct	15.76ct	16.00ct	16.48ct	17.01ct
Shape	—	1.42	1.42	1.44	1.43	1.33	1.31	1.06
Normalized Performance	—	1.42	1.42	1.44	1.43	1.33	1.31	1.06
Global Performance	—	1.42	1.42	1.44	1.43	1.33	1.31	1.06
Fire	—	5.63	5.86	5.89	6.39	6.30	5.83	4.00
Brilliance	—	0.84	0.82	0.84	0.80	0.72	0.73	0.63
Optical Symmetry	—	7.97	8.00	7.96	7.59	7.64	7.08	7.12
Spread	—	-0.48ct	-0.93ct	-1.27ct	-1.06ct	-1.62ct	-1.70ct	-2.92ct

Users can select one of the pre-configured profiles and immediately go to the allocation procedure without laborious Profiles modification.

For users that want to manually adjust Profiles – Pre-configured profiles can be a good starting point for modification. Users can copy Parameters from pre-configured profiles to one of the editable profiles User\_Profile1 or User\_Profile2 and then modify desired Parameters (for instance, Total depth, Table or Crown/Pavilion Main facets Slopes limits) as per Factory requirements.

**IMPORTANT NOTE**

If you already use version 1.7.X and newer, then note:

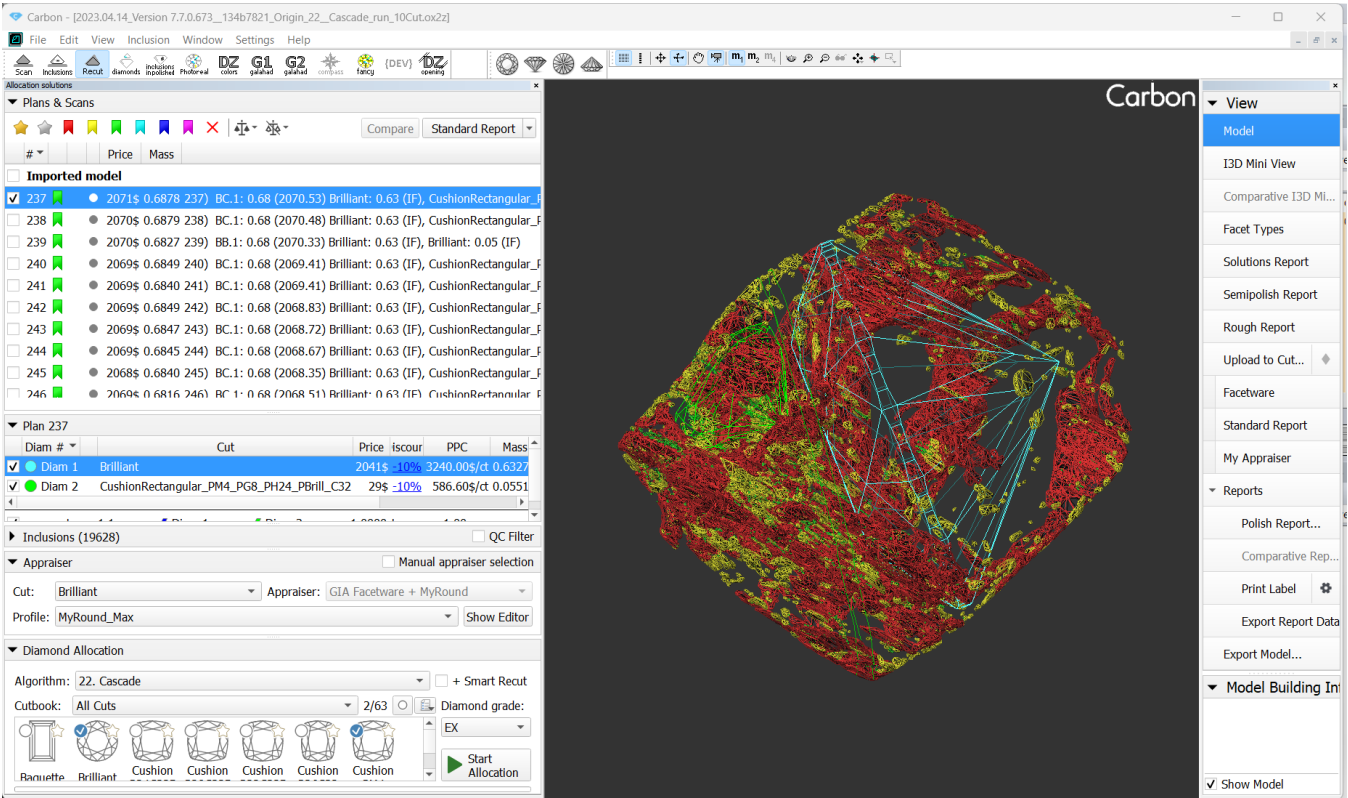
Current 1.9.2 version doesn't replace existing appraiser Emerald 3X4. Thus for replacement it is required to delete folder Emerald\_3x4 from C:\ProgramData\OctoNus Software\CommonData\Cuttings before installation of new version 1.9.2.

# Algorithms of allocation

## New Algorithm - 22. Cascade

An algorithm 22. Cascade is available to allocate the solutions with two diamonds. Unlike its predecessor 13. Cascade-2M, the new algorithm remains operable for cases where 5-10 different cuts are launched simultaneously and the number of inclusions in rough model exceeds 20,000-30,000 pieces.

To use the new algorithm is to select 22. Cascade from algorithm list, check necessary cuts and press Start allocation.



## MESM for blocking algorithm updates


Video   MESM for blocking				
Published:		2023, April 14	Last Updated:	2023, April 14
v.3.0				
Your browser does not support the HTML5 video element				
<b>Video summary:</b> <ul style="list-style-type: none"><li>new algorithm: "MESM for blocking" is developed. The algorithm "MESM for blocking" finds a Minimum Enclosing Symmetrical Model.</li><li>After finding minimum enclosing symmetrical model the algorithm pushes the facets by technological allowances. This is required to not damage the SmartRecut solution because of hardware errors.</li><li>Then the algorithm pushes sets of adjacent facets on the pavilion and on the crown. They will remain on the diamond after blocking. These facets can be used as reference to determine the orientation of the model after blocking in the SmartRecut solution basis.</li><li>Solutions name contains number of reference facets.</li><li>The MESM algorithm is adapted for cuts with a non-convex girdle</li></ul>				
<b>Video keywords:</b> MESM, blocking, algorithm description, presets, updates				
Data	<a href="#">MESM_Demo_Oval.ox2z</a>			
	<a href="#">Bad_DUO485-39_Cube_Instead_MESM-1.ox2z</a>			
	<a href="#">Heart_for_MESM_Not_Ok_2023_02_20.ox2z</a>			
Published in:	Release Notes	<a href="#">2023-06-03 - HP Carbon 1.9.2</a>		
	Documentation	NA		
	Playlists	NA		
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- The "MESM for blocking" algorithm have learned to work with non-convex cuts, including cuts with many grooves.

- If an input model for algorithm "MESM for blocking" is highly non-symmetric, then the algorithm may find wrong pairs of symmetrical facets. That is why sometimes the algorithm could not find an absolutely symmetric solution in previous versions of HP Carbon. It gave an error as cube solutions not selected cut. Now the algorithm run a fallback scenario in given situations. During the fallback scenario the symmetry tends to be absolute, but absolute symmetry is not mandatory.
- The "MESM for blocking" solutions name contains number of reference facets.

### New Algorithm - MEC for Aqua Bruting

A diamond bruting machine produce a vertical smooth girdle. But the allocation algorithms solution girdle is faceted. Bruting machine operator must see in the program what result he will get in reality. That is why HP Carbon needs to find a smooth cylinder circumscribed around a selected solution. This is now can be done by a new algorithm - "23. MEC for Aqua bruting". "MEC for Aqua bruting" is applicable for any cuts

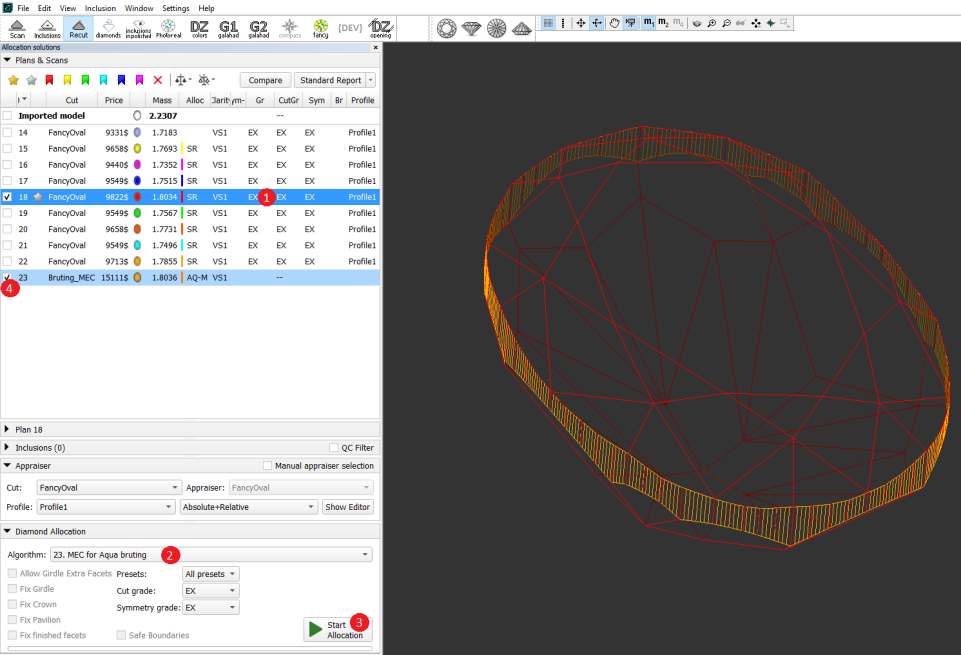
 Smart Recut solutions for "Brilliant" cut has non-vertical girdle. "MEC for Aqua bruting" can cut off a bit the vertices of such solution which can lead to a worse grade. We will fix it in the next HPCarbon version. For now use "MEC for round bruting" in "Brilliant" workflow

"MEC" in "MEC for Aqua bruting" means Minimum Enclosing Curve. "MEC for Aqua bruting" solution is fully inside scan. Smooth cylinder can cross the scan, then you get knives.

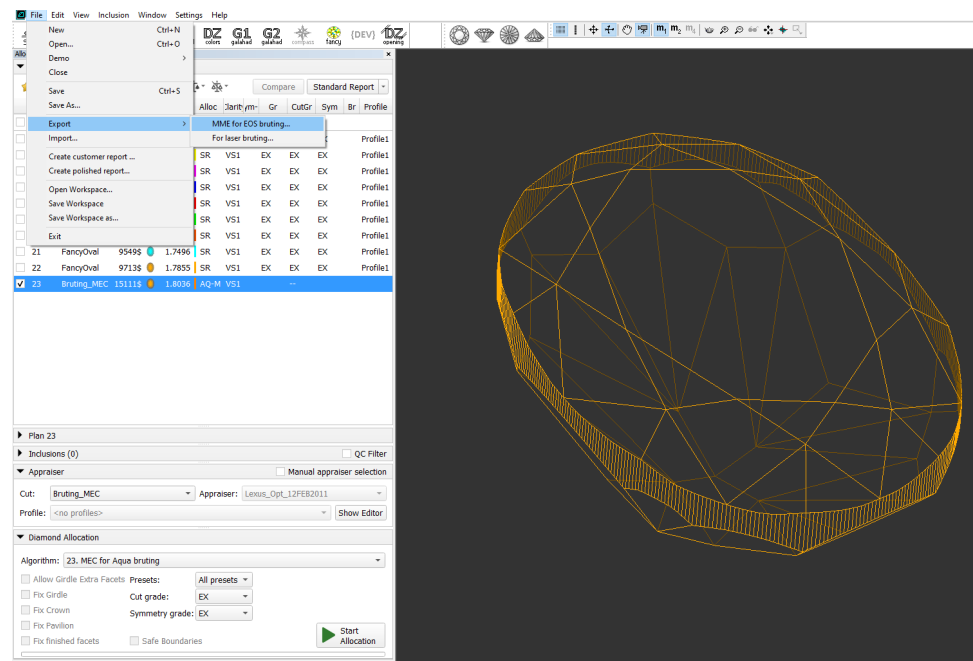
[blocked URL](#)

To use the algorithm, first allocate your solutions via Recut > Smart Recut, then:

1. Select the solution.
2. Select **Algorithm** "23. MEC for Aqua bruting".
3. Run allocation. As allocation is finished, in the solution list, the new model representing a bruting radius is displayed.
4. In the solution list, select this solution.



5. From the main menu, select **File > Export > MME for EOS brutng...** or **For laser brutng...**. Set name and location for your model file.









6. In your brutng software, use the created file.

## Reports improvements

### New features for Remaining Depth mode in Comparative I3D Reports

In the previous version of Reports, the Remaining Depth mode lacked sufficient visual information to accurately track changes in deviation from the reference model across the entire girdle during the brutng process. Fortunately, with the release of version 1.9.1 of Comparative I3D Reports, several valuable enhancements have been introduced to address this limitation:

- Chart Representation:** The new version incorporates a chart in the Remaining Depth mode, visually illustrating the minimum and maximum deviation from the reference model by azimuth along the girdle. This chart provides a clear representation of deviation changes and their distribution. The horizontal axis represents the azimuth angle, ranging from 0 to 360 degrees along the girdle, while the vertical axis represents deviation values, ranging from -75 to 150 microns. The maximum depth is visually represented by a vivid horizontal green line , while the minimum depth is indicated by a vivid horizontal red line. Color-coded tick marks are used to emphasize the precise azimuths where these depths occur. Additionally, there are semi-transparent green and red horizontal lines that denote positive and negative average deviations, respectively, from the reference model's girdle. These semi-transparent lines are positioned between the vivid horizontal lines that illustrate extreme depths. The average negative depth indicates overcutting of the girdle, while the average positive depth suggests that the girdle is not completely cut off. For better correlation between a chart and its corresponding 3D model, the door's location is explicitly marked on the plot.

The legend for the lines displayed on the chart	
 the maximum depth	 the maximum depth by azimuth
 a positive average deviation from the reference model's girdle	
 a negative average deviation from the reference model's girdle	 the minimum depth by azimuth
 the minimum depth	

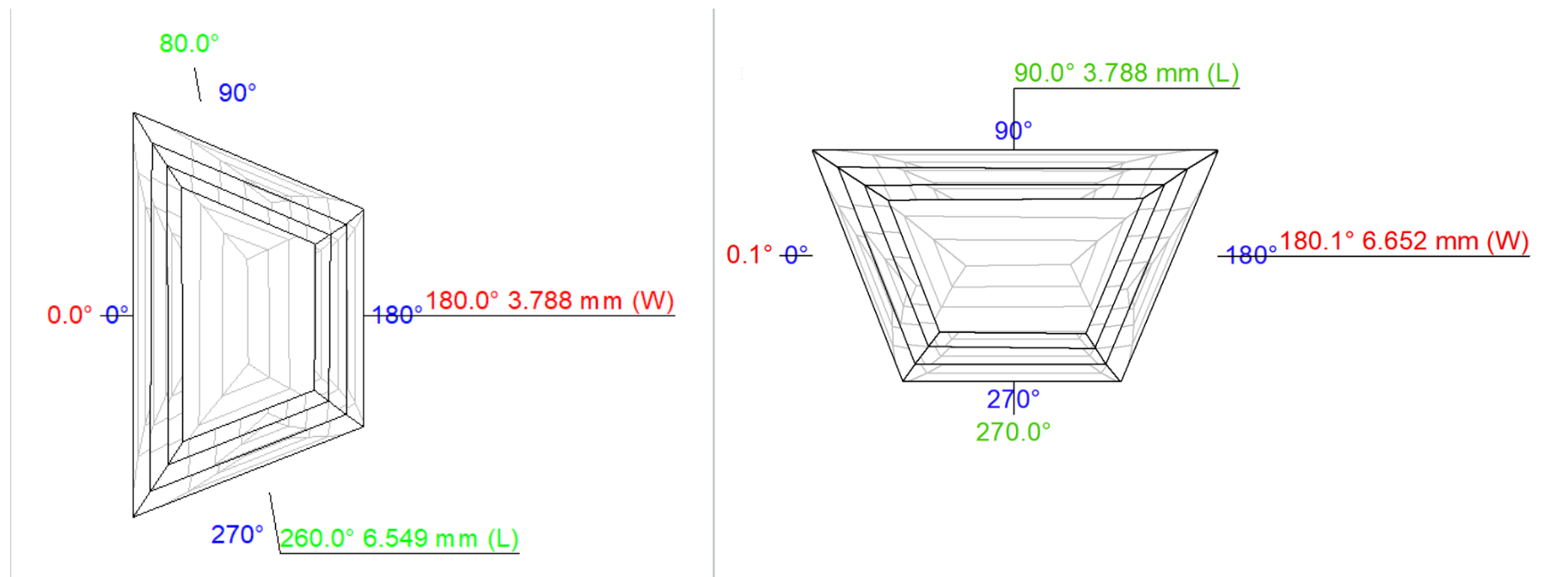
- Girdle Markers:** To facilitate the identification of areas with significant deviation, markers have been implemented on the girdle to indicate the minimum and maximum depths. These markers serve as reference points, enhancing the ability to track deviations accurately. When the camera's inclination towards the table resides within the ranges of 0-45 or 135-180 degrees, the minimum (red) and maximum (green) labels appear as colored circles next to the girdle, each supplemented with its corresponding deviation value. Yet, when the camera's angle falls within the 45-135 degrees range, these markers adapt, transitioning from a circle to a cross.
- Depth Information:** Comparative I3D Reports now provide comprehensive information on the minimum, maximum, and average negative and positive depths. These depth metrics offer valuable insights into the brutng process, empowering users to analyze and understand the extent of deviation.
- Color Palette Enhancement:** The color palette for the Remaining Depth mode has been repositioned, improving accessibility and enabling users to easily differentiate between various deviation values.

Overall, these updates significantly enhance visualization and provide more comprehensive information for analyzing deviation during the brutng process along the girdle. Users can now track changes with greater accuracy, identify areas of concern more easily, and make well-informed decisions based on the detailed data provided by the enhanced Comparative I3D Reports.

### Trapezoid cut - Length and Width calculation

We have changed model orientation in report and length and width measurement for trapezoid cut:

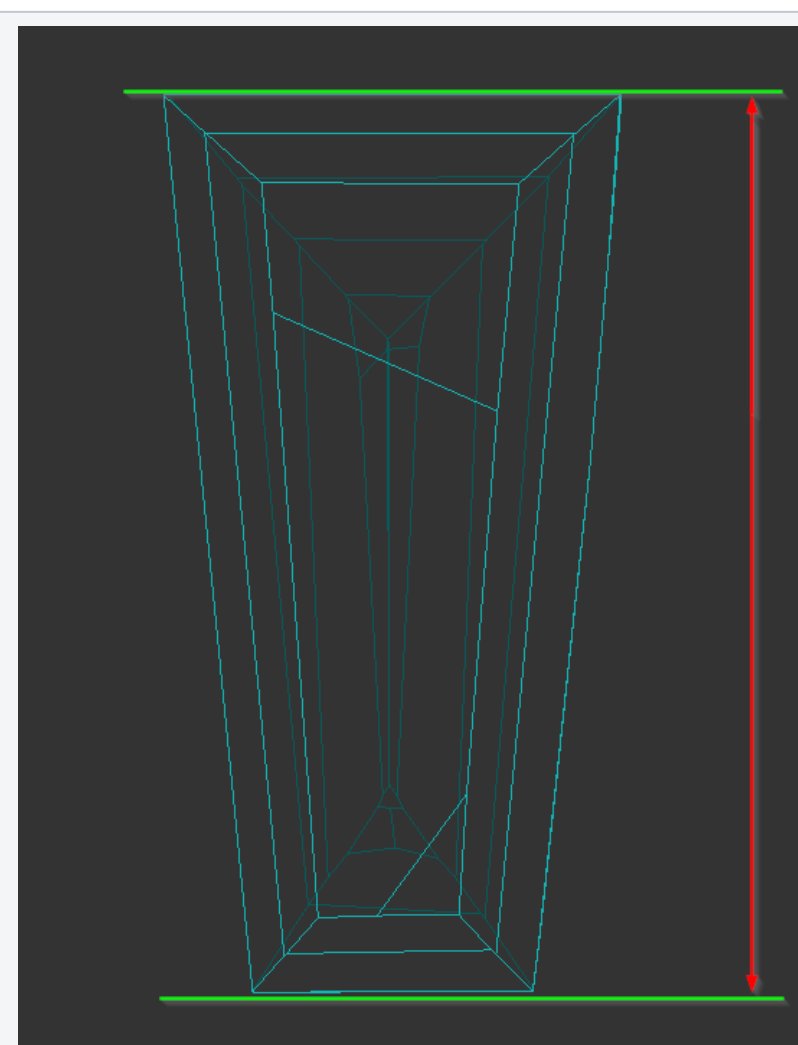
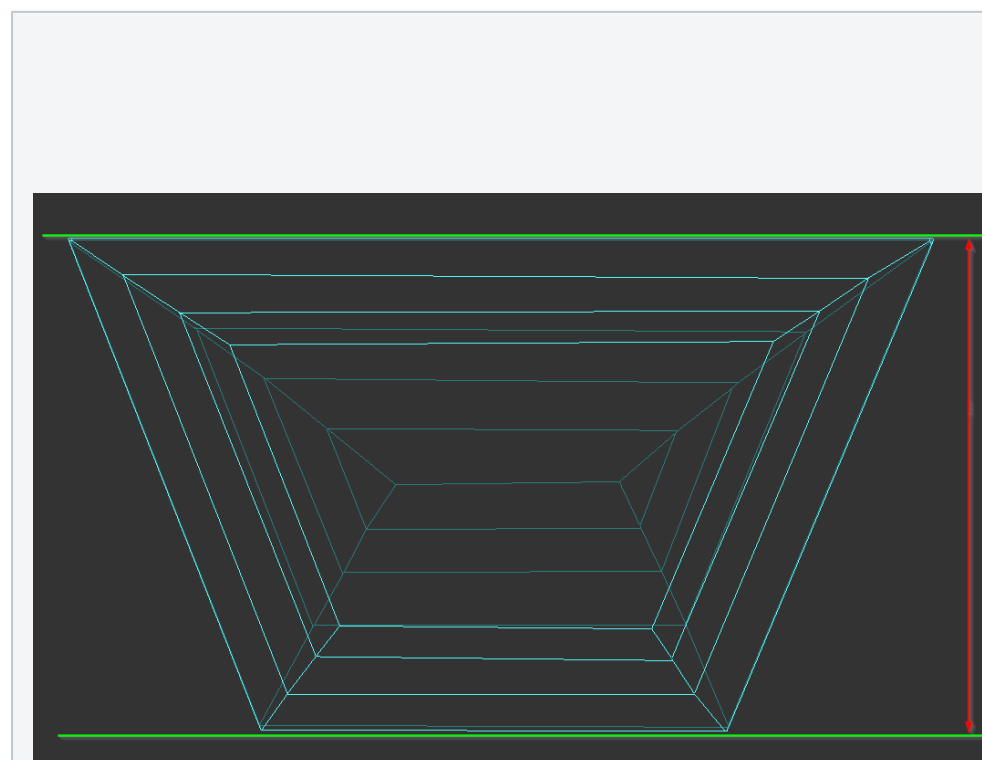
Before	Now



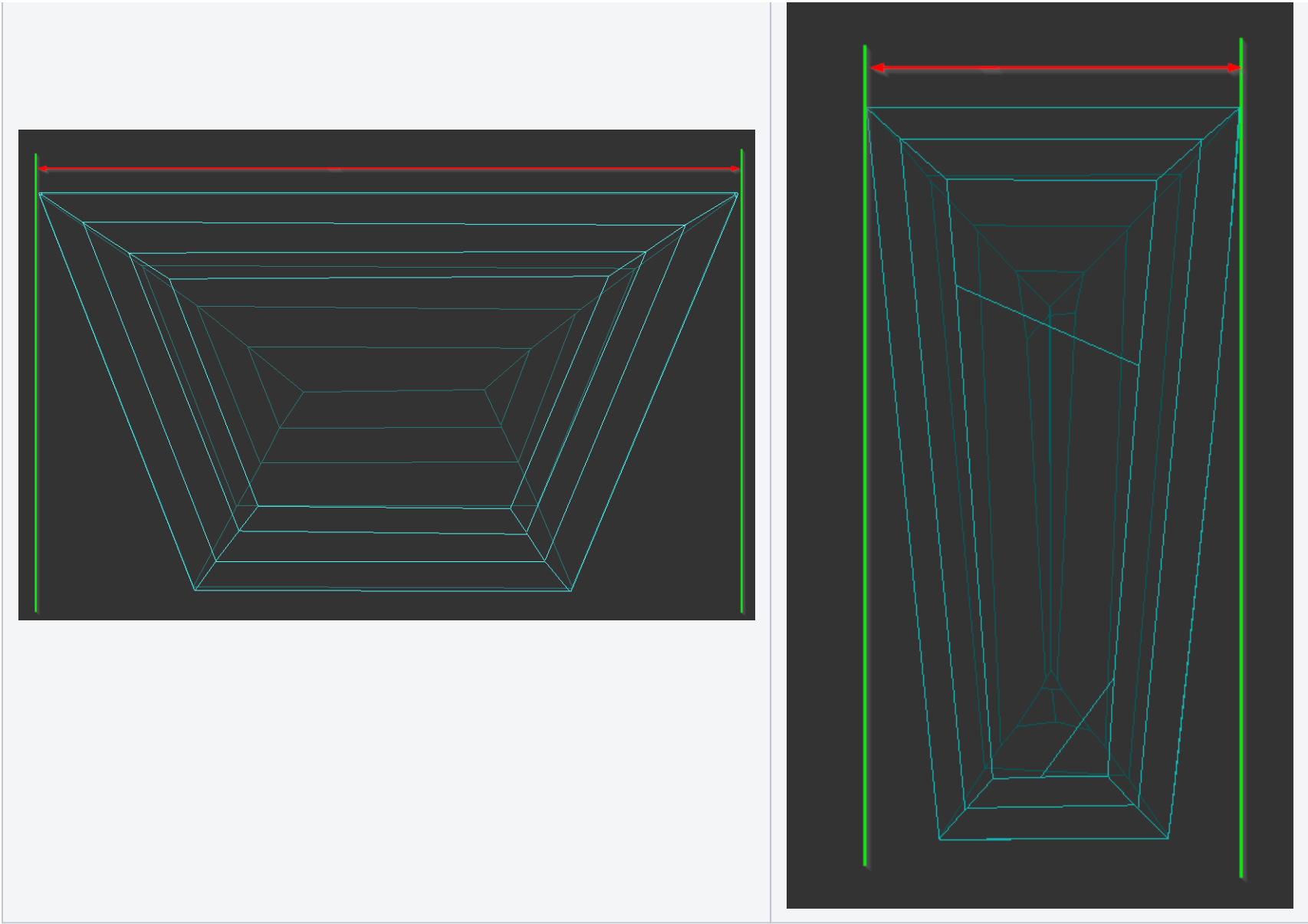
Now model is oriented in report basis in such way that symmetry axis is vertical and most wide width side is located on top.

New definitions of Length and Width for Trapezoid:

- Length is measured as local ( $\pm 10$  degrees from vertical) diameter minimum parallel to vertical axis symmetry direction:



- Width is measured as local ( $\pm 10$  degrees) diameter maximum perpendicular to axis symmetry direction:

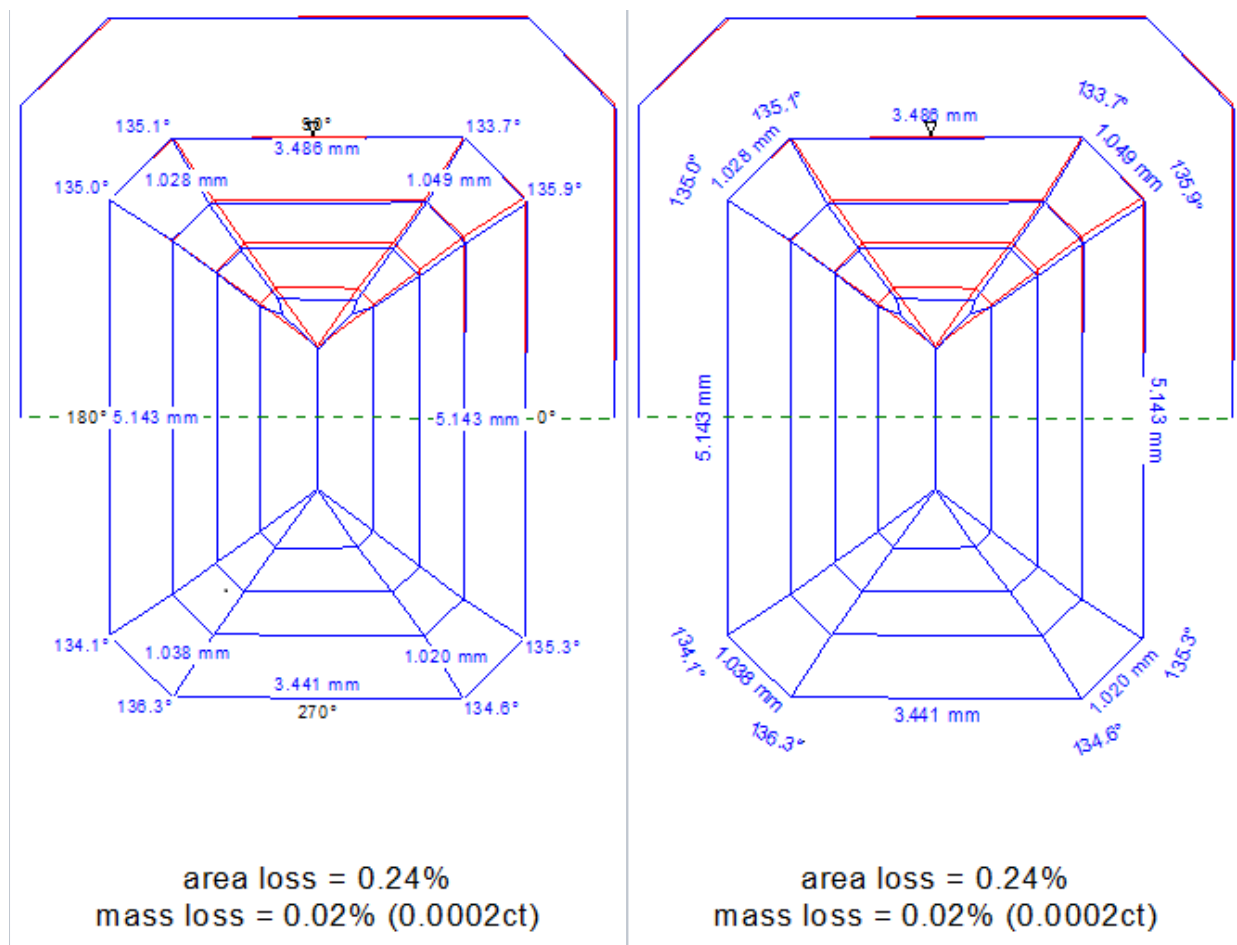


There is a documentation [Trapezoid Length, Width and some other parameters calculation](#) with detailed detailed information on how to calculate these measurements.

Axis symmetry picture view

We have moved the placement of the numbers on the axis symmetry pictures for cuts with long girdle facets to improve performance view. This update optimizes the positioning of the numbers, allowing for easier visualization and analysis of the symmetry pictures.

HPCarbon ver. 1.7.6	HPCarbon ver. 1.9.2



## SmartRecut updates

### SmartRecut - new parameter - Angles\_HorizontalEdgesControl

A new parameter "Angles\_HorizontalEdgesControl" is added only to SmartRecut presets. It is necessary to control horizontal edges in step cuts. Parameter value is 0.5° by default. The value of the parameter simultaneously determines what the horizontal edges are and what they should be in SR solutions. The parameter does not apply to the table, culet and girdle edges, they are controlled by other parameters



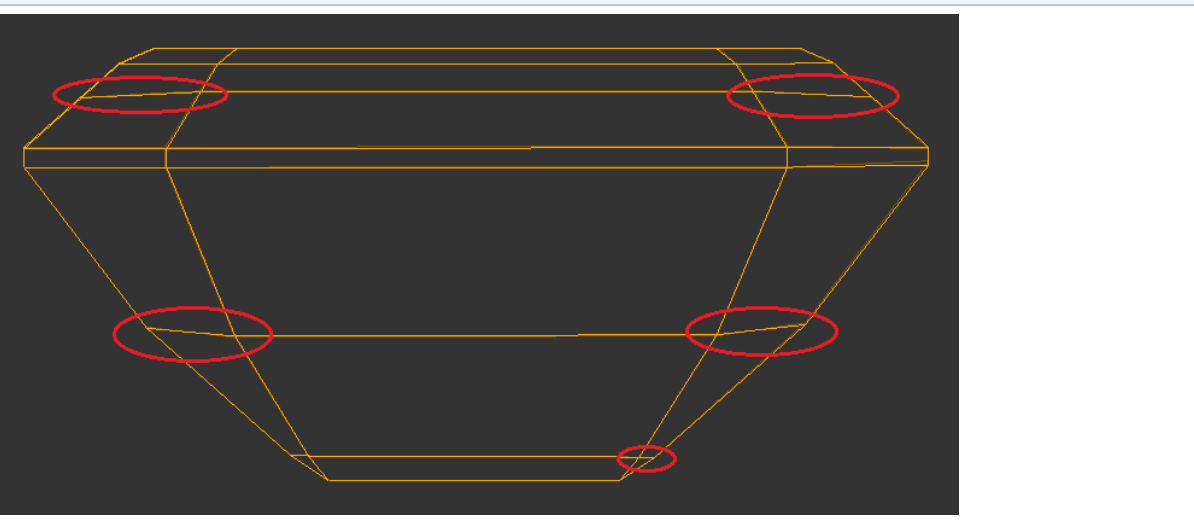
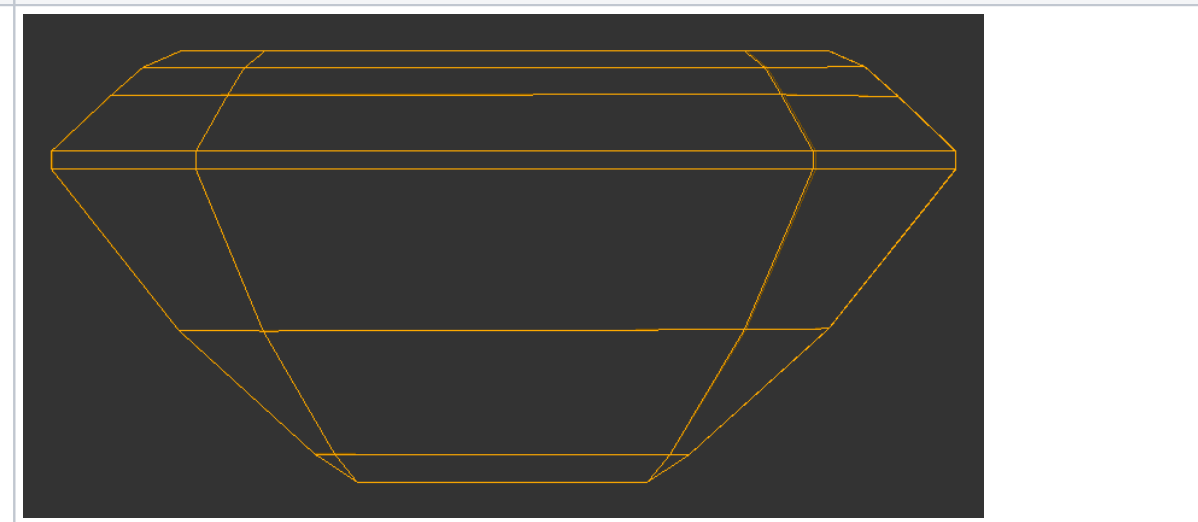
Appraiser Editor

MyAnyCut

Profile: MyAnyCutProfile5

Hide Presets

Absolute Proportions	Absolute Symmetry	Relative Proportions	Relative Symmetry	Other	Discounts																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Before	Now
	

## Facet Types window improvements

Some operations in the Facet Types window were performed automatically without any notification or a user's consent.

The execution of these operations has been corrected.

**1) The Facet Types are missing or incorrect. In that case the types are automatically generated or corrected, respectively.**

Previously, they were applied to the model automatically, even if the user did nothing and closed the window with escape or cancel. There was no clear message that the types were automatically changed. Also, the warning sign on the Facet Types button in the View panel was not working properly.

Now generated (or corrected) Facet Types are not applied to the model automatically, as well the notifications are shown. The user can save the automatic Facet Types by clicking the Ok button or refuse by the Cancel button.

◆ \* Facet Types

Facets	Element	*	Tier	Type	SubType	No.	Color	Alias
✕ 1	Table							Rename...
✕ 8	Crown			Main				Rename...
✕ 16	Crown			Half				Rename...
✕ 8	Crown			Star				Rename...
✕ 64	Girdle							Rename...
✕ 8	Pavilion			Main				Rename...
✕ 16	Pavilion			Half				Rename...
✕ 1	Culet							Rename...

Total: 122 facets

SortNew Group

⚠ Facet Types were automatically generated. ✕

From Sample...Basic TypesAuto TypesOk

Export SampleMake ReportCancel

◆ \* Facet Types

Facets	Element	*	Tier	Type	SubType	No.	Color	Alias
✕ 1	Table							Rename...
✕ 4	Crown			Main				Rename...
✕ 8	Crown			Half		1		Rename...
✕ 8	Crown			Half		2		Rename...
✕ 8	Crown			Star				Rename...
✕ 4	Crown			Corner				Rename...
✕ 72	Girdle							Rename...
✕ 4	Pavilion		1	Main				Rename...
✕ 8	Pavilion		1	Half		1		Rename...
✕ 8	Pavilion		1	Half		2		Rename...
✕ 4	Pavilion		1	Corner				Rename...
✕ 4	Pavilion		2	Main				Rename...
✕ 8	Pavilion		2	Half		1		Rename...
✕ 8	Pavilion		2	Half		2		Rename...
✕ 8	Pavilion		2	Half		3		Rename...

Total: 157 facets

SortNew Group

⚠ Some Facet Types were automatically corrected. ✕

From Sample...Basic TypesAuto TypesOk

Export SampleMake ReportCancel

2) The buttons Apply/Close(Cancel) were replaced with standard Ok/Cancel.

Previously	Now

Apply	Apply	Ok
Close	Cancel	Cancel

3) The "Make Report" button.

Previously, any changes made by an operator were automatically saved, software closed Facet Types window. Herewith, Facet Types could not be undone.

Now changes are not automatically saved and the window is not closed. Thus, a user can cancel the changes after report analysis.

4) The message appears on closing the window if there are unsaved changes.

♦ Facet Types

Facets	Element	*	Tier	Type	SubType	No.	Color	Alias
✕ 1	Table							Rename...
✕ 4	Crown			Main				Rename...
✕ 8	Crown			Half		1		Rename...
✕ 8	Crown			Half		2		Rename...
✕ 8	Crown			Star				Rename...
✕ 4	Crown			Corner				Rename...
✕ 72	Girdle							Rename...
✕ 4	Pavilion	1		Main				Rename...
✕ 8	Pavilion	1		Half		1		Rename...
✕ 8	Pavilion	1		Half		2		Rename...
✕ 4	Pavilion	1		Corner				Rename...
✕ 4	Pavilion	2		Main				Rename...
✕ 8	Pavilion	2		Half		1		Rename...
✕ 8	Pavilion	2		Half		2		Rename...
✕ 8	Pavilion	2		Half		3		Rename...

Total: 157 facets

SortNew Group

Some Facet Types were automatically corrected.

From Sample...Basic TypesAuto Types

Export SampleMake Report

OkCancel

Carbon

Do you want to save changes to Facet Types?

SaveDon't SaveCancel

Building models of groove (concave) cuts within Shadow and XRay models.

Quality Shadow and Reflect models cannot correctly build the concave parts of shapes like Heart, flower and others. XRay model do not have such quality of big flat facets compared to Shadow and Reflect models.

We introduce a new special algorithm which applies grooves (major concavities) from XRay model onto quality shadow/reflect model.

Steps to operate:

- 1. Build the shadow/reflect quality model of the diamond or open existing project with quality model.
- 2. Import the concave model of the diamond (XRay-scan) using recognition option to match the position of the both models.
- 3. Rename the concave XRay scan model as "GrooveShaper" or "grv" to specify this model as source of groove geometry.

4. Right Click on the Shadow/Reflect Quality model and choose "Apply Groove".

☐ GrooveShaper0.9150

☒ Shadow0.9288

Model color of 'Shadow'

Rename 'Shadow'

Processing 'Shadow'

☒ Set as Main Scan

Estimate color grade for Shadow 0.9288 ct. ...

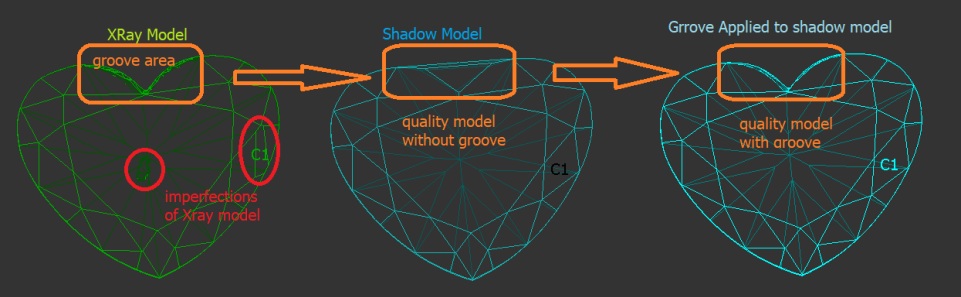
Apply Groove

Remove current parameter grades

Reappraise with active parameter appraiser

Processing Stage of 'Shadow': Polished

5. There will be created a new model with name like "AppliedGroove - Shadow" - this is the result of new algorithm.

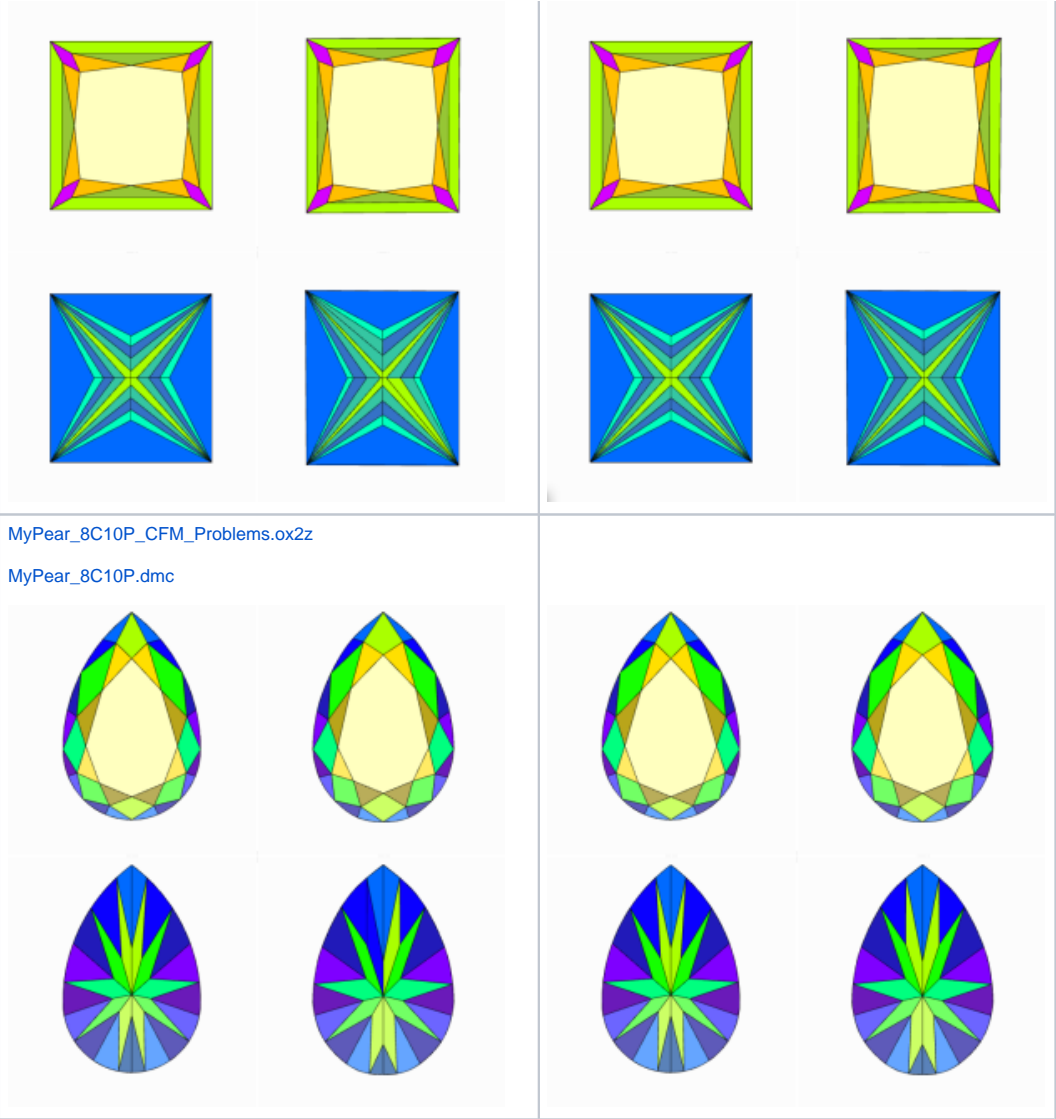


⚠ You should not enlarge the groove source model (XRay model) for this process. The new algorithm aimed to preserves the good facets of shadow model ignoring small mismatches and imperfections of XRay model, only deep groove facets are applied to result.

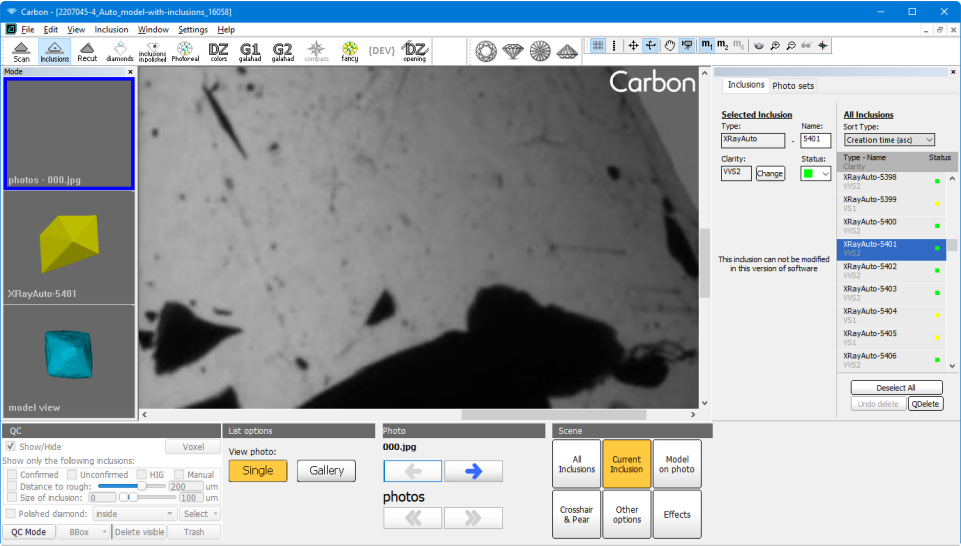
Fixed problems and improvements

- Speeded up model selection for comparison in Comparative I3D Mini View if at least one model from the comparison pair is complex, for instance, an X-Ray model.
- Fixed many bugs in Facet Types transferring for cases when crown and pavilion are strongly distorted but topologically equivalent in two models

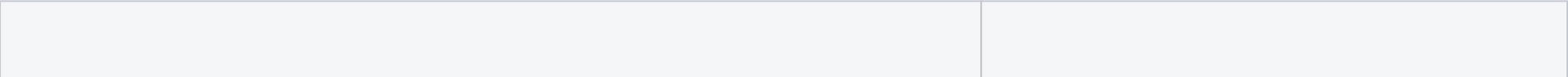
HP Carbon 1.7.6	HP Carbon 1.9.1
<div>60105_Sq_DJ041502L839_1.026cts_Fancy Yellow_scan.ox2z</div> <div>60105_Sq_DJ041502L839_1.026cts_Fancy Yellow_sample.dmc</div> <div></div>	<div></div> <div></div> <div></div>
<div>40020_stone1_Prince3s_scan.ox2z</div> <div>40020_stone1_Prince3s_sample.dmc</div> <div></div>	



- The layout for inclusion plotting and QC is added from M-Box software to HP Carbon software.
- Inclusion list is optimized (accelerated) for work with heavy projects containing about several thousand inclusions.



- Speeded up MESM for presets with reference facets
  - Corrected culet center calculation in SmartRecut AnyCut with big culets
  - The issue with freezing loading to Cutwise happen on occasion.
- Timeouts with a duration of 1 minute and a progress indicator were added to solve that issue.



Cutwise Log in

Username

hpcdev

Password

••••••••

Log in

Carbon

The connection to the Cutwise Agent has timed out. It is taking too long to respond.

- Check your computer's network connection.
- cutwise.com could be temporarily unavailable or too busy. Try again in a few moments.
- Probably there is a problem with the Cutwise Agent service on your computer. Restart the service.
- Please contact your system administrator.

OK