2025-12-11 - HP Carbon 3.0.3

Here you can find information about what is new in HP Carbon version 3.0.3.

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

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Allocation - global algorithms

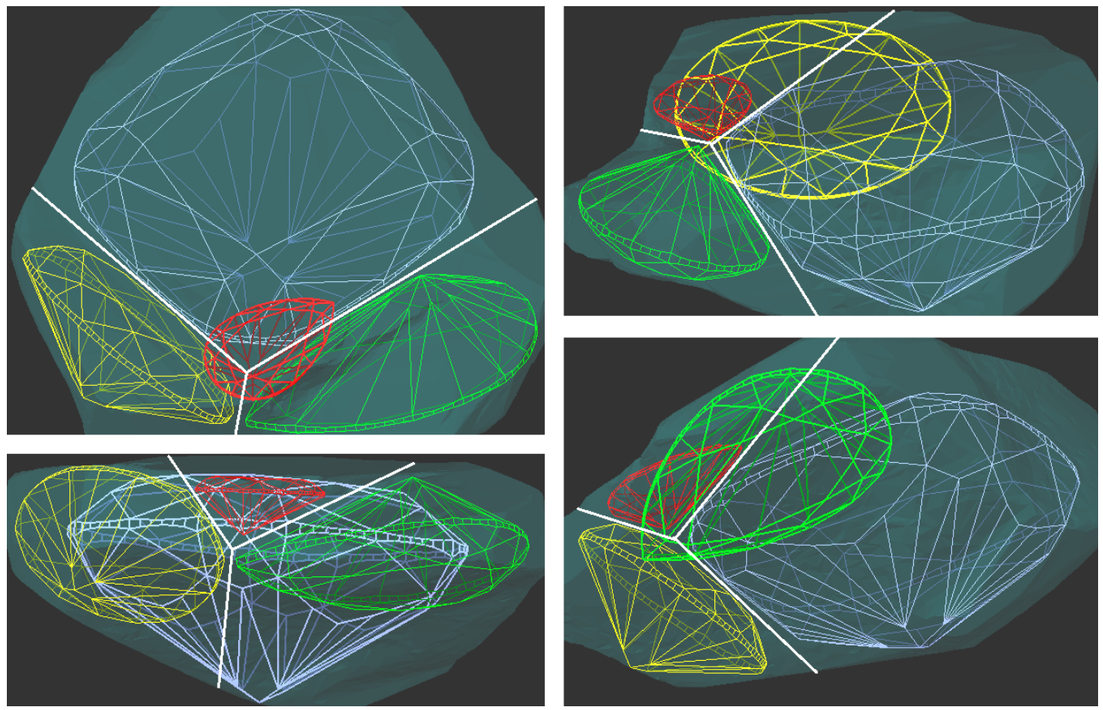
24. MultiDiamond and 24. MultiNext algorithms

Video | Algorithms "24. MultiDiamond" and "24. MultiNext"				
Published:	2024, December 13	**Last Updated:**	2025, January 10	**v.2.3**
Your browser does not support the HTML5 video element				
Video summary: • Introducing the new allocation algorithms: "24. MultiDiamond" and "24. MultiNext" • Solutions from the "24. MultiDiamond" algorithm can always be sawn, and we provide a sequence of sawing layers and pies to guide this process. • Specified number of diamonds in solutions • Solutions can always be sawn • Variation modes: FixedForm and FlexibleForm				
Video keywords: Parameters, girdle shape, comparison with ideal shape, quality control, reports				
Data	CantSawing.ox2z CVD_MultiDiamond.ox2z			
Published in:	**Release Notes**	2025-12-11 - HP Carbon 3.0.3		
	Documentation	NA		
	Playlists	NA		
	Also	As Separate Page | On YouTube | Specification		

24. MultiDiamond

Allocation of 3 (three) or more diamonds has become the standard for all sizes and types of rough stones. On average, a solution contains 5 (five) diamonds. An important question when allocating multiple diamonds is "How to perform Sawing?" Not all solutions with 4 (four) or more diamonds can be sawn using modern sawing technologies.

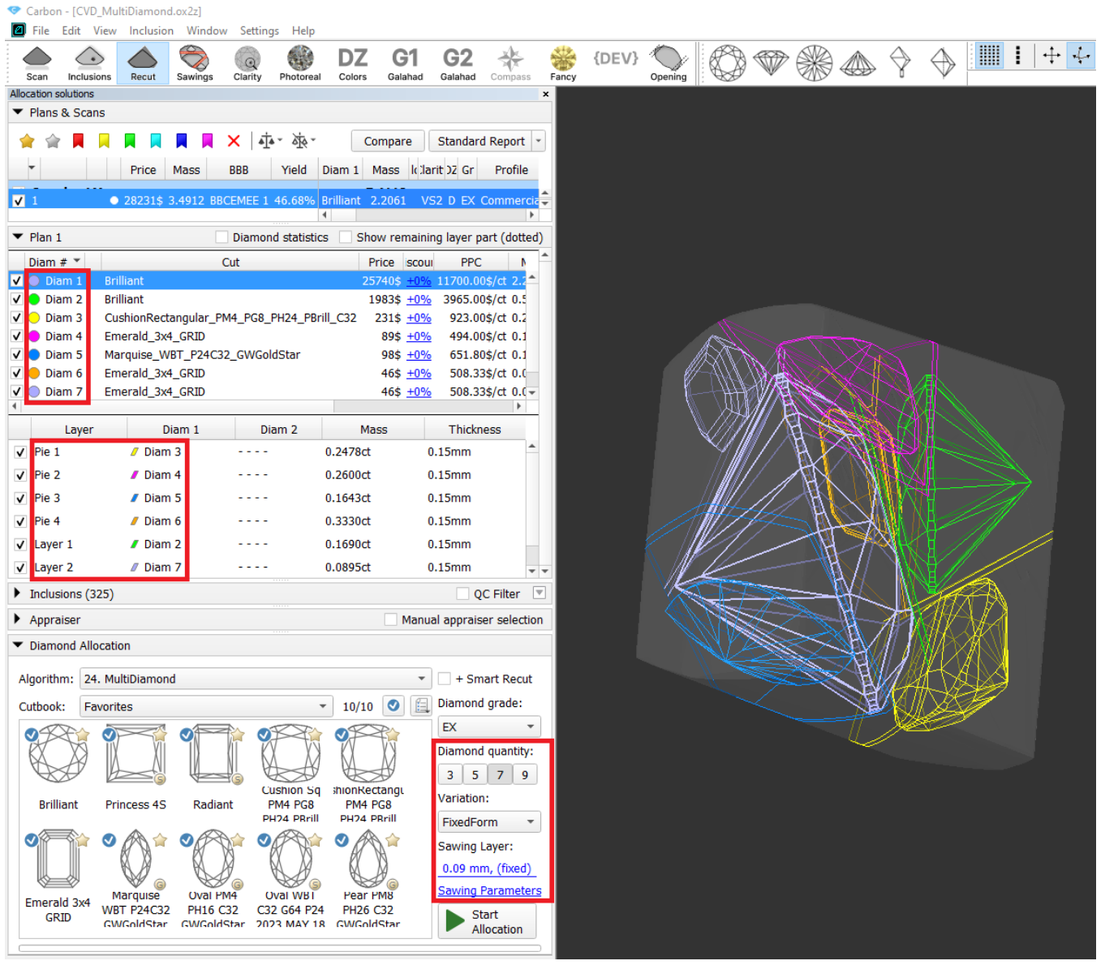
The picture shows an example that cannot be sawn:



Introducing the new algorithm 24. MultiDiamond

Solutions generated by the 24. MultiDiamond algorithm can always be sawn, and we provide a sequence of sawing layers and pies to guide this process.

Users can specify the desired number of diamonds in a solution, and the algorithm will allocate that exact quantity of diamonds in the scan model.
When searching for the 3 (three) largest diamonds, the algorithm prioritizes maximizing price. From 4 (four) diamonds onwards, the algorithm also considers the need for existing sawing.

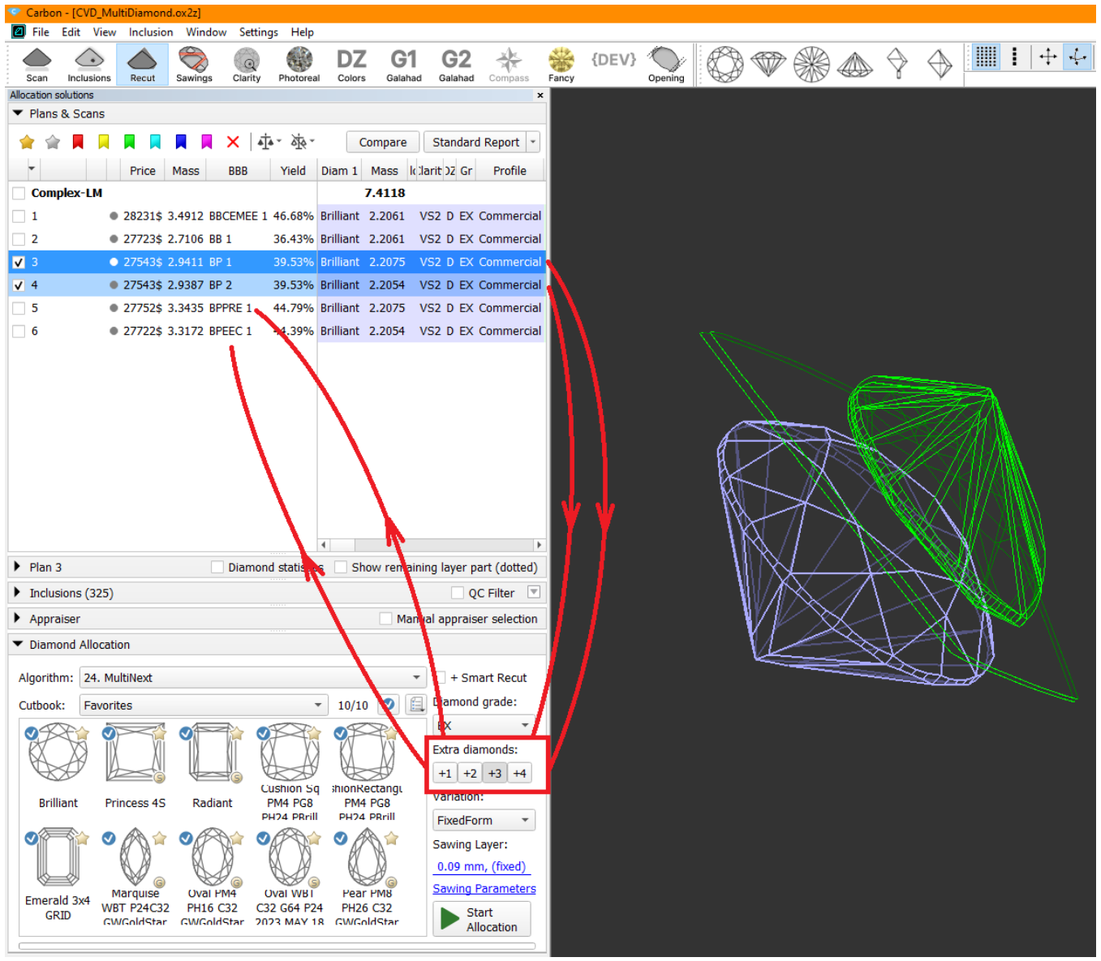


Furthermore, users can adjust the thickness of sawing planes used in the optimization process, and choose the **Variation** mode. Currently, two options are available:

- **FixedForm** to produce solutions exactly of the same form as the allocation forms registered within the cut. Only scale or position may be changed;
- **FlexibleForm** to produce solutions in the limits specified by the appraiser.

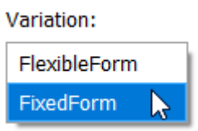
24. MultiNext

The algorithm **24. MultiNext** has also been added. It operates on one or multiple selected solutions. The user chooses how many extra diamonds need to be added to the selected solutions. In the case of multiple selected solutions, the algorithm will work independently and in parallel on each of them. **24. MultiNext** algorithm use s an allocation method identical to **24. MultiDiamond**" starting from third solutions. The result of **24. MultiNext** can always be sawn with pie sawing.



The **24. MultiNext** algorithm (similar to described above 24. MultiDiamond algorithm) provides two options in the **Variation** dropdown menu:

- **FixedForm** to produce solutions exactly of the same form as the allocation forms registered within the cut. Only scale or position may be changed;
- **FlexibleForm** to produce solutions in the limits specified by the appraiser.



Compared to th previously released 24. MultiNext (FixedForm, BasicSawing) algorithm in HPCarbon version 2.0.9, the new **24. MultiNext** algorithm with chosen **FixedForm** option:

- Is faster;
- In most cases provides higher solution price;
- Creates solutions that frequently cannot be sawn without using Pie Sawing.

25. Semicut (final) algorithm

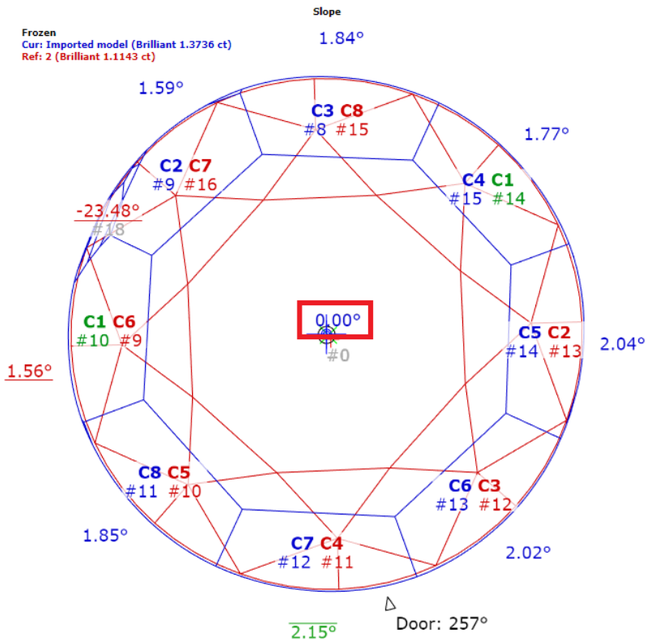
Video | Algorithm 25. Semicut (final)				
Published:	2025, August 28	**Last Updated:**	2025, August 28	**v.1.0**

Your browser does not support the HTML5 video element
Video summary: Introducing the updated algorithm: "25. Semicut (final)". This method is used for semipolished stones to ensure that the solution maintains the Table normal of the scanned model. This allows for the cutting of other facets without altering the Table facet angle.
Video keywords: allocation, table match, Semicut (final), planning, preforms

Data	Sample_diamond_Semicut_final.ox2z	
Published in:	**Release Notes**	2025-12-11 - HP Carbon 3.0.3
	Documentation	NA
	Playlists	NA
	Also	As Separate Page | On YouTube | Specification

Introducing the updated algorithm **25. Semicut (final)**.

This method is used for semipolished stones to ensure that the solution maintains the Table normal of the scanned model. This allows for the cutting of other facets without altering the Table facet angle.



Key advantages over the **06. Semicut (final)** algorithm:

1. It uses preforms to increase the solution's weight.
2. It features improved adjustment of the solution's rotation around the Table normal to find the optimal weight.
3. It is built on the 23. Single algorithm and incorporates all its modern features.

On semipolished stones with a defined Table facet and girdle, 25. Semicut (final) with the Brilliant cut shows an average improvement of 0.5% in mass and 1% in price compared to 06. Semicut (final). The average processing time with one cut is approximately 3 seconds.

25. Chess algorithm

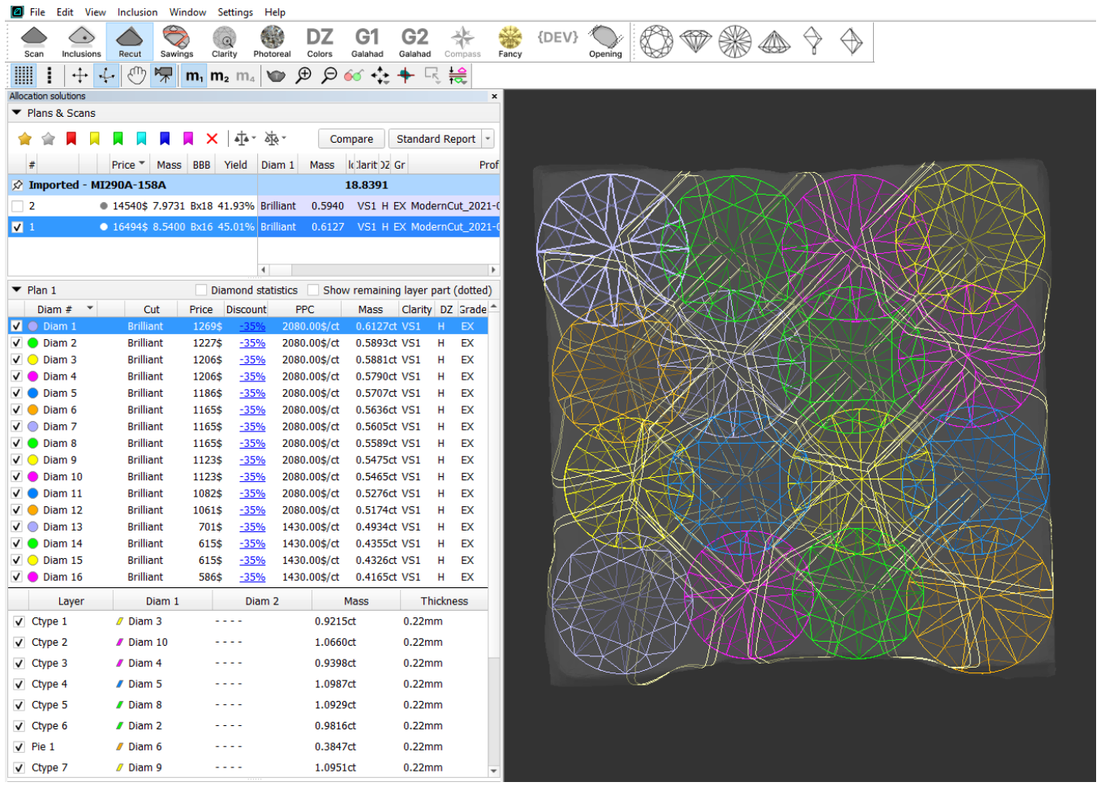
Multi-diamond optimization algorithms primarily operate on a greedy principle. Each subsequent diamond tries to maximize its own volume, paying little attention to the space it leaves for the others. This greed can lead to inefficient use of the original rough's space. While various balancing techniques exist—where earlier diamonds yield some of their space to later ones to increase the total value—the problem becomes intractable within a reasonable time as the number of diamonds increases and the rough becomes more complex due to cavities and inclusions. This forces a reliance on the initial luck of the greedy approach.

With CVD diamonds, however, it is possible to grow diamonds of a standardized shape — wide plates with a relatively low height. Furthermore, the number of inclusions decreases every year, and they are mostly located near the edges, which simply reduces the usable plate size without affecting this shape uniformity.

This standardization of the input data allowed us to create a new algorithm based on principles from the theory of packing space with identical objects.

Introducing the 25. Chess algorithm.

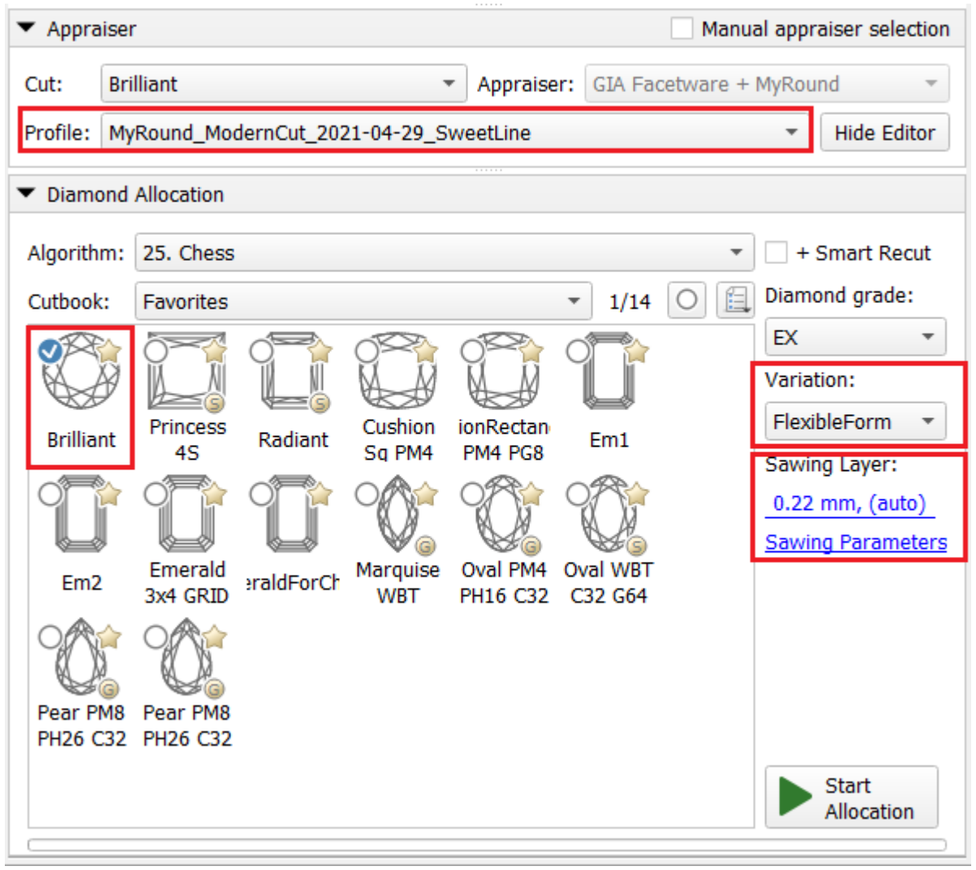
It works by first constructing an optimal cutting lattice for the entire volume and then searching for the best diamonds within it, taking into account the specifics of the input model and inclusions.



There is the project for above illustration - Chess_Demo.ox2z

This algorithm is more efficient than greedy methods. And as CVD diamonds become purer over the years, the results of the **25. Chess** algorithm will become increasingly flawless. It also allows for finding multiple diamonds of similar mass from the same rough, which carries additional value.

The algorithm is currently under active development and can be considered a demo version. It fully supports only the Brilliant cut. You can select a different cut, and the algorithm will search for it during the selection phase, but the optimal cutting lattice will still be built for the Brilliant cut. In future updates, we will add full support for other cuts, starting with rectangular StepCuts.



The following settings, which affect all stages of the algorithm, are currently available:

- Cut appraiser and profile
- Sawing thickness
- Variation: FlexibleForm / FixedForm

Batch allocation

Video | Batch allocation				
Published:	2025, June 16	**Last Updated:**	2025, June 16	**v.2.1**
Your browser does not support the HTML5 video element				
Video summary: Batch allocation is a proven method in diamond planning for handling large volumes efficiently. Its effectiveness depends on the power of the underlying algorithms. Carbon now supports batch allocation, offering key advantages: • Uses advanced Carbon cuts with auto-linked appraiser • Supports SmartRecut and other powerful features We plan to enhance this tool further — including clarity variation, algorithm selection per project, and more smart automation.				
Video keywords: batch allocation, algorithms, planning, smart recut				
Data	N/A			
Published in:	**Release Notes**	2025-12-11 - HP Carbon 3.0.3		
	Documentation	NA		
	Playlists	NA		

	Also	As Separate Page | On YouTube | Specification

There is a plan to improve the batch allocation in the next release version and add more flexibility.

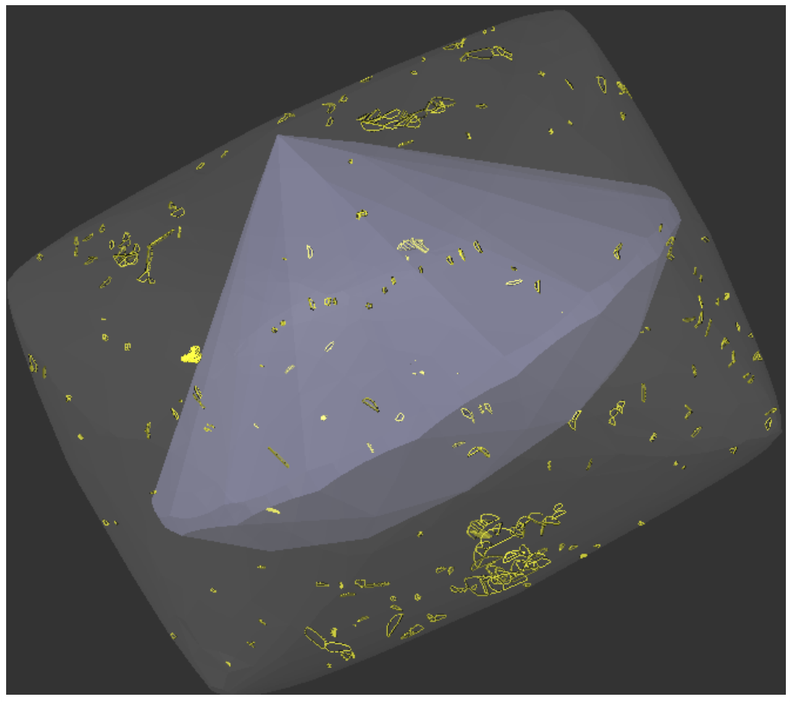
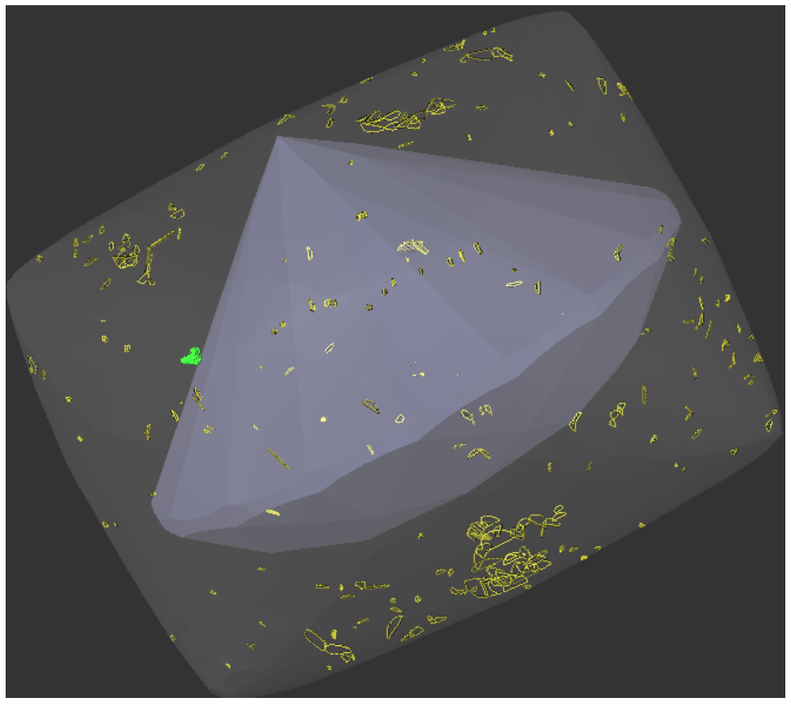
Green inclusions behavior update

Why the change?

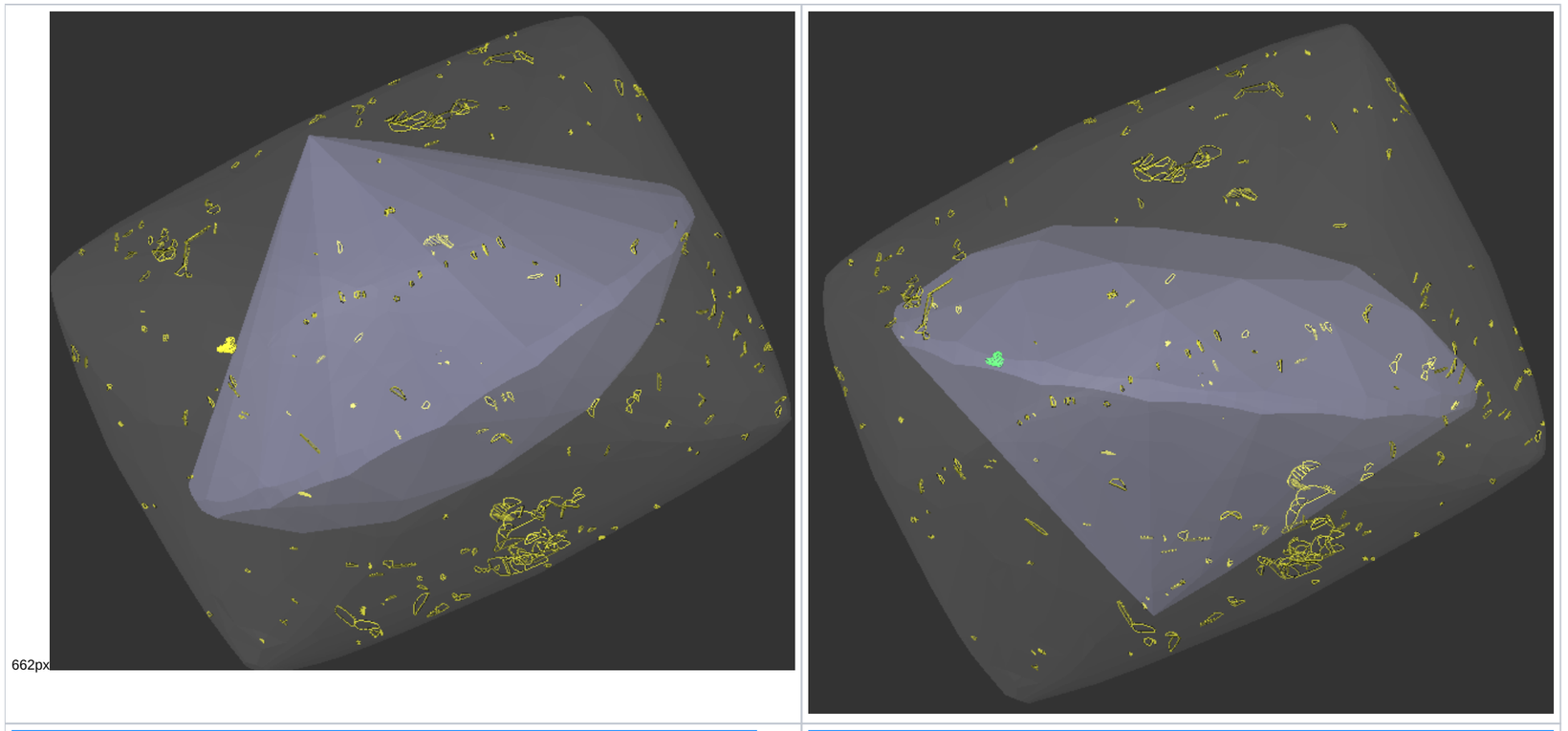
Some customers evaluate results using external price lists that our algorithms cannot access. They need a simpler, faster way to manually guide the allocation algorithms. Specifically, they want direct control over which inclusions are prohibited in solutions and which ones factor into the final price. In earlier versions, users marking inclusions as green expected a maximum-volume solution, ignoring the "permitted green" inclusions. However, the algorithm instead reduced volume to create a cleaner, more expensive result per its built-in pricing.

There is example where the change in behavior of green inclusions is shown obviously:

Carbon3.0.3_GreenInclusions_Demo.ox2z

Before	
Green and Yellow inclusions produces same result	
	
Brilliant 129948$ 5.8837 38.01% VS1 H EX EX EX H&A_5ct+	Brilliant 129948$ 5.8837 38.01% VS1 H EX EX EX H&A_5ct+

Now	
Yellow	**Green. According to user goal**



What's new?

To resolve this and support different users workflows, **we have changed the behavior of green inclusions in the allocation algorithms**. Each Inclusion Color Status now has a unique role and you can choose which inclusion color statuses are convenient for you to use.

Inclusions participate in two important stages:

1. Influences how allocation algorithms find solutions.
2. Determines the final clarity and price of a solution.

Within the allocation algorithms, there are three options for an inclusion:

- **Forbid**: The solution must not contain this inclusion.
- **Ignore**: The solution may contain the inclusion without affecting the forecasted price and the search for the optimal solution. It's treated as non-existent during allocation.
- **Algorithmic choice**: The solution may either contain the inclusion or not. The forecasted clarity and price of a solution candidate change based on the inclusions it contains. The algorithm evaluates and selects solutions using this inclusion-dependent forecasted price.

In the final solution assessment, inclusions can influence in two ways:

- **Ignore**: Does not affect the solution's final clarity or price.
- **Consideration**: If contained, the solution's clarity is downgraded to the inclusion's clarity.

A complete table of properties for each color status in Carbon 2.3.2 is provided below.

Gray	Ignore	Ignore
Green	**Ignore**	Consideration
Yellow	Algorithmic choice	Consideration
Red	Forbid	Consideration

In versions prior to Carbon 2.3.2, green inclusions behaved identically to yellow ones.
If you were satisfied with the old behavior, your new effective color set is Gray, Yellow, and Red. Simply recolor your old green inclusions to yellow.

How it works?

When to use each color status:

Gray: For inclusions you consider physically absent or so insignificant they won't affect the final product price. They have no effect anywhere in the program.

Green: For inclusions you want to ignore during allocation but consider in the final assessment.

- *Use Case 1 (Green-Red workflow)*: Speed up individual allocation runs by removing yellow inclusions. Manually select Green-Red inclusion subsets for sequential global/local allocation runs. While still seeing their impact on final clarity, otherwise, your path is "Gray-Red workflow".
- *Use Case 2 (Custom pricing)*: Force the algorithm to find larger, less clean solutions optimal for your external price list, not Carbon's built-in ones.

Yellow (Trust the Algorithm): The default for optimization. The allocation algorithms decide to include or exclude these inclusions to maximize objective functions like price.

Red: Strictly forbidden from appearing in algorithm-generated solutions. However, manual manipulation may inadvertently leave them inside a solution.

The **Clarity Diversity** parameter relies on the forecasted price during allocation. Therefore, only inclusions that participate in algorithm price forecasting (**Yellow** status) affect Diversity. Gray and Green inclusions are ignored, and Red inclusions are forbidden.

For convenient personalized work with inclusion clarity and color status, we have developed a new interface, which you can read about in the chapter "Batch Operations Panel for Inclusions".

Allocation - manual tools

Fast Swim

Operators use manual tools during planning after getting the initial solution of global allocation. One of them is a movement of layer and recalculation of diamonds allocation.
This operation is required both for natural rough diamonds and grown CVD diamonds to get symmetrical solutions, or fixed mass solutions (such as 1ct+1ct, 1ct+2ct). Current algorithms may not provide that kind of solution.
However, you can achieve the desired result manually by using the movement panel for the layer and applying the Swim algorithm to each diamond individually. It takes time.

We have developed a mode that eliminates the need for manual use of the Swim algorithm, saving you valuable time.

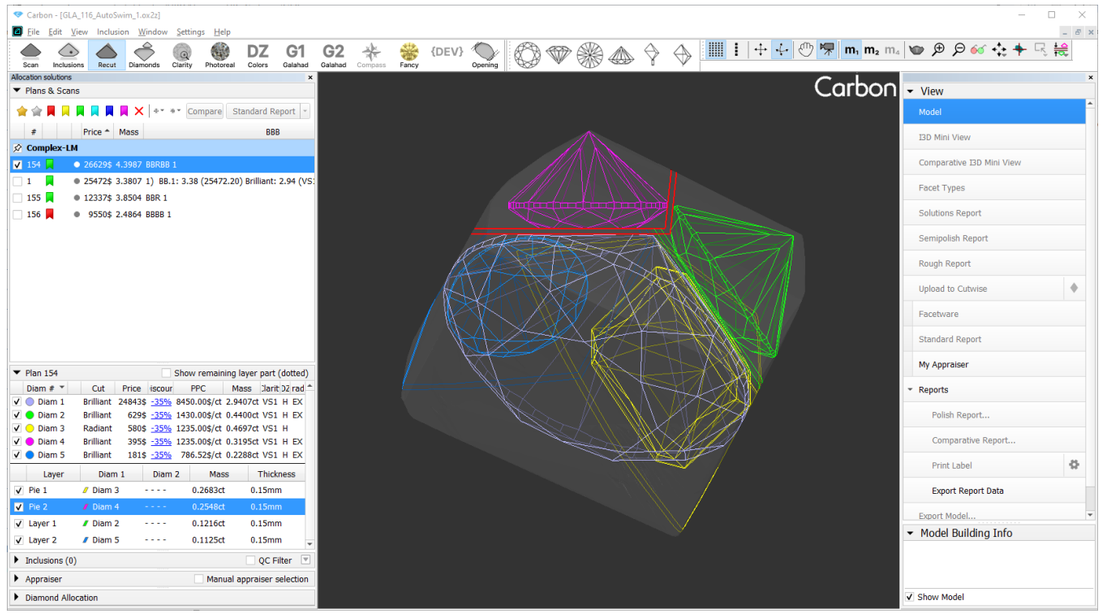
Video | Fast Swim - manual allocation tool by layer or pie movement				
Published:	2024, December 13	**Last Updated:**	2025, June 17	**v.4.5**
Your browser does not support the HTML5 video element				
Video summary: Operators currently use manual tools to adjust diamond allocations for symmetry or fixed mass solutions, which existing algorithms may not provide. A new fast-swim mode has been developed to automate this process, saving time. By selecting this mode, moving a layer or pie automatically adjusts the associated diamonds, displaying brief information and price changes. This resulted in a higher-value solution with two symmetrical 0.5-carat diamonds.				
Video keywords: fast swim, auto-swim, auto swim, swim, layer, pie, movement, adjustment				

Data	Fast_swim_sample.ox2z	
Published in:	**Release Notes**	2025-12-11 - HP Carbon 3.0.3
	Documentation	NA
	Playlists	NA
	Also	As Separate Page | On YouTube | Specification

Support for Solutions with Arbitrary Numbers of Polished Diamonds

The Fast Swim processes solutions containing any number of **polished diamonds**. The order of layers in the solution defines the **working zone** for each polished diamond, where the **Bound Swim** algorithm is executed.

- When the **first layer** is moved, Bound Swim runs for **all polished diamonds** in the solution.
- Typically, each layer isolates one polished diamond from the remaining ones.
- For subsequent planes (second, third, etc.), the working zone remains unchanged for previously isolated polished diamonds, and the algorithm **is not triggered** for them.



Compatibility with Different Section Types (Layer, Pie)

The algorithm now supports **all section types**, including:

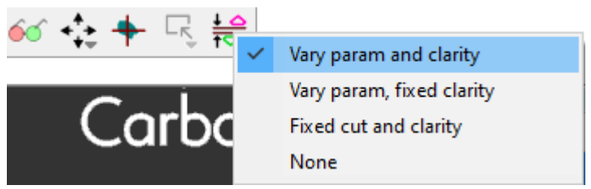
- **Layer**: Traditional planar sections.
- **Pie**: Two planes in one section (newly supported).

Operational Notes:

- Pie sections can only be moved or rotated **as a single unit**.
- Adjustment methods:
    - Direct manipulation in the 3D scene (mouse controls).
    - Precision editing via the **Movement** panel.
- **Restriction**: Angle adjustment between planes within a single Pie section is currently unavailable.

Algorithm Selection Integrated into Main Toolbar

The **Fast Swim algorithm** settings (activated after plane adjustment) are accessible in the main toolbar.

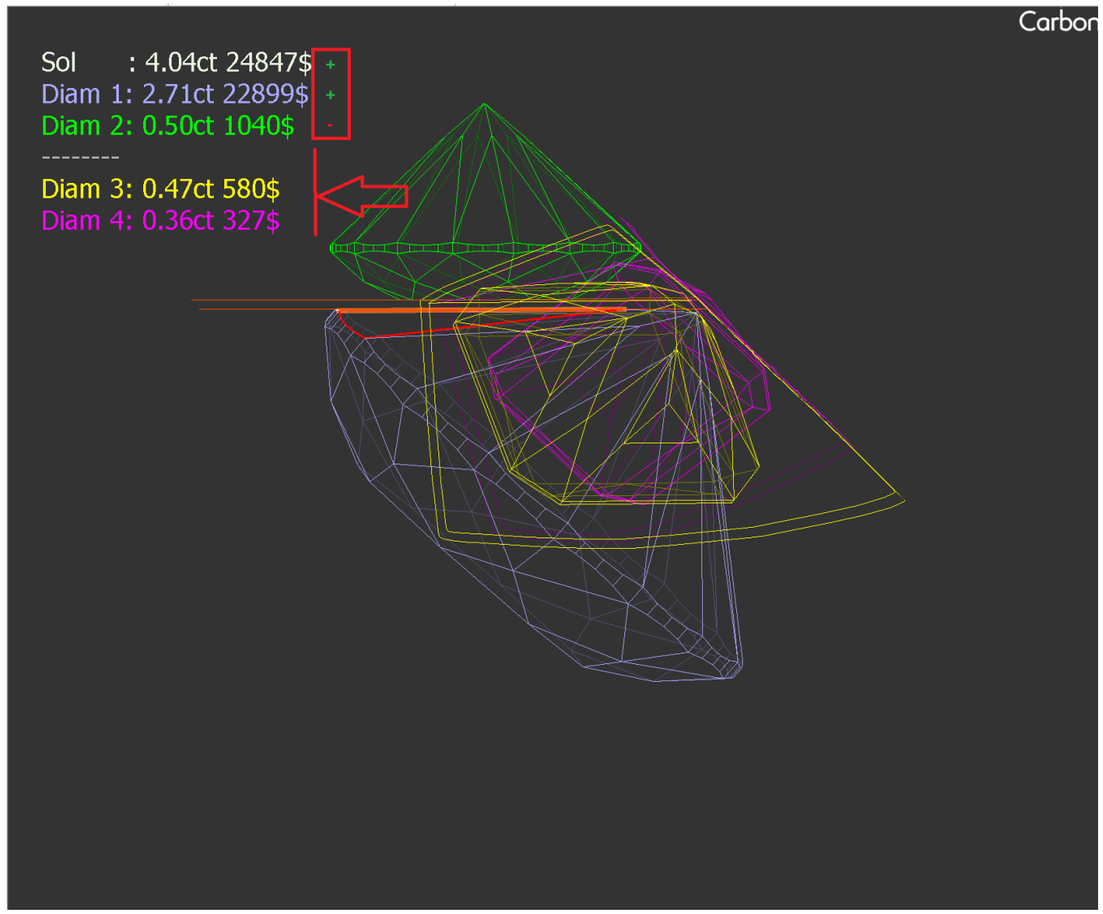


Available modes:

Vary param and clarity	Maximizes solution value by optimizing polished diamond parameters *and* evaluating multiple clarity groups (inclusion sets). Default mode.
Vary param, fixed clarity	Optimizes solutions by adjusting polished diamond parameters *only* (current clarity group remains unchanged).
Fixed cut and clarity	Uses predefined fixed polished diamond parameters and the current clarity group.
None	No automatic optimization after plane movement.

Detailed solution information in the Scene

- In **Fast Swim**, extended solution details have been moved to the **top-left corner**.
- Price changes for diamonds and the solution itself are now marked with **+/-** signs.
- Below a dotted line in the table, you'll see information about diamonds that cannot be modified when adjusting the current saw.
- This compact summary automatically disappears after 30 seconds.



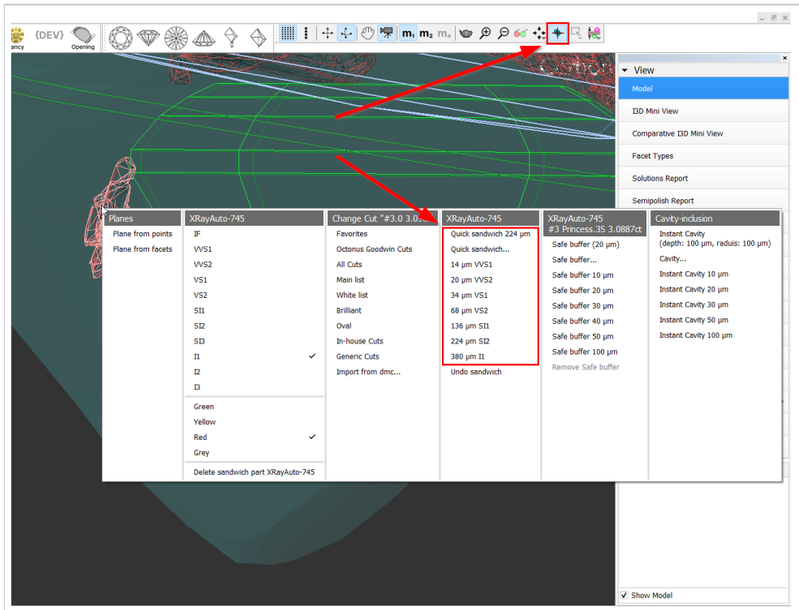
Quick Sandwich tool

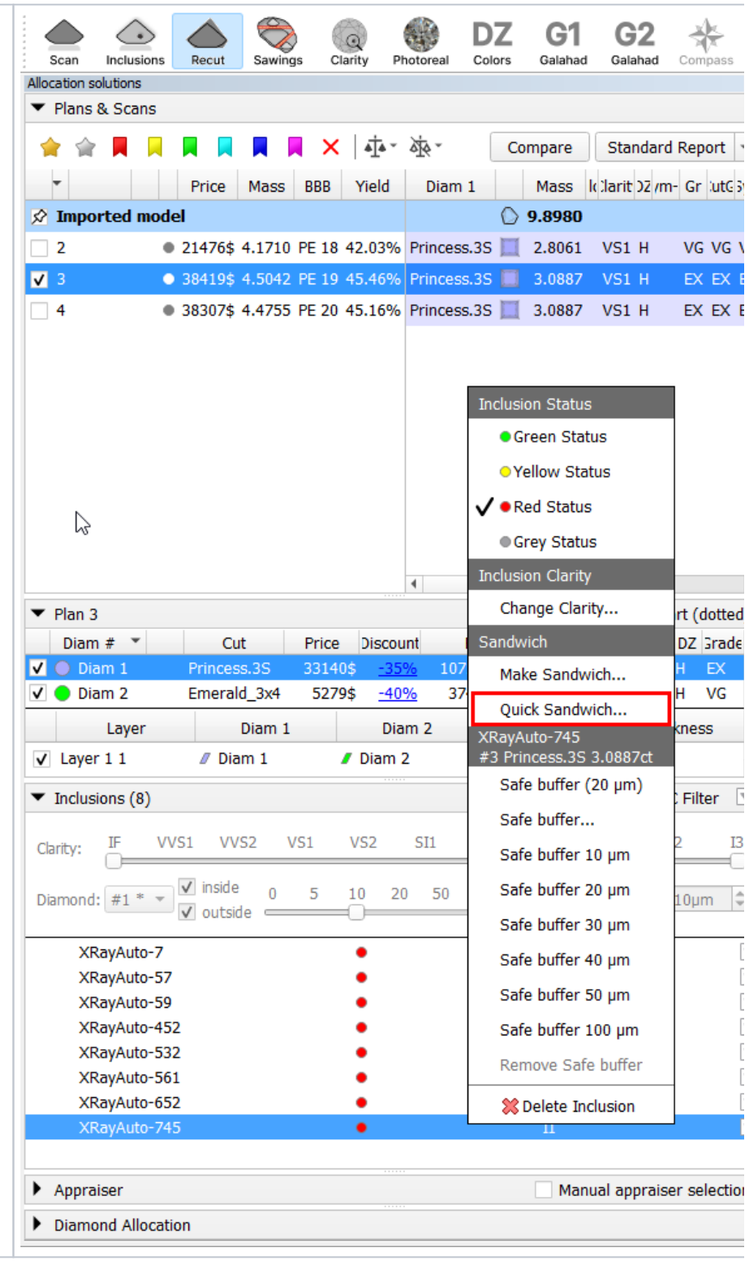
A Quick Sandwich tool has been added, which makes it possible to separate a smaller peace of inclusion. This may increase plan weight with the same clarity.

Video | Quick sandwich - Tool to separate part of inclusion. Episode 2				
Published:	2025, June 11	**Last Updated:**	2025, June 11	**v.1.2**
Your browser does not support the HTML5 video element				
Video summary: A Quick Sandwich tool makes it possible to separate a smaller peace of inclusion. This may increase plan weight with the same clarity.				
Video keywords: quick sandwich, inclusion, planning				
Data	Layers-demo4.ox2z raw_diamond_sample+4b.ox2z			
Published in:	**Release Notes**	2025-12-11 - HP Carbon 3.0.3		
	Documentation	NA		
	Playlists	NA		
	Also	As Separate Page | On YouTube | Specification		

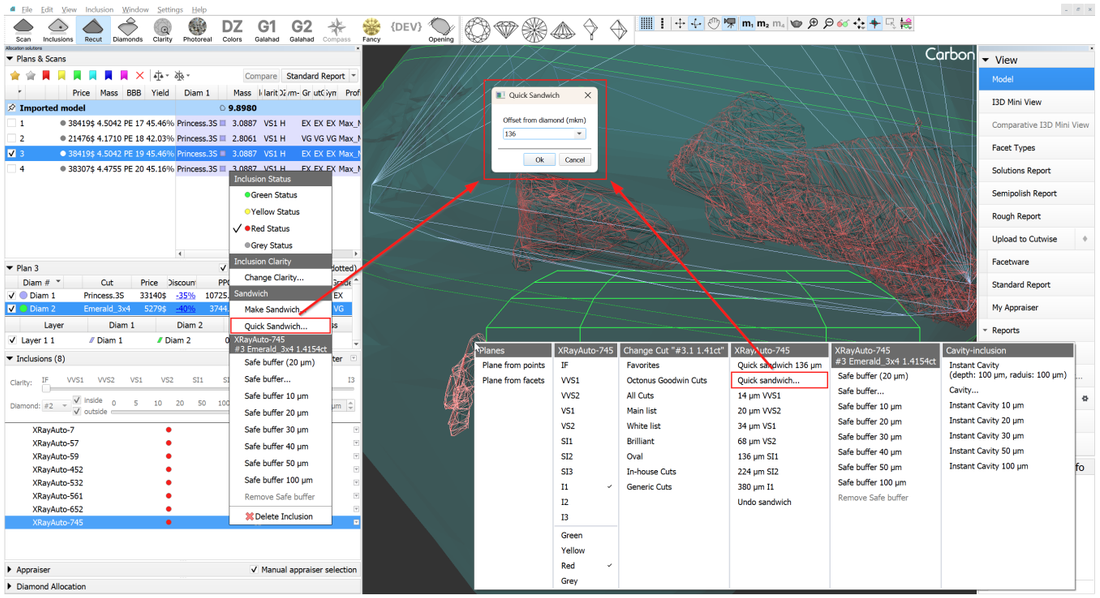
Sequence of actions when working with Quick Sandwich.

1. Creating a sandwich.
A sandwich can be created in two ways:
- Using the context menu in the scene (the selection mode must be activated in the scene for this).
- Using the context menu in the inclusion list.

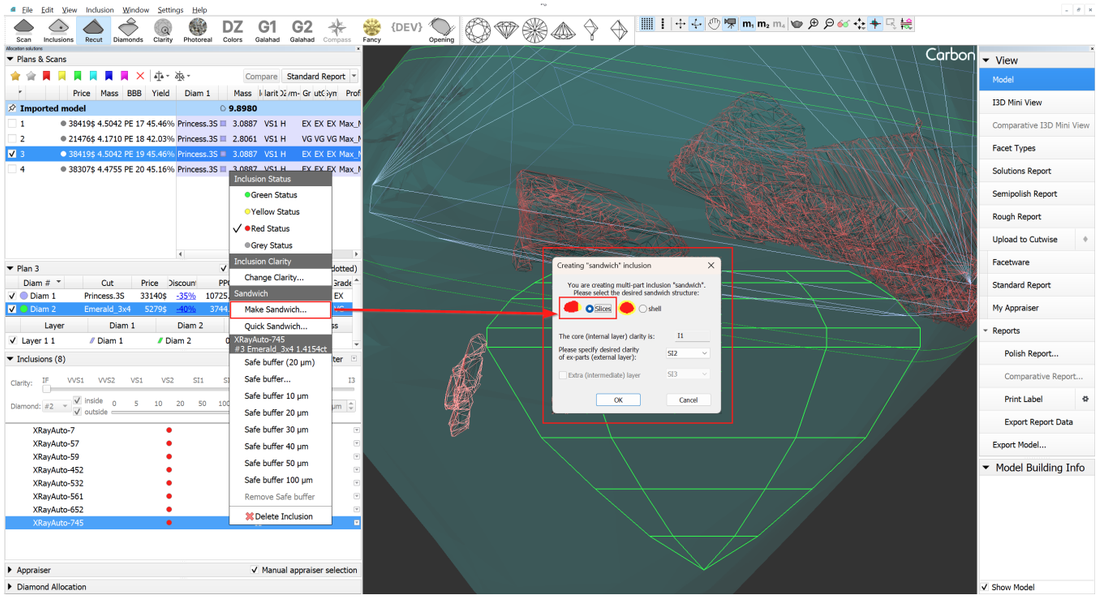




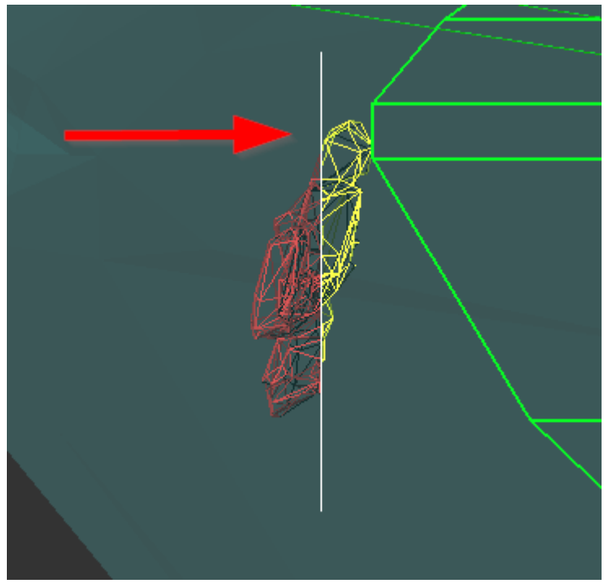
When you select the "Quick sandwich..." menu item, a dialog box will be displayed where you can manually enter the desired offset value.



Quick Sandwich is also now created in the "Creating sandwich inclusion" dialog box.

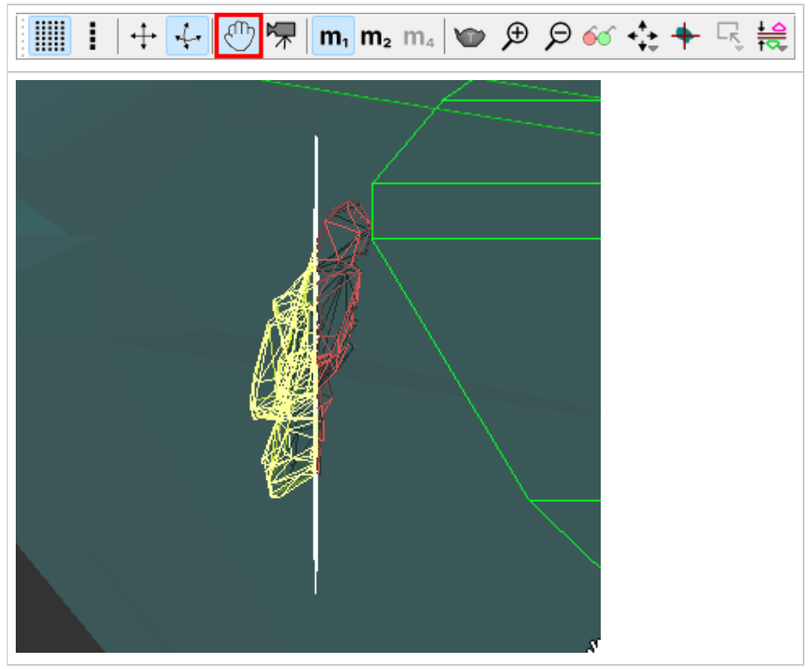


The saw disk of the sandwich will be created relative to the nearest diamond and positioned parallel to its nearest facet at the distance specified during the sandwich creation.

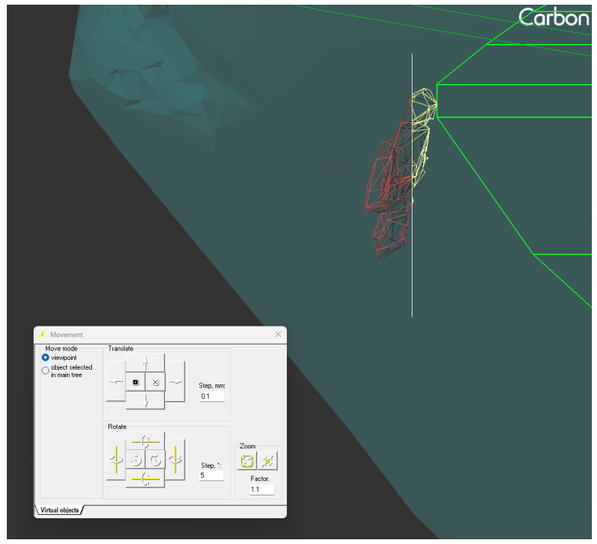


After creation ex-part sandwich becomes active.

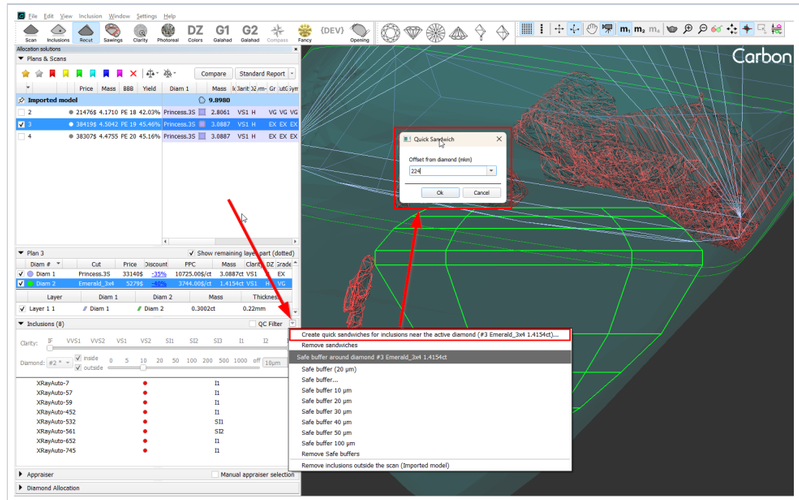
2. If it is necessary to change the position of the saw disk, you need to activate object move mode (hand icon on the toolbar). After that, the saw disk can be moved similarly to other objects in "hand" mode. This means using: Shift for flat-parallel movement, 'v' for rotation around the vertical axis, 'h' for rotation around the horizontal axis, and 'c' for rotation around the axis normal to the scene.

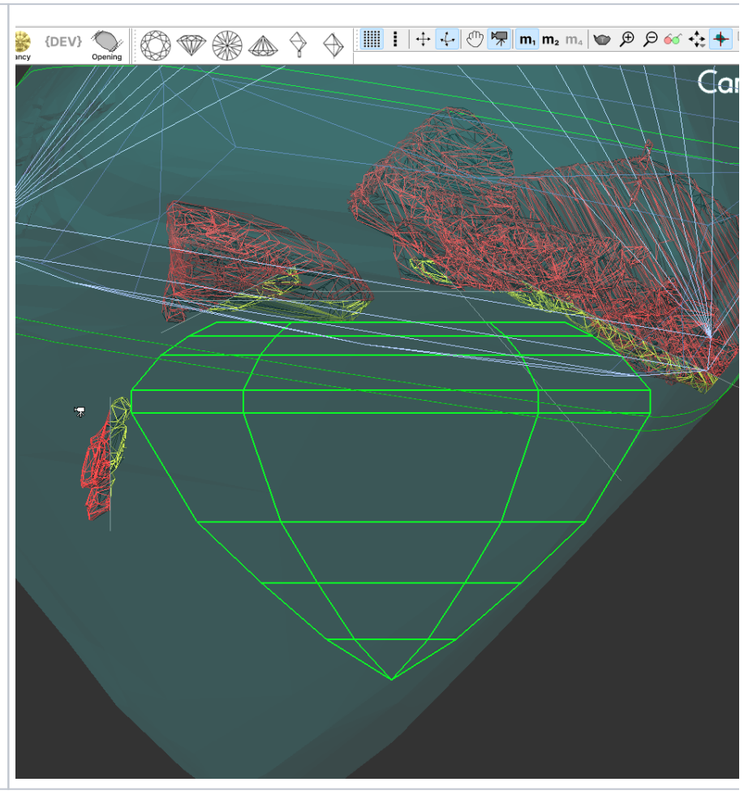


The position of saw disk also could be changes via Movement panel:



3. Additionally, there is an option to apply the Quick Sandwich to all inclusions near the active diamond.





Equal Price Pair (Swim), Twin (Swim), Bound Swim (Vary Forms and Params)

Several new **dialog-based optimization algorithms** have been introduced:

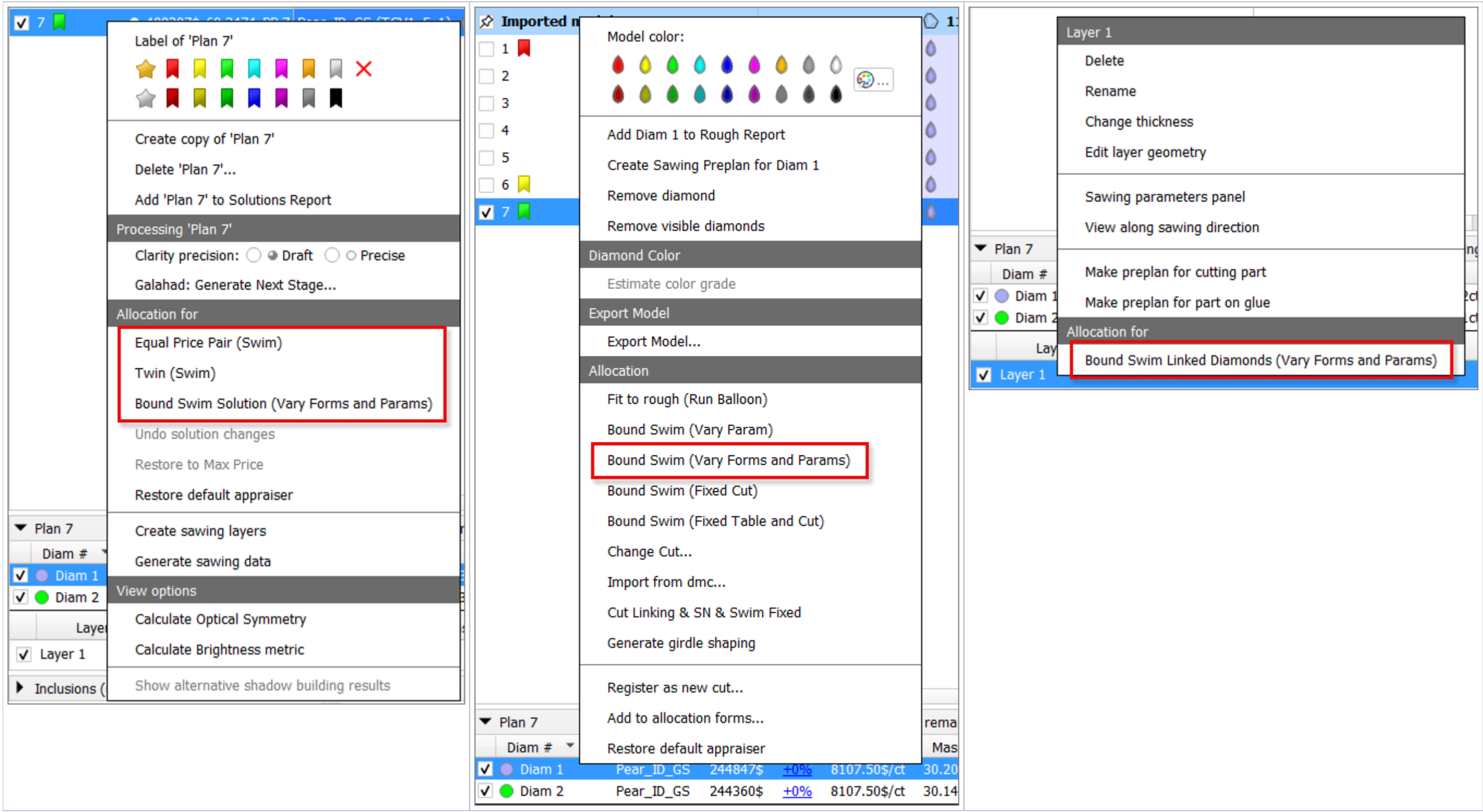
- **Equal Price Pair (Swim)** - tries to adjust the solution so that all diamonds have the same value.
- **Twin (Swim)** - performs everything the *Symmetry Solution* does, but also equalizes the diamonds' parameters.

Diam1	
Diam2	
Project - Example3_TWO_pear-30Ct+_each-W4-test2-UltraSymmetric.ox2z	

- **Bound Swim (Vary Forms and Params)** - an extended version of *Bound Swim (Vary Params)* that additionally iterates through different forms.

These algorithms are available in several places:

- **Equal Price Pair (Swim)** and **Twin (Swim)** - available only in the *solution context menu*.
- **Bound Swim (Vary Forms and Params)** - available in three locations:
  - in the *diamond context menu* - applies to the selected diamond,
  - in the *solution context menu* - applies to all diamonds in the solution,
  - in the *layer context menu* - applies to diamonds linked to that layer.



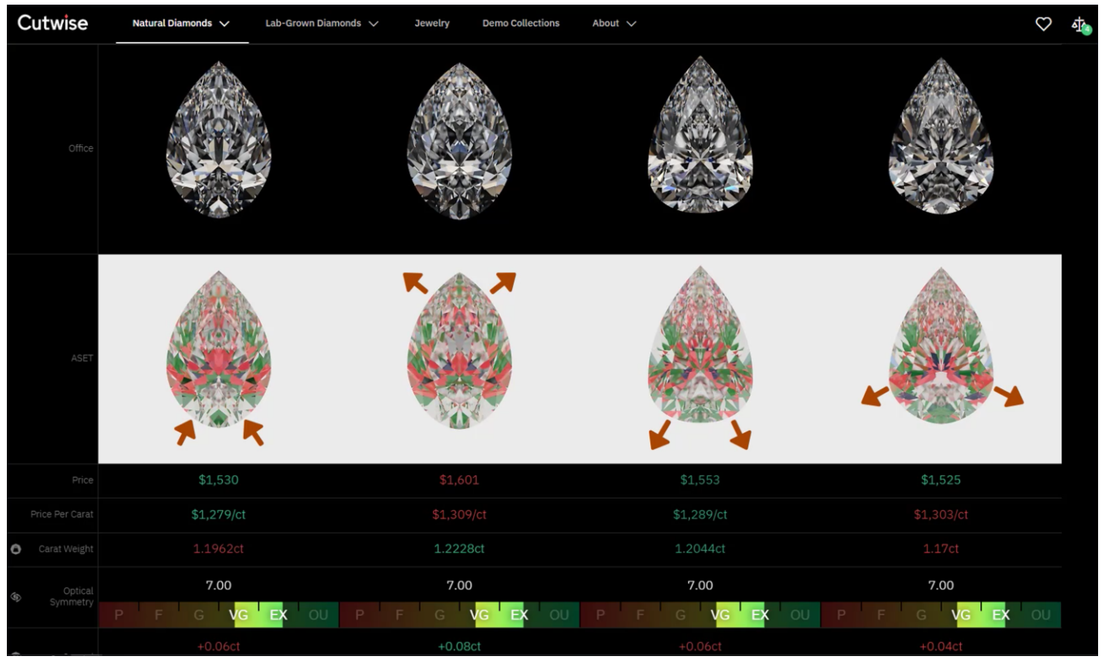
Reports Improvements

Shape Deviation - new parameter

Video | Shape Deviation parameter				
Published:	2024, December 13	**Last Updated:**	2025, June 20	**v.1.8**
Your browser does not support the HTML5 video element				

Video summary: • Introducing the new parameter: "Shape Deviation" • These parameters help to compare how the girdle shape differs from the ideal shape, just like the 2RRoundness parameter does for the Brilliant cut. • Parameter is used in appraisers, reports, SmartRecut, scan reports		
Video keywords: Parameters, girdle shape, comparison with ideal shape, quality control, reports		
Data	ShapeDeviation_demo.ox2z ShapeDeviation_scan_demo.ox2z	
Published in:	**Release Notes**	2025-12-11 - HP Carbon 3.0.3
	Documentation	N/A
	Playlists	N/A
	Also	As Separate Page | On YouTube | Specification

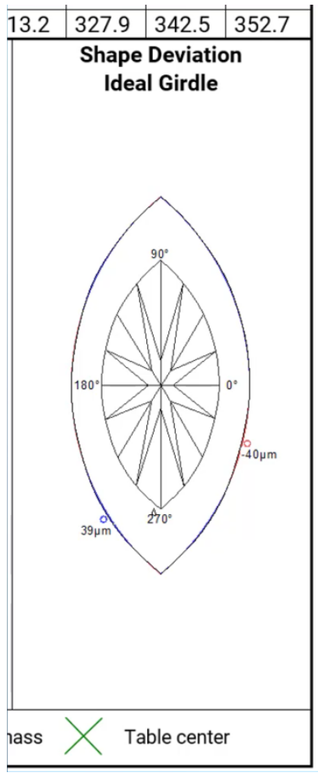
The realization of an unattractive girdle shape in a Fancy diamond often comes too late, after the stone has been cut and fails to attract buyers. Operators aiming to increase carat weight may enlarge the girdle shape without having the necessary knowledge and tools to assess its beauty.

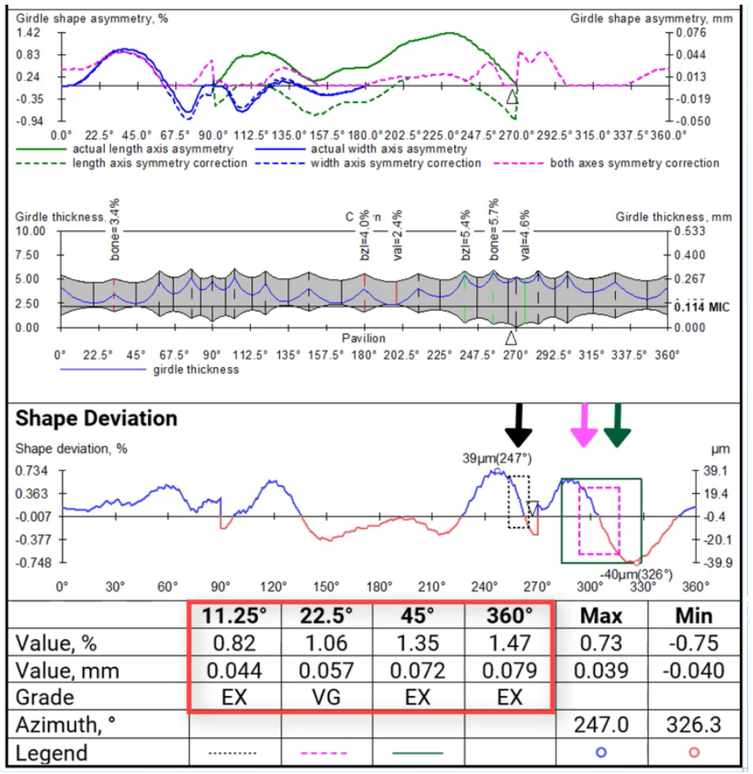


To address this issue, we have developed the Shape Deviation parameters. These parameters help to compare how the girdle shape differs from the ideal shape, just like the 2RRoundness parameter does for the Brilliant cut. The Shape Deviation Grade enables operators to easily reject unacceptable girdle shapes.

What is Shape Deviation?

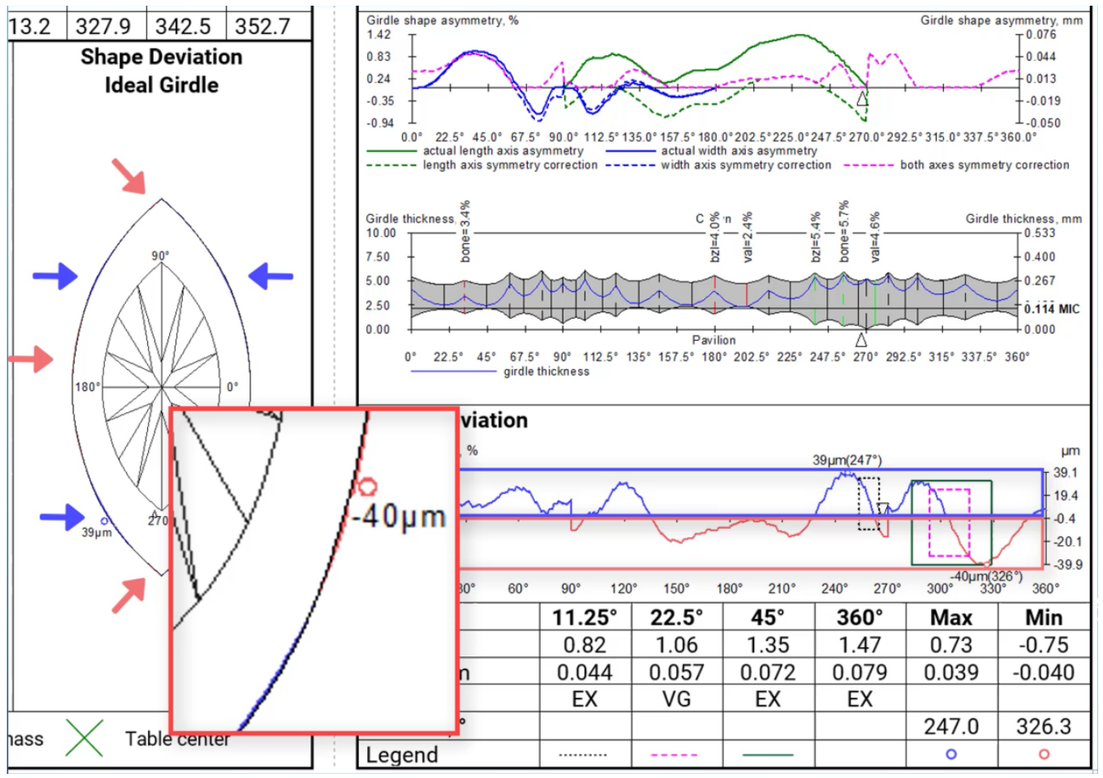
After aligning the girdle shape of the current model with the ideal girdle shape linked to the current cut, we calculate the distances between the two curves. These distances are presented as the Shape Deviation Plot and Shape Deviation Ideal Girdle. Next, we identify azimuth intervals of 11.25, 22.5, 45, and 360 degrees where maximum difference in distances between shapes are observed, and estimate these values. It is in these locations where the imperfections in the girdle shape are most noticeable. The Shape Deviation Plot highlights these areas with rectangular windows, along with indications of global maximum and minimum values.



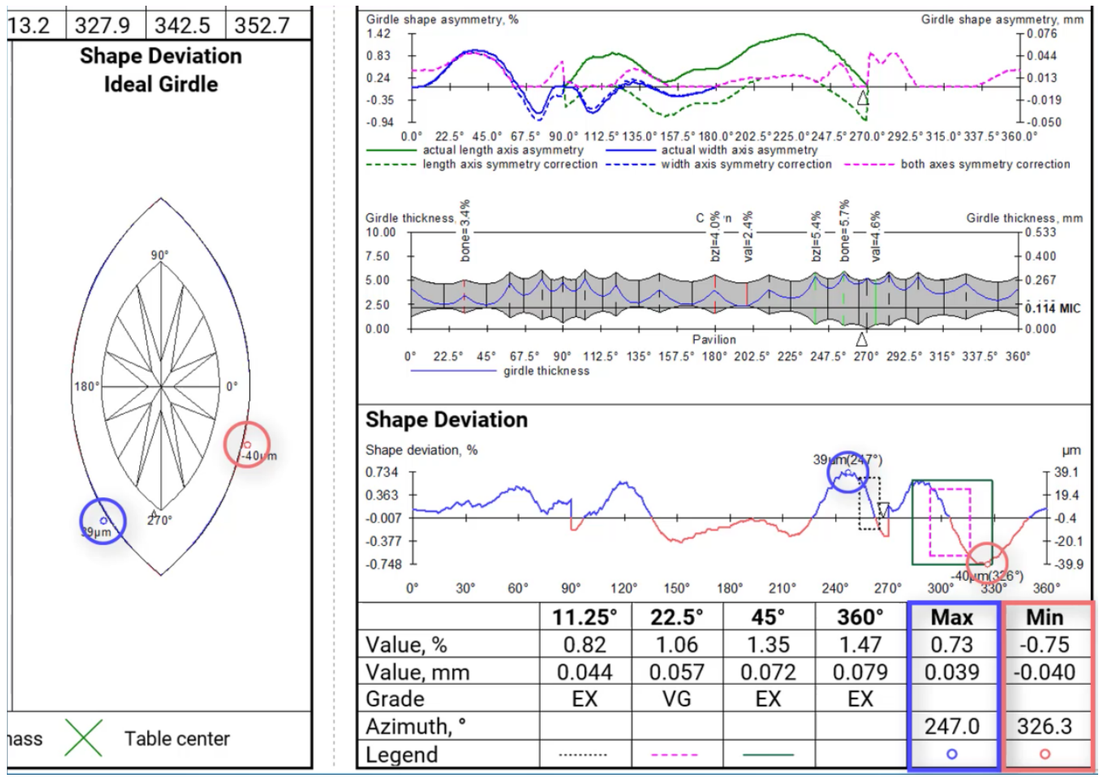


	11.25°	22.5°	45°	360°	Max	Min
Value, %	0.82	1.06	1.35	1.47	0.73	-0.75
Value, mm	0.044	0.057	0.072	0.079	0.039	-0.040
Grade	EX	VG	EX	EX		
Azimuth, °					247.0	326.3
Legend	.....	- - - -	———		○	○

Deviations where the current girdle shape is wider or narrower than the ideal shape are color-coded. This information is also depicted in the Shape Deviation Ideal Girdle image. Here, the current model is outlined in black, with areas highlighted in blue and red denoting the extent to which the girdle shape of the current cut deviates in width from the ideal girdle.



Global maximum and minimum values are also represented in both pictures.



	11.25°	22.5°	45°	360°	Max	Min
Value, %	0.82	1.06	1.35	1.47	0.73	-0.75
Value, mm	0.044	0.057	0.072	0.079	0.039	-0.040
Grade	EX	VG	EX	EX		
Azimuth, °					247.0	326.3
Legend	.....	- - -	———		○	○

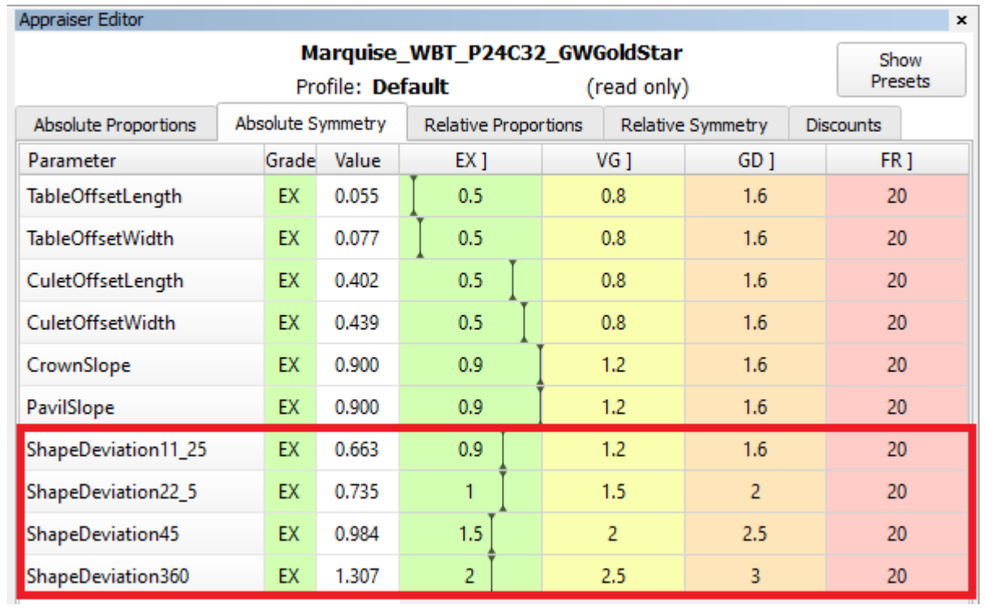
Shape Deviation in appraisers

The parameter is currently available for the following Octonus cuts:

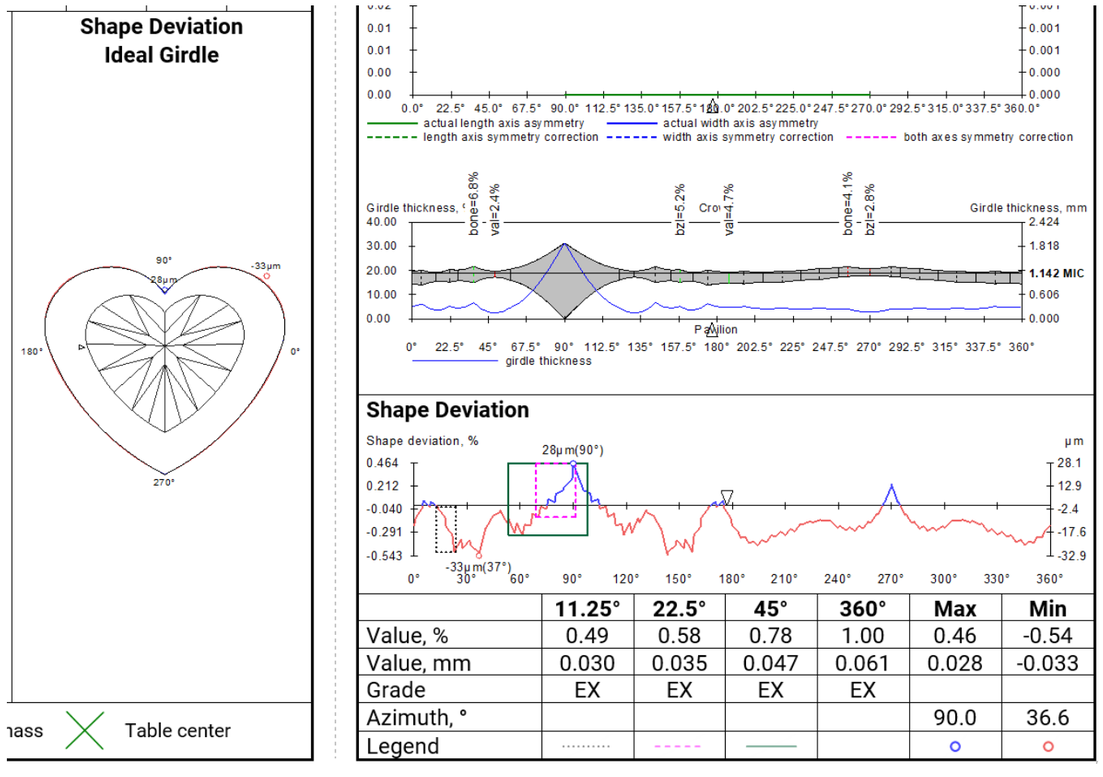
- Pear_wBT.P24C32
- Pear_PM8_PH26_C32_GWGoldStar
- Marquise_WBT_P24C32_GWGoldStar
- Oval_PM4_PH16_C32_GWGoldStar
- Oval_WBT_PM8_PH16_C32_GWGoldStar
- Heart_PM8_PH18_C35_GWGoldStar

We use classic shapes with different Girdle Ratios as shape references for these cuts. The classic marquise shape consists of two circle arcs. The classic pear shape consists of three circle arcs. The parameter has been integrated into these cuts appraisers in the Absolute Symmetry tab.

In the reports an ideal ellipse is used as a reference for any uts recognized as oval and lacking own reference shapes.



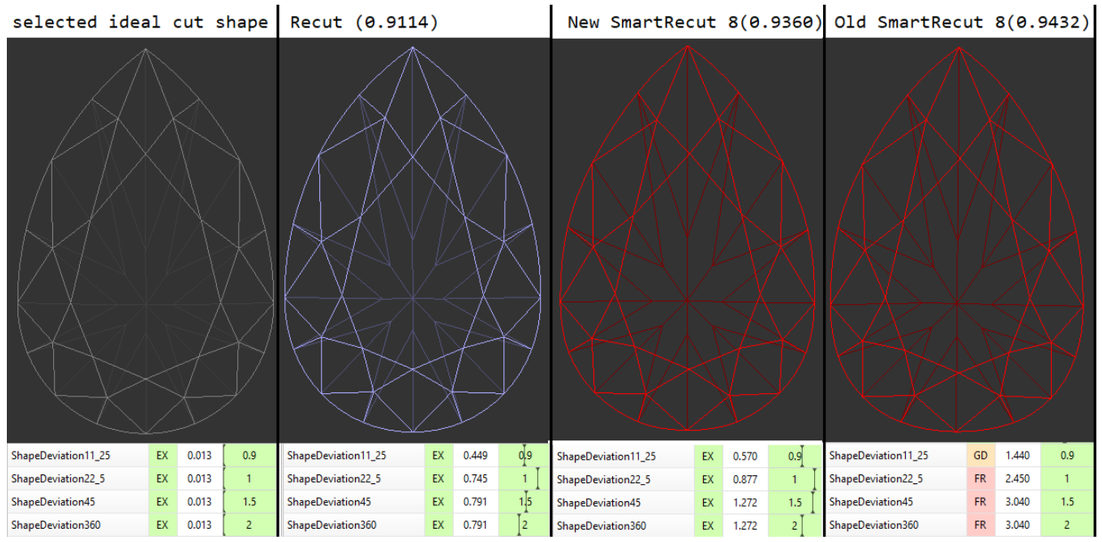
Shape deviation parameter is also available for non-convex shapes (for example, Heart shape):



	11.25°	22.5°	45°	360°	Max	Min
Value, %	0.49	0.58	0.78	1.00	0.46	-0.54
Value, mm	0.030	0.035	0.047	0.061	0.028	-0.033
Grade	EX	EX	EX	EX		
Azimuth, °					90.0	36.6
Legend	·····	- - - -	———		○	○

Shape Deviation in SmartRecut

SmartRecut controls the new parameter if they are present in the appraiser. There is a comparison of SmartRecut solution with and without using this parameter on the picture. It is important to note that this parameter prevents the continuous deterioration of the girdle shape in the SmartRecut on SmartRecut scenario.



Shape Deviation in reports

The parameter has been included into reports:

- RTF Full report for rounded fancies
- RTF Illustrated report for oval and marquise
- RTF Illustrated report for rounded fancies
- RTF Illustrated report for AnyCut
- HTML Illustrated report for oval and marquise
- HTML Illustrated report for rounded fancies
- HTML Illustrated report for AnyCut
- Export Report Data, Color

In the illustrated reports, the Shape Deviation is located in the bottom right corner or in the center:

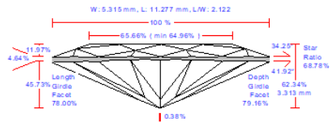
Illustrated report for oval and marquise

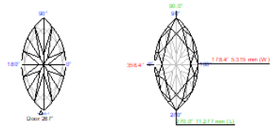
Polished Marquise 18.12.2025

Model	94
Expert name	N/A
Scale weight, ct	N/A
Corrected mass, ct	1.10, 1.1042
Spread	0.32 ct, 22.65%
Extra Facet Girdle / Nat	No

Width	Length	Ratio (L/W)	Diameter Minimum	Diameter Maximum	Total height
5.315 mm	11.277 mm	2.122	5.315 mm	11.277 mm	3.313 mm

Crown height	Pavilion height	Table Widthwise	Culet	Girdle		
				Bezel	Bone	Valley
0.636 mm	2.430 mm	3.452 mm	0.020 mm	0.246 mm	0.235 mm	0.165 mm





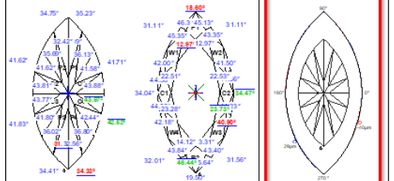
Appraiser title	Marquise_WBT_P24C32_GWGoldStar
Overall cut grade	EX
Symmetry appraiser title	Marquise_WBT_P24C32_GWGoldStar
Overall symmetry grade	EX
Model building info	N/A

Color	
Clarity	
Polish	
Fluorescence	

Parameters	Avg	Min	Max	Dev	Cut Grade	Sym Grade
Diameter, mm		5.315	11.277	5.962	N/A	
Crown Curve angle, °	34.25	34.04	34.47	0.44		
Crown Head angle, °	N/A	N/A	N/A	N/A		
Crown Point angle, °	19.05	18.60	19.50	0.90		
Crown Wing angle, °	31.45	31.11	32.01	0.90		
Crown angle, °	34.25	34.04	34.47	0.44	EX	EX
Crown SilverStar angle, °	N/A	N/A	N/A	N/A	N/A	N/A
Pavilion Curve angle, °	41.92	41.62	42.52	0.90		
Pavilion Head angle, °	N/A	N/A	N/A	N/A		
Pavilion Point angle, °	34.68	34.33	35.23	0.90		
Pavilion Wing angle, °	N/A	N/A	N/A	N/A		
Pavilion angle, °	41.92	41.62	42.52	0.90	EX	EX
Pavilion SilverStar angle, °	N/A	N/A	N/A	N/A	N/A	N/A
Table Widthwise, %	64.96				EX	
Table Lengthwise, %	66.36					
Girdle Bezel, %	4.64	3.55	5.08	1.52	EX	N/A
Girdle Bone, %	4.42	3.60	5.82	2.22		N/A
Girdle Valley, %	3.11	2.09	4.31	2.23	N/A	N/A
Facet Twist, °	9.06	7.99	10.22	2.23		N/A
Star : Upper ratio, %	68.78: 31.22	64.34: 35.66	72.71: 27.29	8.37		N/A
Star angle, °	23.01	22.51	23.73	1.22		N/A
Upper girdle angle, °	43.99	40.90	46.44	5.54		N/A
Lower girdle angle, °	38.59	31.63	43.97	12.34		N/A
Crown height, %	11.97	11.65	12.63	0.98	EX	N/A
Pavilion height, %	45.73	44.64	46.84	2.20		
Total height, %	62.34				EX	
Culet, %	0.38	0.07	0.58	0.51	N/A	N/A

Azimuths, °	1	2	3	4	5	6	7	8
Lower girdle azimuth	6.6	16.8	33.4	40.7	137.4	146.9	164.7	172.8
	186.6	194.5	211.7	224.5	317.4	328.3	344.7	352.0
Star azimuth	11.7	38.3	141.1	167.7	191.7	218.4	321.1	347.7
Upper girdle azimuth	6.0	17.9	32.8	44.8	133.8	148.4	162.2	173.4
	186.0	198.2	211.2	228.2	313.4	328.8	341.5	352.6

Facets angles



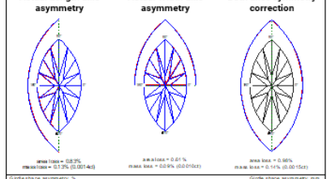
Shape Deviation
Ideal Girdle

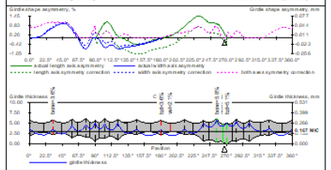
Girdle center | Culet center | Girdle center mass | Table center

1	2	3	4	Offset by table axis		
				Distance	Width wise	Length wise
34.04	34.47	N/A	N/A			
N/A	N/A	N/A		Culet-Table, %		
18.60	19.50			1.04 ± 0.15	0.36	0.97
31.11	31.11	31.56	32.01			
34.04	31.11	18.60	31.11	Girdle-Culet, %		
N/A	N/A	N/A	N/A			
41.71	41.62	41.83	42.52	0.96 ± 0.14	0.44	0.85
N/A	N/A	N/A				
35.23	34.75			Girdle-Table, %		
N/A	N/A	N/A	N/A	0.14 ± 0.11	0.08	0.12
41.71	35.23	34.75	41.62	Girdle to table-culet line offset		
N/A	N/A	N/A	N/A			
				0.19 %, 0.010 mm		

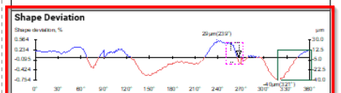
1	2	3	4	5	6	7	8
3.71	4.55	5.03	5.03	3.55	5.07	5.08	5.07
3.60	4.73	4.88	3.60	3.60	5.82	5.47	3.71
2.22	2.46	3.10	3.67	3.72	3.38	2.65	2.09
2.09	2.64	4.18	4.31	4.28	3.76	3.11	2.09
10.22	8.98	7.99	9.04	N/A	N/A	N/A	N/A

Actual Length axis asymmetry | Actual Width axis asymmetry | Both axes symmetry correction





Shape Deviation

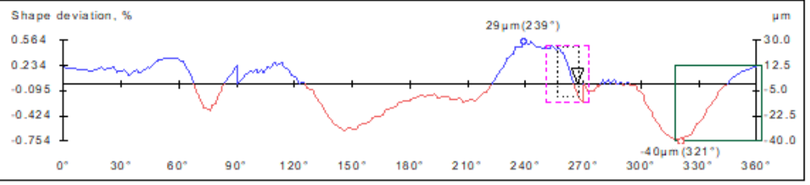


	11.25°	22.5°	45°	360°	Max	Min
Value, %	0.66	0.73	0.98	1.31	0.55	-0.75
Value, mm	0.035	0.039	0.052	0.069	0.029	-0.040
Grade	EX	EX	EX	EX		
Azimuth, °					238.9	320.7
Legend						

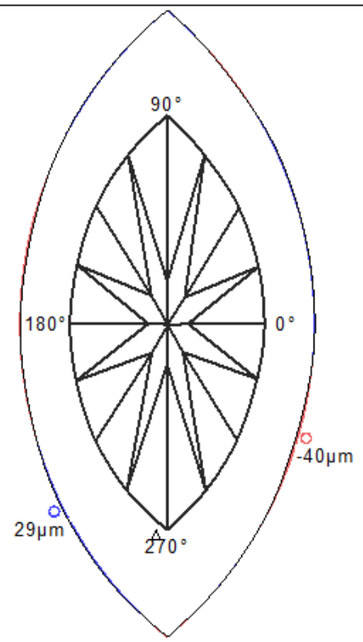
In the full report, this parameter is placed on a separate page.

Girdle Shape		11.25°	22.5°	45°	360°	Max	Min
Value	%	0.66	0.73	0.98	1.31	0.55	-0.75
Value	mm	0.035	0.039	0.052	0.069	0.029	-0.040
Grade		EX	EX	EX	EX		
Azimuth	°					238.9	320.7
Legend		.....	- - - -	———		○	○

Shape Deviation Plot



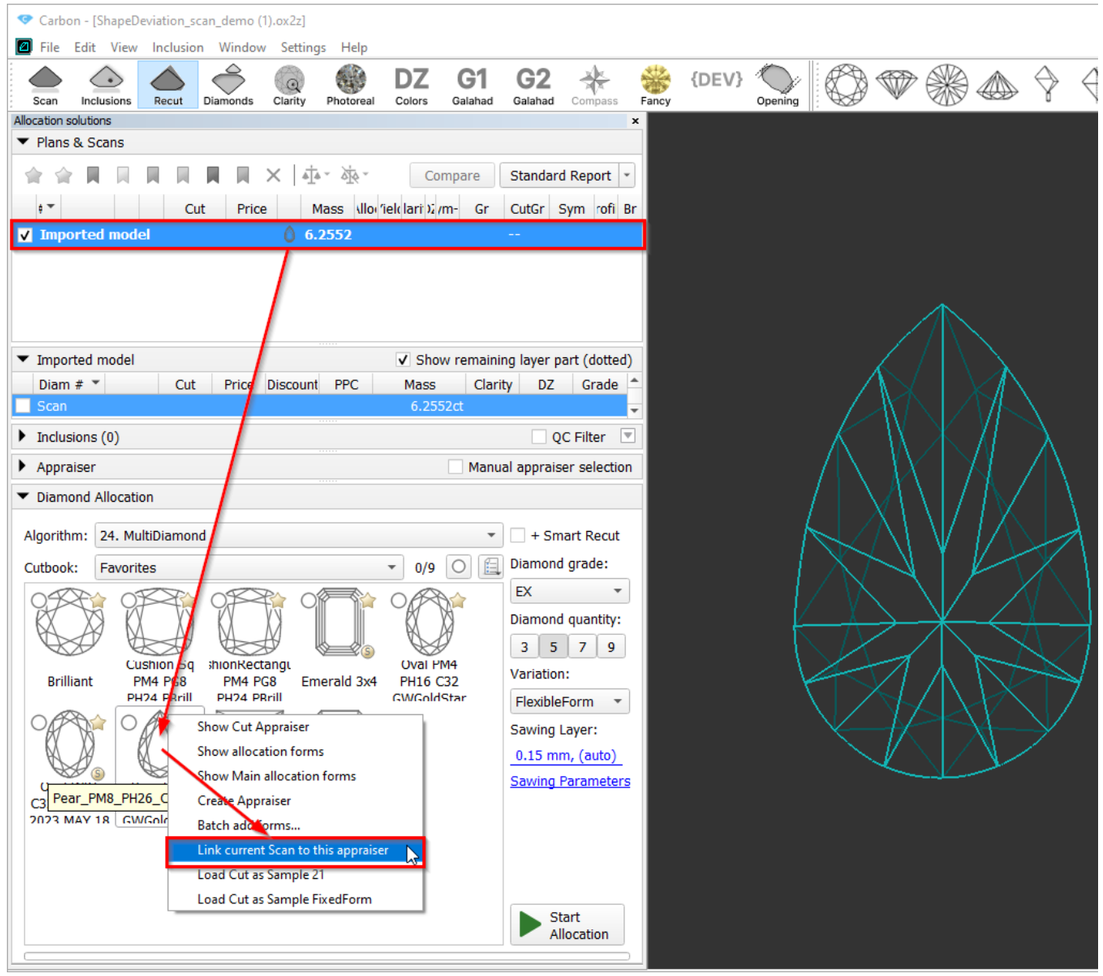
Shape Deviation Ideal Girdle



The description of Shape deviation parameter and corresponding bookmarks are available in Shape Deviation.

Shape Deviation for scans

The Shape Deviation parameter can be utilized not only for solutions but also for scans of finished diamonds. To do this, select the scan, right-click on the **corresponding** cut in the "Cut Book," and choose "Link current scan to this appraiser." The scan can then be evaluated in the Appraiser Editor or Polish Report can be built.



Registration of in-house cuts with ShapeDeviation control

Video | Cut registration with Shape Deviation				
Published:	2025, June 20	**Last Updated:**	2025, August 11	**v.1.3**
Your browser does not support the HTML5 video element				
Video summary: • Agreement between Planning and QC Inspection • New cut registration with Shape Deviation • Article "Which appraiser template to choose?"				
Video keywords: Shape Deviation, girdle shape control, cut registration, Goodwin templates, allocation forms				
Data	N/A			
Published in:	**Release Notes**	2025-12-11 - HP Carbon 3.0.3		
	Documentation	N/A		
	Playlists	N/A		
	Also	As Separate Page | On YouTube | Specification		

Users can register their in-house cuts with ShapeDeviation control using three new templates "Goodwin_GirdleShape_*". Three new templates differ by the number of Gold and Silver Stars in facet types. The first registered form will be used as a reference for the ShapeDeviation parameter. Take care in selecting it. For evaluating ShapeDeviation, its Girdle Ratio will be adjusted according to the current solution. In the future, we will enable registering multiple reference shapes and provide tools to assist in selecting reference shapes; ensuring the validity of the user's set of girdle references; creating a girdle reference for the current solution based on the user's multiple references.

One girdle shape reference form does not limit the number of allocation forms. For the best results, Goodwin cuts should have many different high-quality allocation forms.

Which appraiser template to choose?

The green option is recommended for rounded fancy cuts. The necessity and usefulness of the green option for step cuts are still under question, so both green and yellow options are possible for them.

AnycutBasic : Goodwin type cuts support AnycutBasic appraiser as well, but with the lack of important advantage of having slope angles in the appraiser.

Goodwin* : The appraiser control Crown and Pavilion Slopes. The selection of the most important cut facets is performed automatically. The only advantage of this type of templates over other options is the 2C3P version, which is well suited for rectangular cushions with a two-tier pavilion.

Goodwin_Starts* : The appraiser control Crown and Pavilion Slopes. The selection of the most important cut facets is done by the user using gold and silver stars. This prevents the desynchronization of values at all stages of the diamond's life cycle.

Goodwin_GirdleShape_Starts* : The appraiser additionally control the Shape Deviation parameter, responsible for the beauty of the girdle shape.

> You can read the full article about choosing an appraiser: **Which appraiser template to choose?**

Add allocation forms with Shape Deviation

Video | Add allocation forms with Shape Deviation				
Published:	2025, June 20	**Last Updated:**	2025, August 14	**v.1.3**

Your browser does not support the HTML5 video element

Video summary:

- Add allocation forms with Shape Deviation block scheme
- We recommend using allocation forms with an EX grade for Shape Deviation
- Transfer allocation forms collection
- Option "Link current Diamond to this appraiser"
- SmartNormalize option “Use ideal girdle shape”

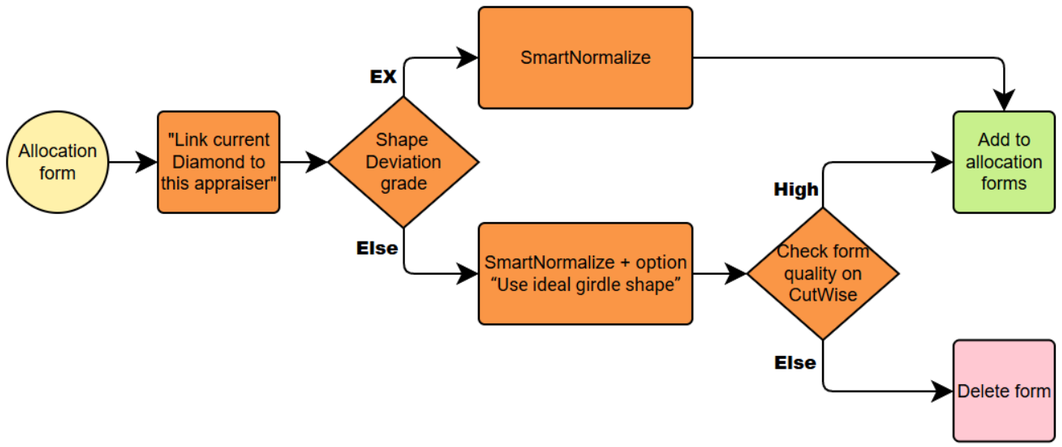
Video keywords: Shape Deviation, girdle shape control, Goodwin, add allocation forms, SmartNormalize, linked appraiser

Data	ShapeDeviation_forms_demo_final.ox2z	
Published in:	**Release Notes**	2025-12-11 - HP Carbon 3.0.3
	Documentation	N/A
	Playlists	N/A
	Also	As Separate Page | On YouTube | Specification

To make the allocation algorithms work correctly, we recommend using allocation forms with an EX grade by Shape Deviation parameter. How to get them? To solve this, we added the option “Use ideal girdle shape” in the SmartNormalize algorithm. How to achieve this? When working with the new cut, you will automatically get EX-grade solutions. The best of these can be normalized and added as forms. But if you've been using our products for a while, you already have a collection of good allocation forms for your cuts. These need to be transferred to the new versions of the cuts registered with the "Goodwin_GirdleShape_*" templates.

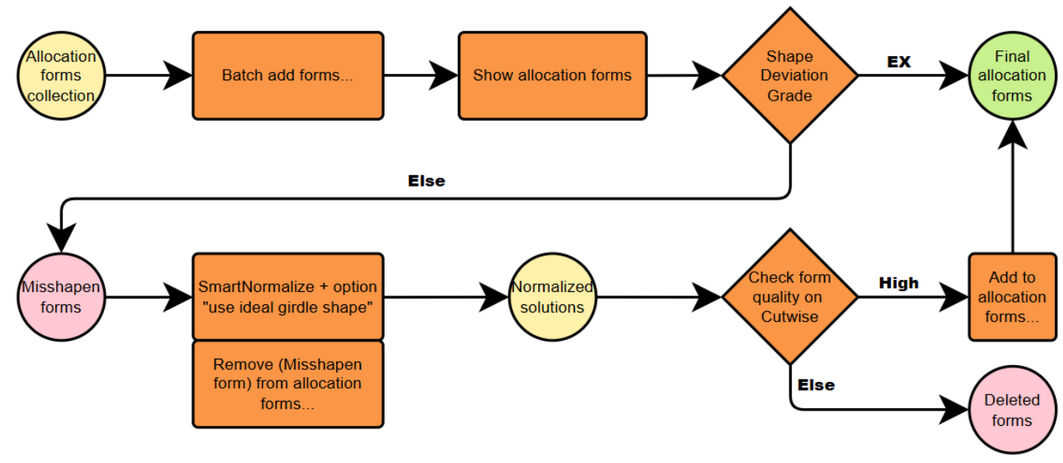
Scheme for one form or solution without Shape Deviation

Your old preforms must be evaluated for Shape Deviation of the new cut using the “Link current Diamond to this appraiser” feature. If the preform has an EX grade by Shape Deviation, you can normalize it as usual with minimal changes and register it in the new cut. If the old preform has not EX Shape Deviation grade, the girdle shape must be corrected using SmartNormalize with the new option “Use ideal girdle shape”. Before registering this form, check in CutWise that the girdle shape change did not harm the optical properties of the preform.



Scheme for many forms transit

If you have many forms in your collection, we recommend using the “Batch Add Forms” command to speed up the process. This command automatically transfers the forms without checking for Shape Deviation. So you’ll only need to fix the “Misshapen Forms”. To view these, use the “Show Allocation Forms” command. Then, apply the previously described procedure to correct Shape Deviation for the “Misshapen Forms”. Finally, don’t forget to remove the “Misshapen Forms” from your new cut, since they have already been added.

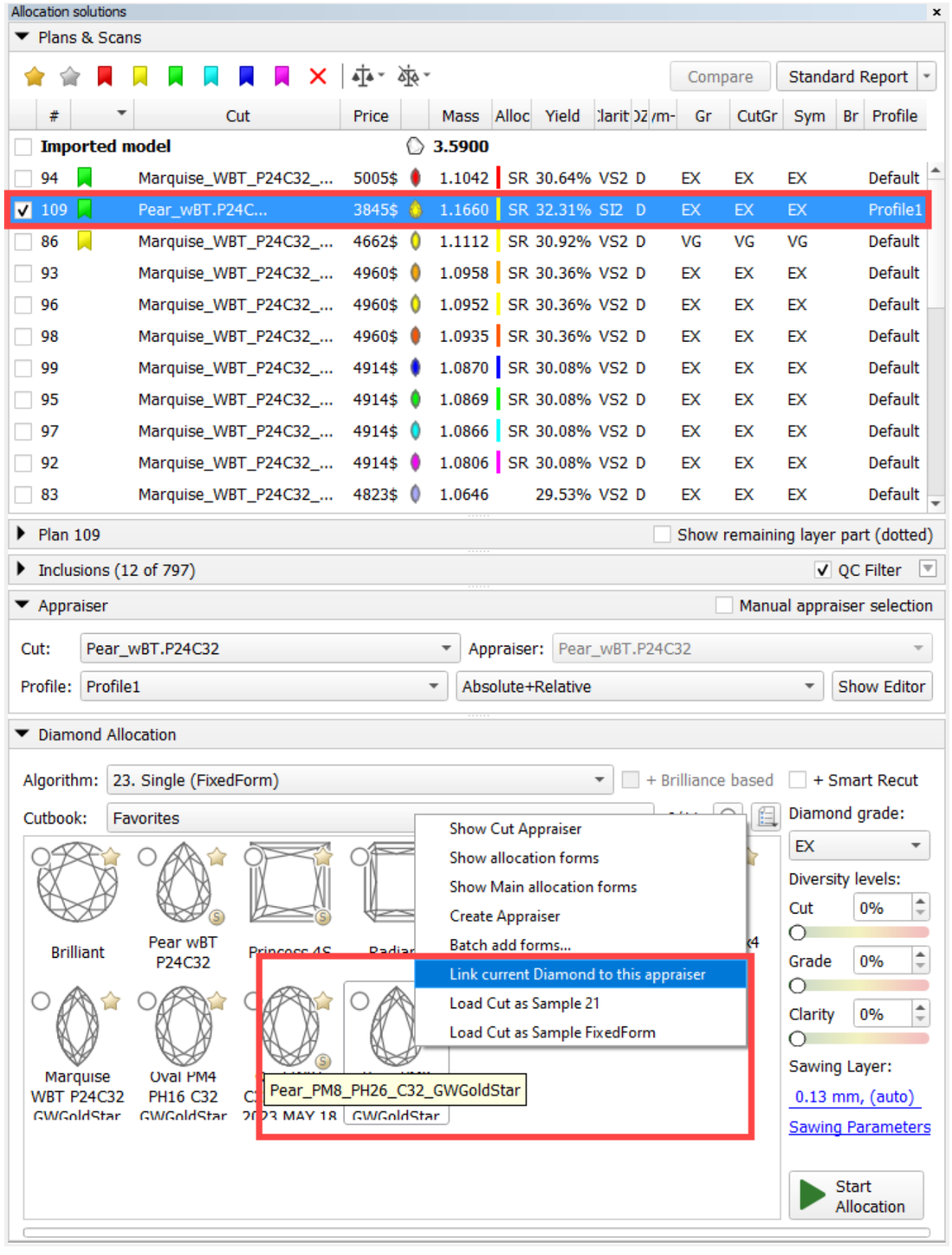


Link current Diamond to this appraiser

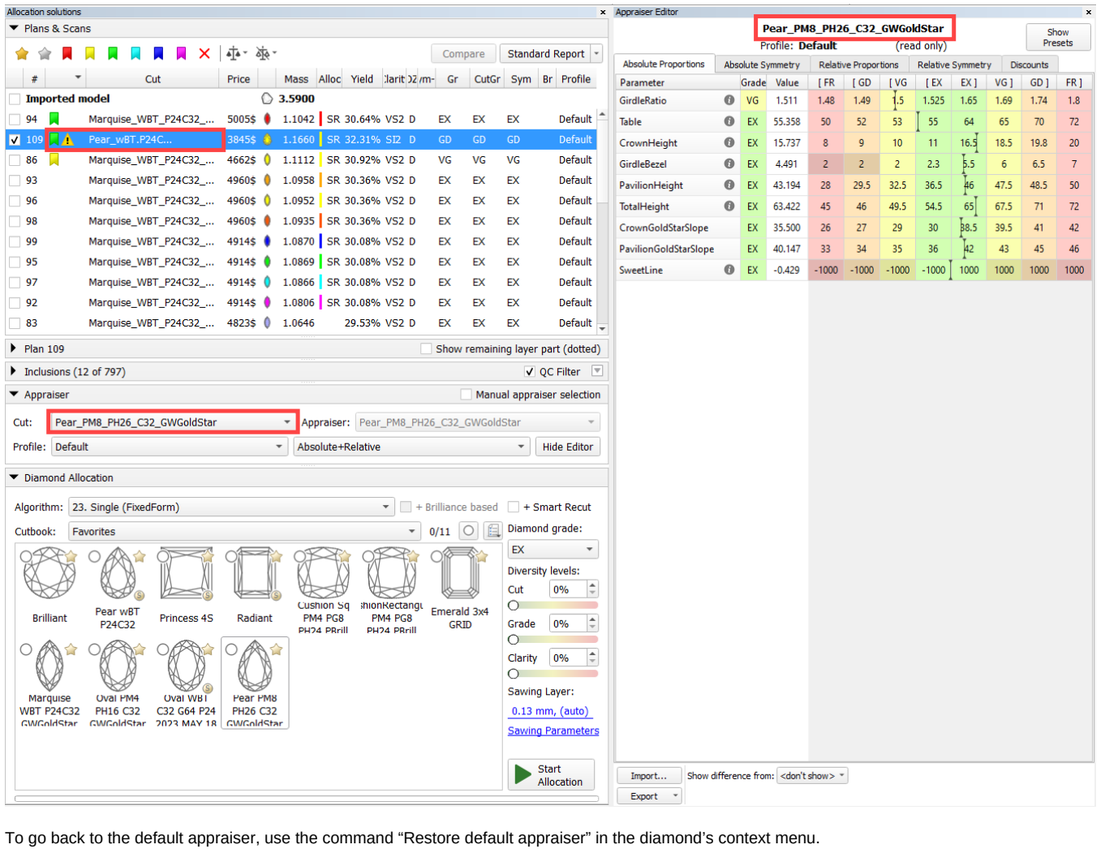
Now you can evaluate your solutions, made by any method, using any appraiser you want. For example, this helps you find shape deviation values based on the ideal girdle shape from another appraiser. This is especially useful if your current solution was made with an old appraiser and will be used as the allocation form for cutting with shape deviation.

How to do it:

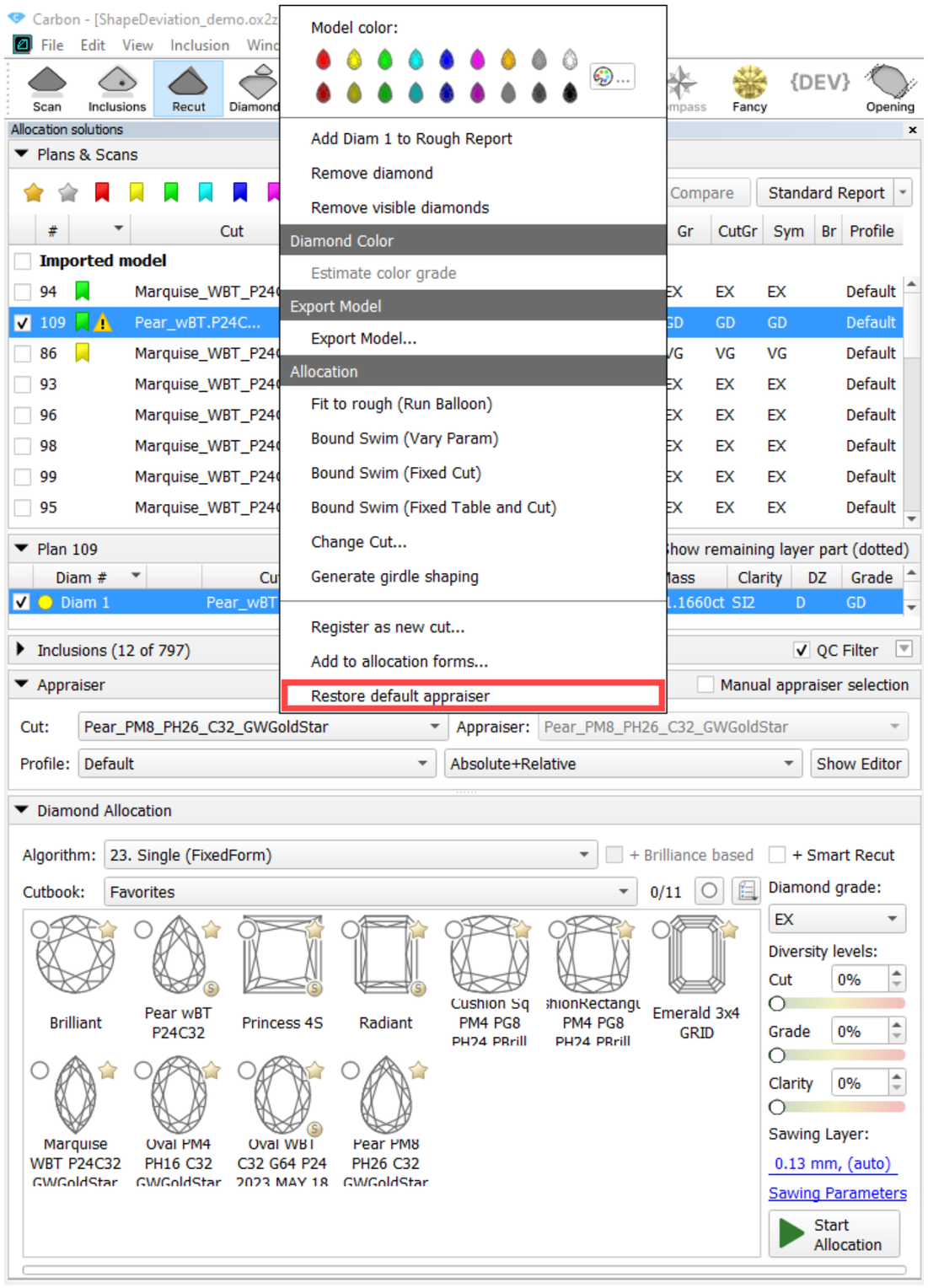
1. Select your solution.
2. Find the cut whose appraiser you want to use for viewing.
3. In the cut’s context menu, select the command “Link current Diamond to this appraiser.”



After that, fields related to the appraiser will show the linked appraiser's name, with a warning symbol next to the label. Reports will also be built using the linked appraiser.

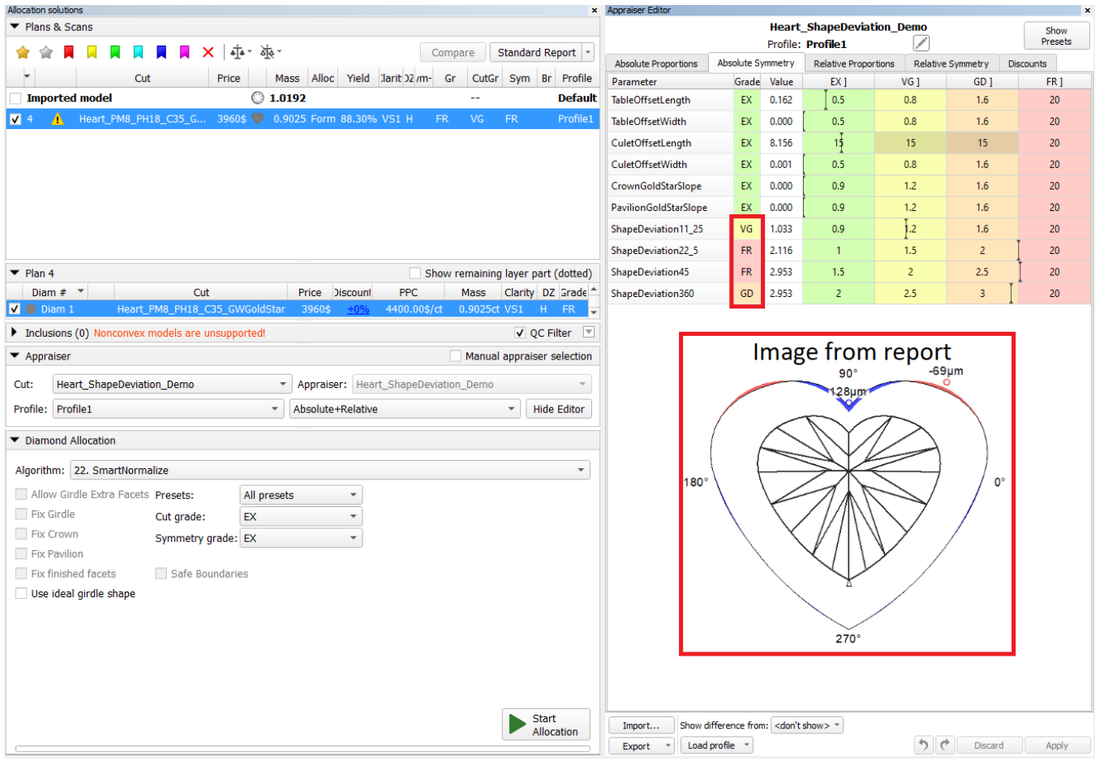


To go back to the default appraiser, use the command “Restore default appraiser” in the diamond’s context menu.

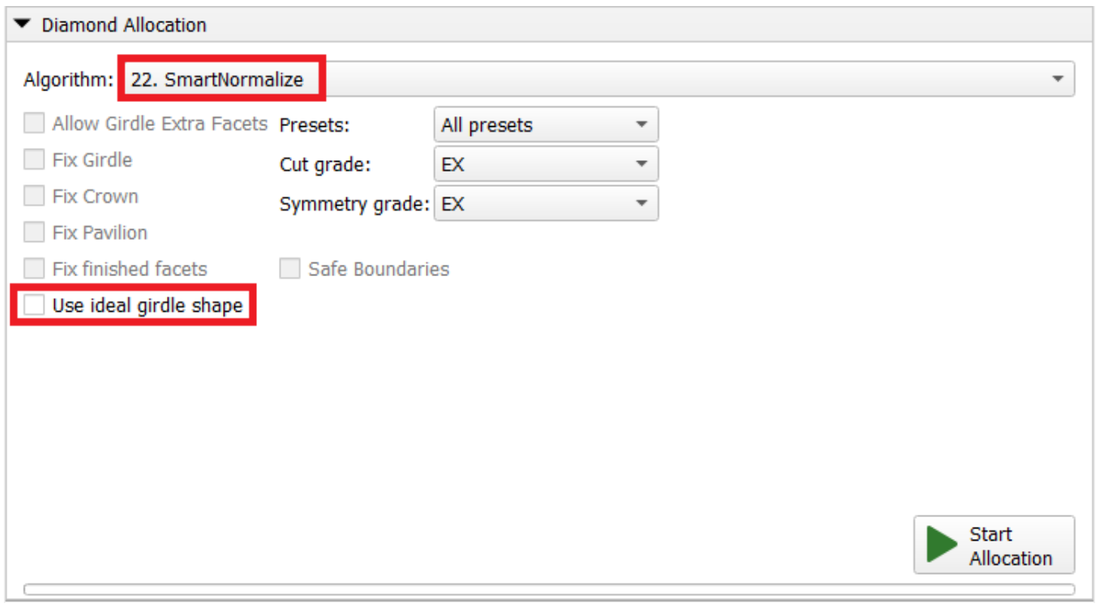


Option “Use ideal girdle shape” during SmartNormalize

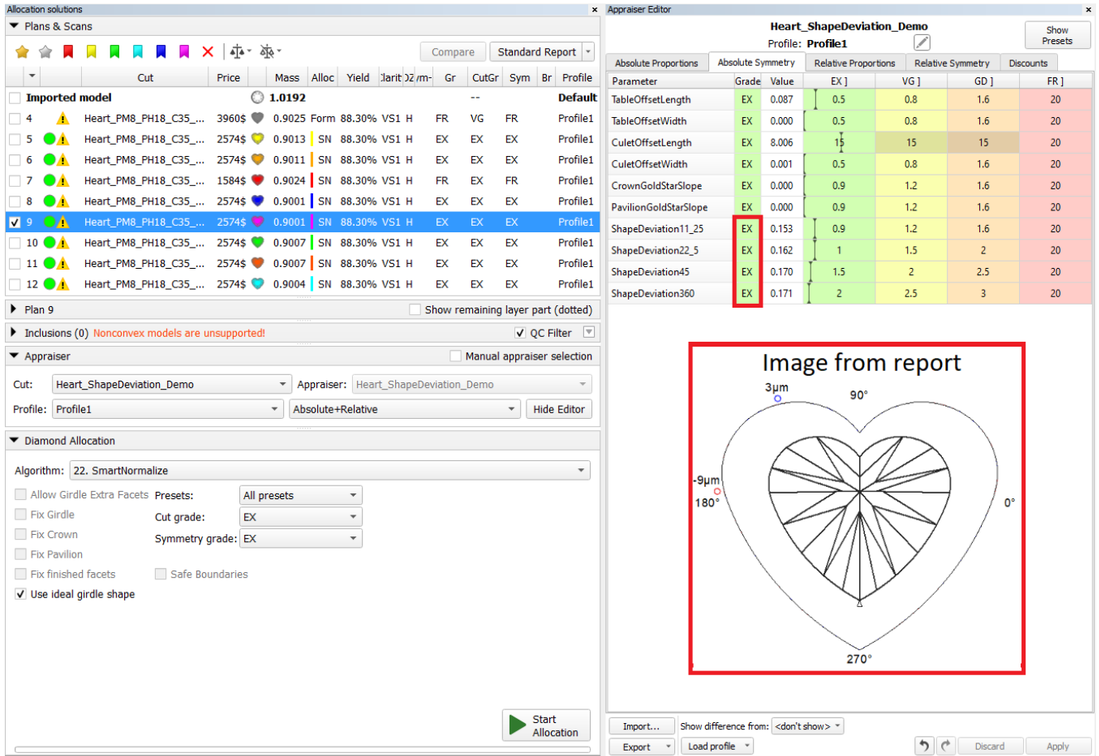
Suppose we have a solution that we want to use as allocation forms for the Heart_ShapeDeviation_Demo cut. We apply the command “Link current Diamond to this appraiser” to the solution. In the appraiser and report, we see poor Shape Deviation by appraiser Heart_ShapeDeviation_Demo.



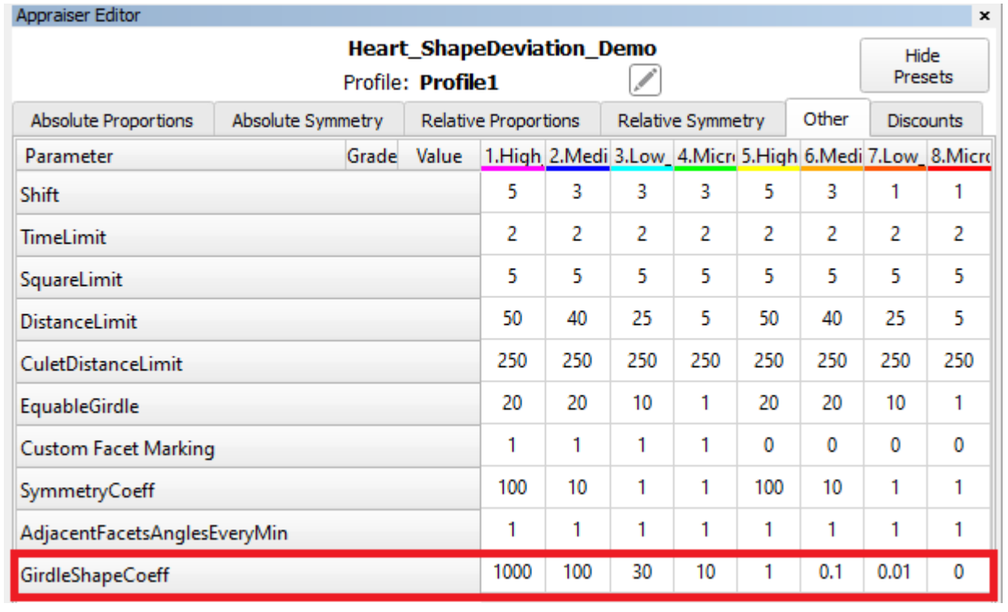
This means we need to run SmartNormalize with the “Use ideal girdle shape” option.



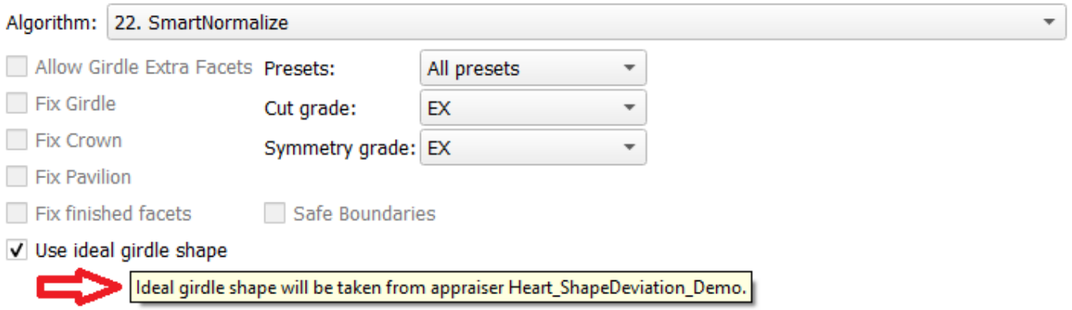
As a result, we get a range of solutions with Shape Deviation values from near zero up to the original value in one preset. The SmartNormalize results automatically use the same linked appraiser as the input solution, so you can evaluate the results with it.



The parameter controlling this range is GirdleShapeCoeff in the SmartNormalize presets.

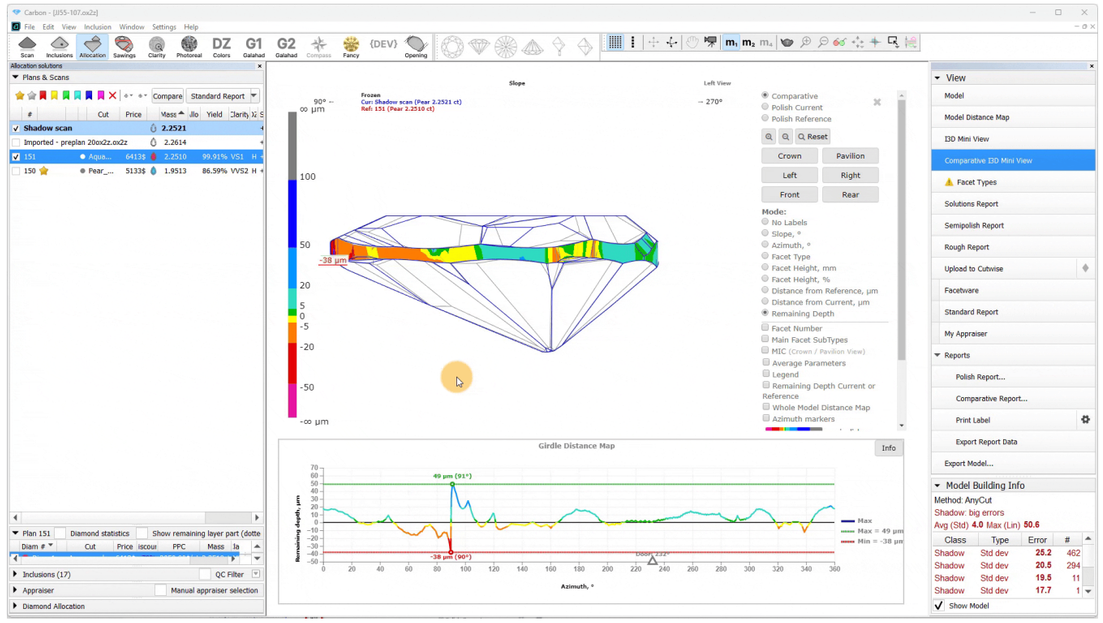


The tooltip for the “Use ideal girdle shape” checkbox provides helpful information to understand how it works.

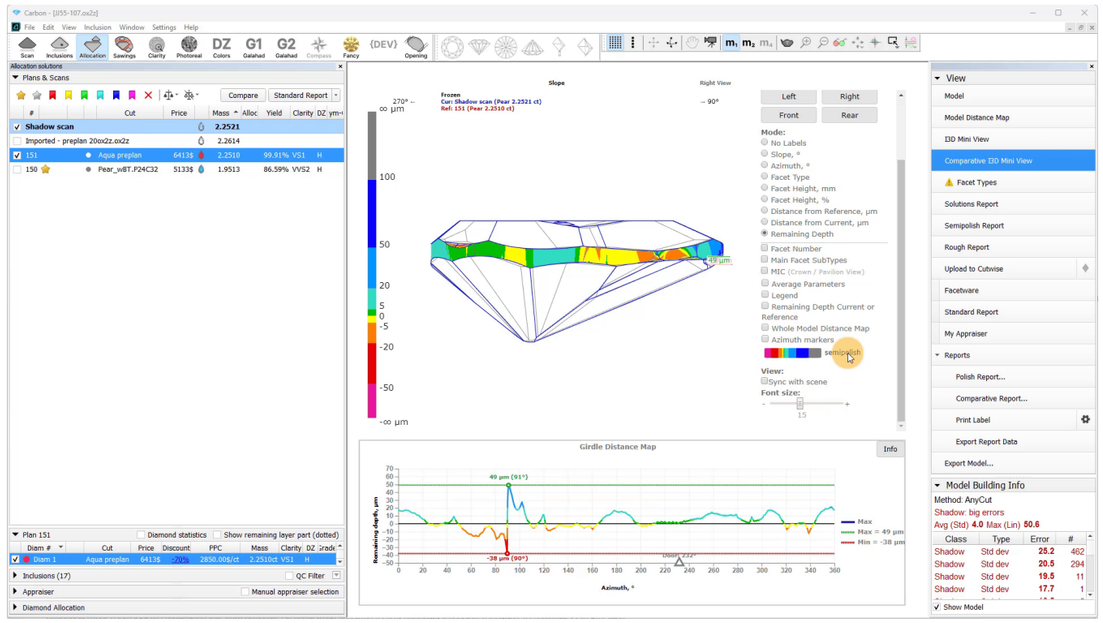


Remaining depth mode changes for Comparative I3D reports

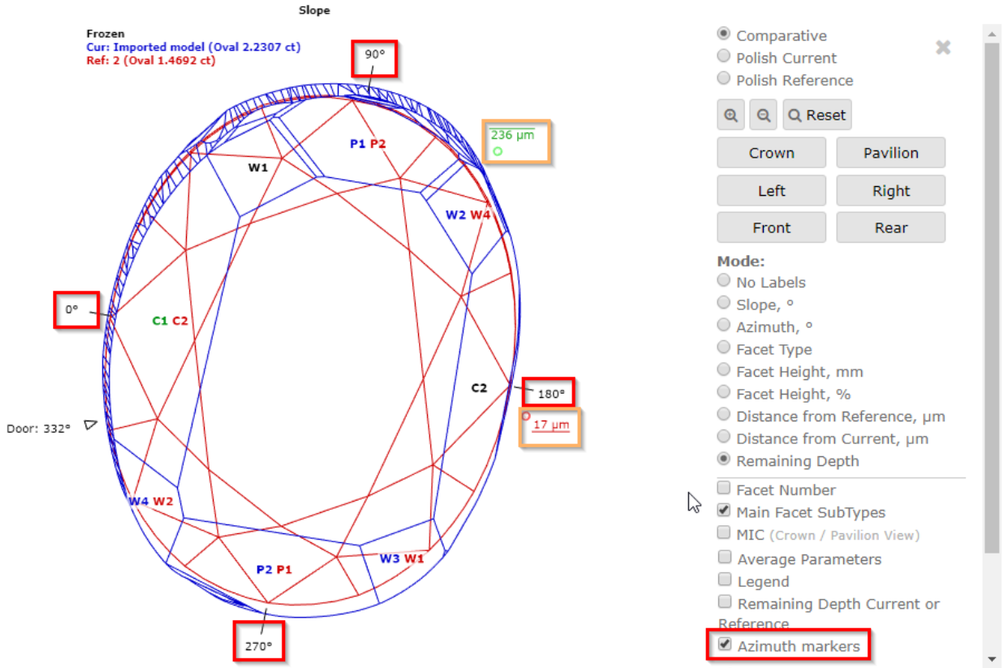
We've reintroduced **Remaining Depth** in a new and improved form - now it delivers faster performance and noticeably higher color accuracy.
Alongside the girdle comparison, you can now compare complete models for a more comprehensive analysis.
The **girdle distance graph** has also been enhanced with palette-based coloring, making it easier to visually link the graph to the model view.



Also you can now choose a color palette. Currently, there are two options available: **semipolish** and **rough**, each suited to different purposes, as their names suggest.
Semipolish is the original palette used in RD, while the **rough** palette is adapted from the Carbon Viewer.

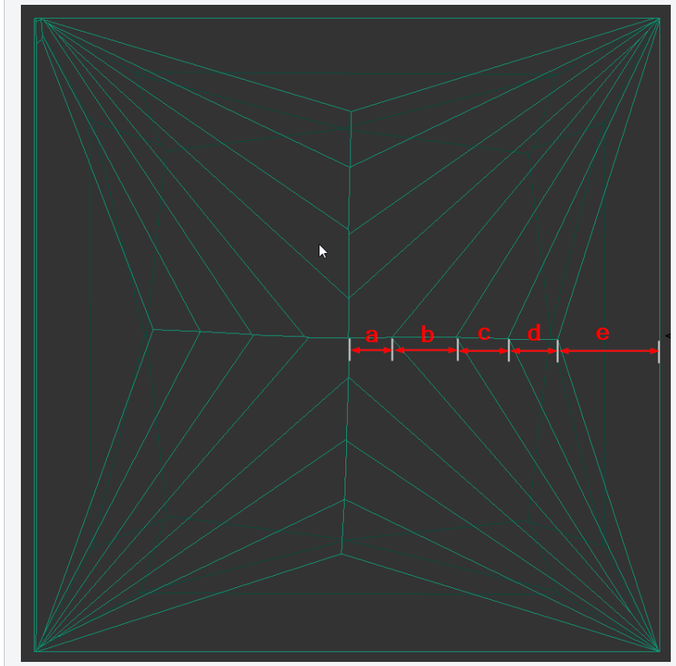


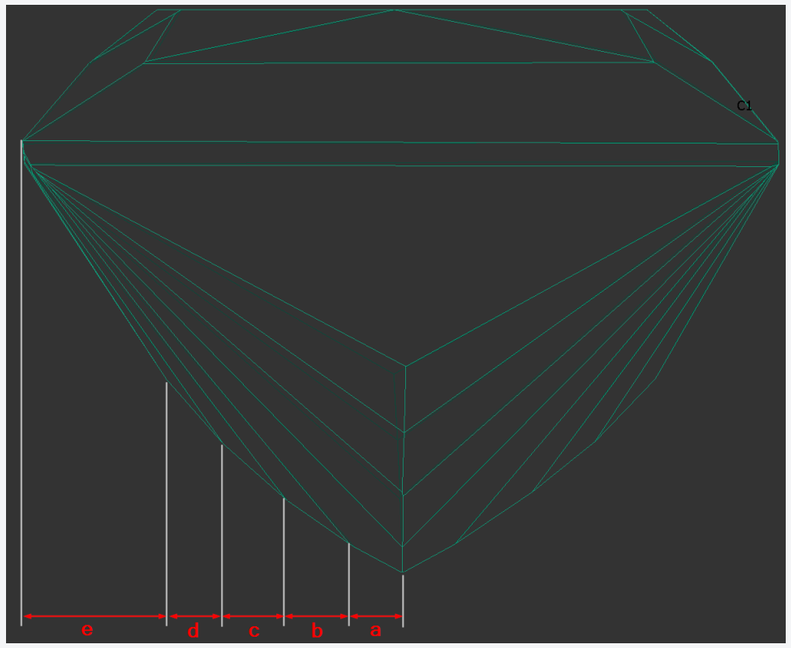
In I3D Comparative Remaining Depth mode, min/max indication added to the graph plot and 3D scene.
Azimuth markers were added to the 3D scene to make a more convenient navigation between the graph plot and the scene.



Facets Edge Width for Princess cut

The parameters are calculated in mm and %. If Princess Cut has RT <= 1.05, then the parameters in % are calculated in relation to the width, and if more than 1.05, then the parameters in relation to the length are also added. The distances are calculated in projection on the plane of the table.





The bookmarks follow.
"a":
"PAV_MAIN_FACET_EDGE_WIDTH_MM",
"PAV_MAIN_FACET_EDGE_WIDTH_PC",
"PAV_MAIN_FACET_EDGE_LENGTH_MM",
"PAV_MAIN_FACET_EDGE_LENGTH_PC",

"d", "c", "b" (numbering i comes from the girdle - that's how it was decided to number the chevrons):
"CHEVRONi_EDGE_WIDTH_MM",
"CHEVRONi_EDGE_WIDTH_PC",
"CHEVRONi_EDGE_LENGTH_MM",
"CHEVRONi_EDGE_LENGTH_PC",

"e":
"PAV1_MAIN_FACET_EDGE_WIDTH_MM",
"PAV1_MAIN_FACET_EDGE_WIDTH_PC",
"PAV1_MAIN_FACET_EDGE_LENGTH_MM",
"PAV1_MAIN_FACET_EDGE_LENGTH_PC",

Heart Groove measurements

We added the following dimensions (in mm and as a percentage with respect to width).

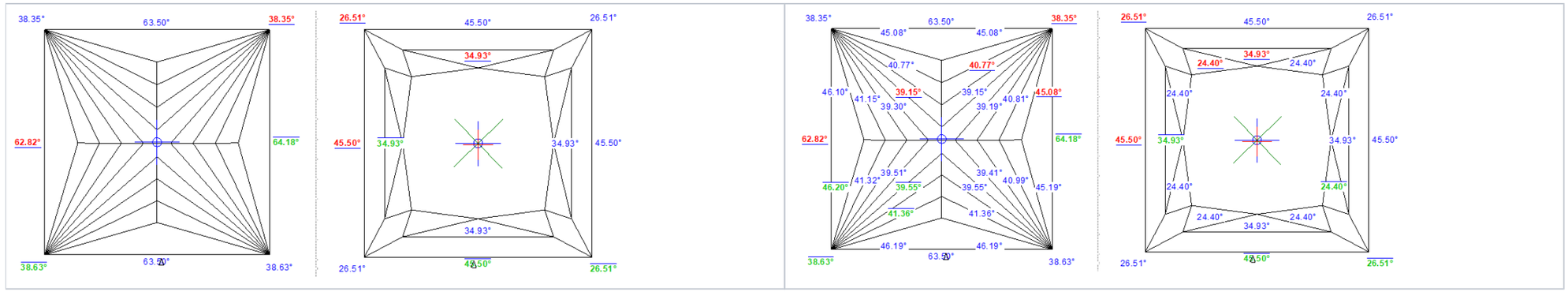
See new bookmarks:

1. Dimension “A” - "HEART_GROOVE_WIDTH_MM", "HEART_GROOVE_WIDTH_PC"
2. Dimension “B” - "HEART_GROOVE_DEPTH_CRN_MM", "HEART_GROOVE_DEPTH_CRN_PC"
   blocked URL
3. Dimension “C” - "HEART_GROOVE_DEPTH_PAV_MM", "HEART_GROOVE_DEPTH_PAV_PC"
   blocked URL
4. Dimension “D” - "HEART_GROOVE_HEIGHT_MM", "HEART_GROOVE_HEIGHT_PAV_PC"
   blocked URL

Princess reports - improved pictures

Information about chevrons and star facets has been added to the pictures:

Before	Now



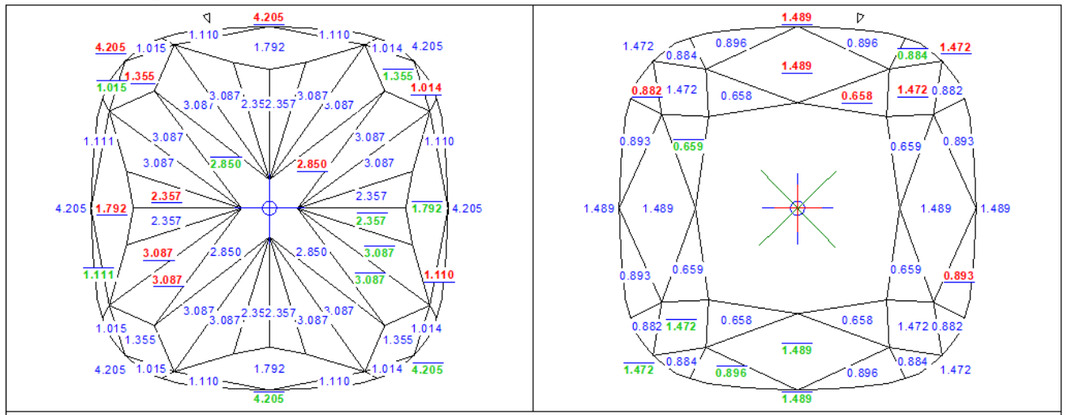
The new images and bookmarks are available for custom reports

The new images containing Crown and Pavilion Height, along with Facets Height Data, are available under bookmarks "PAVILION_HEIGHT_PC_REPORT", "PAVILION_HEIGHT_MM_REPORT", "CROWN_HEIGHT_PC_REPORT", and "CROWN_HEIGHT_MM_REPORT".

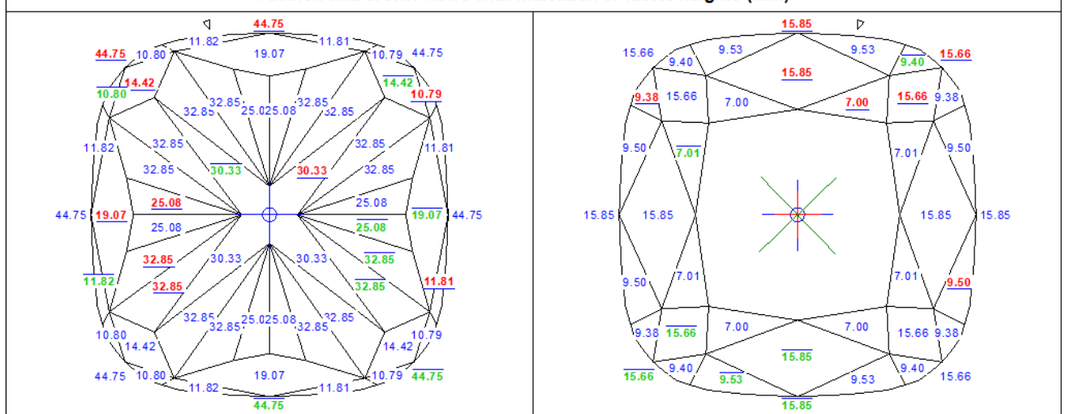
The new images can be found in following reports:

- FULL_REPORT_FOR_CUSHION.RTF
- FULL_REPORT_FOR_SQUARE_CUSHION.RTF

Facets heights

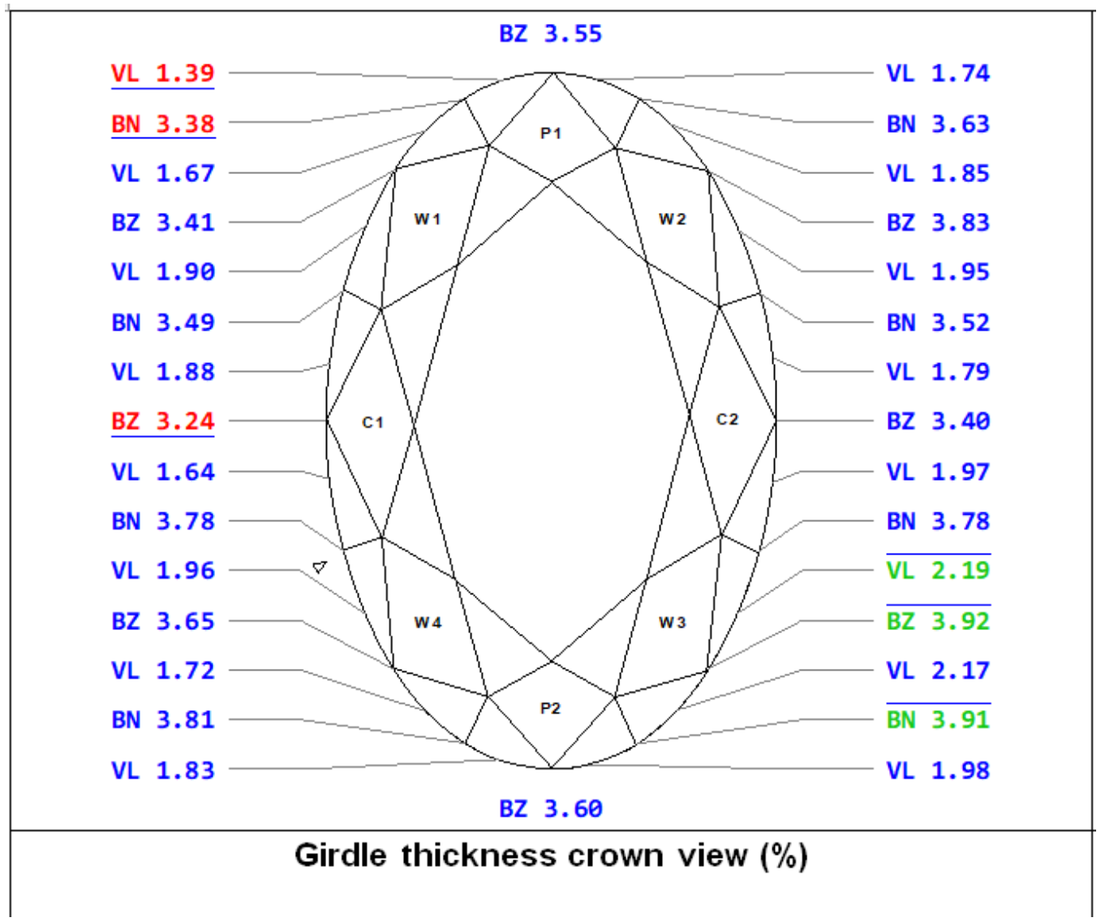


Pavilion and crown views with indication of facets heights (mm)



Pavilion and crown views with indication of facets heights (%)

The new Girdle Height image with Valley was added to FULL_REPORT_FOR_BRILLIANT.RTF and FULL_REPORT_FOR_ROUNDED_FANCIES.RTF and available under the bookmark "GIRDLE_THICKNESS_PC_CRN_VIEW_COLUMN."



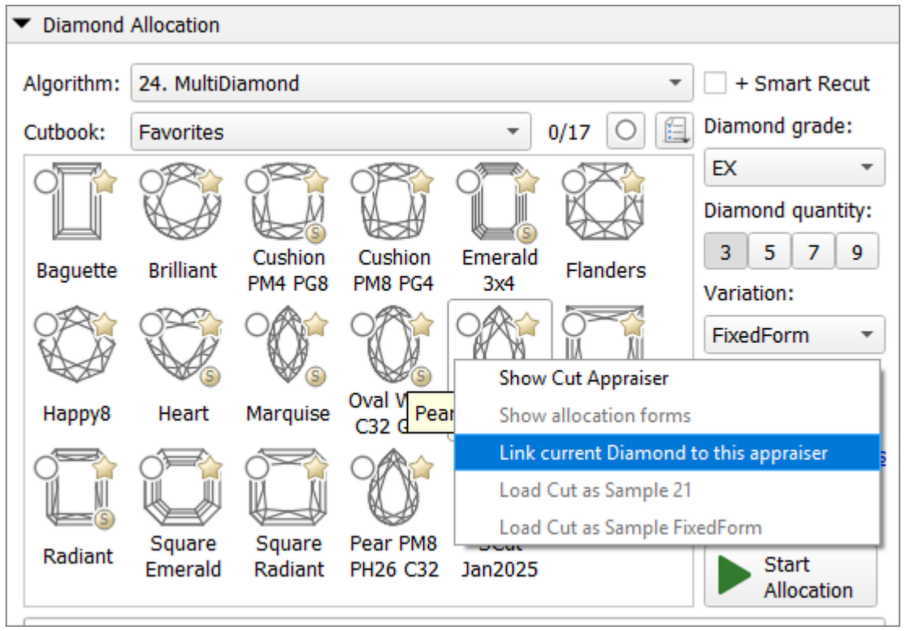
The new bookmarks for Square StepCut and Square Radiant have been added to the RTF report:

- CORNER_ANGLE_SQUARE_MM_...
- CORNER_ANGLE_SQUARE_PC_...
- PAV_CORNER_ANGLE_SQUARE_MM_...
- PAV_CORNER_ANGLE_SQUARE_PC_...
- CRN_CORNER_ANGLE_SQUARE_MM_...
- CRN_CORNER_ANGLE_SQUARE_PC_...
- PAV_GIRDLE_SIDE_SQUARE_MM_...
- PAV_GIRDLE_SIDE_SQUARE_PC_...
- CRN_GIRDLE_SIDE_SQUARE_MM_...
- CRN_GIRDLE_SIDE_SQUARE_PC_...

Appraisers & Pricelists

Link current Scan to this appraiser

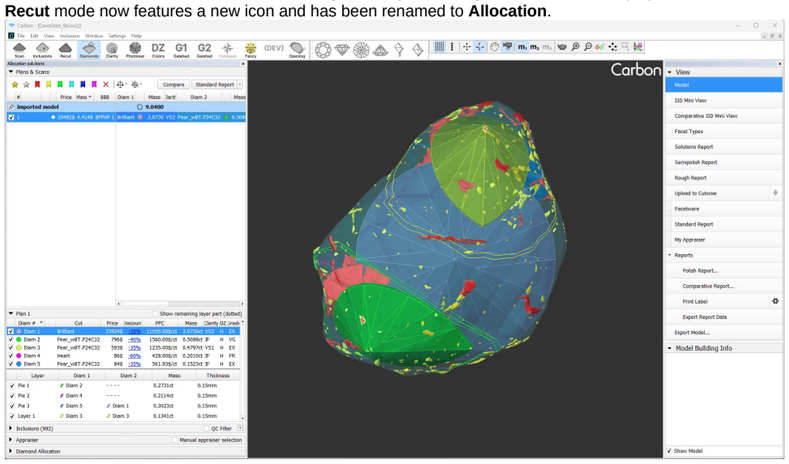
The cut name set using "Link current Scan to this appraiser" was overwritten by the automatically defined name after changing the Facet Types.



User interface updates

Modes renaming and relocation

- **Diamonds** mode has been relocated to the right-hand panel alongside other scene display modes and renamed to **Model Distance Map**.
- **Recut** mode now features a new icon and has been renamed to **Allocation**.



Batch Operations Panel for Inclusions

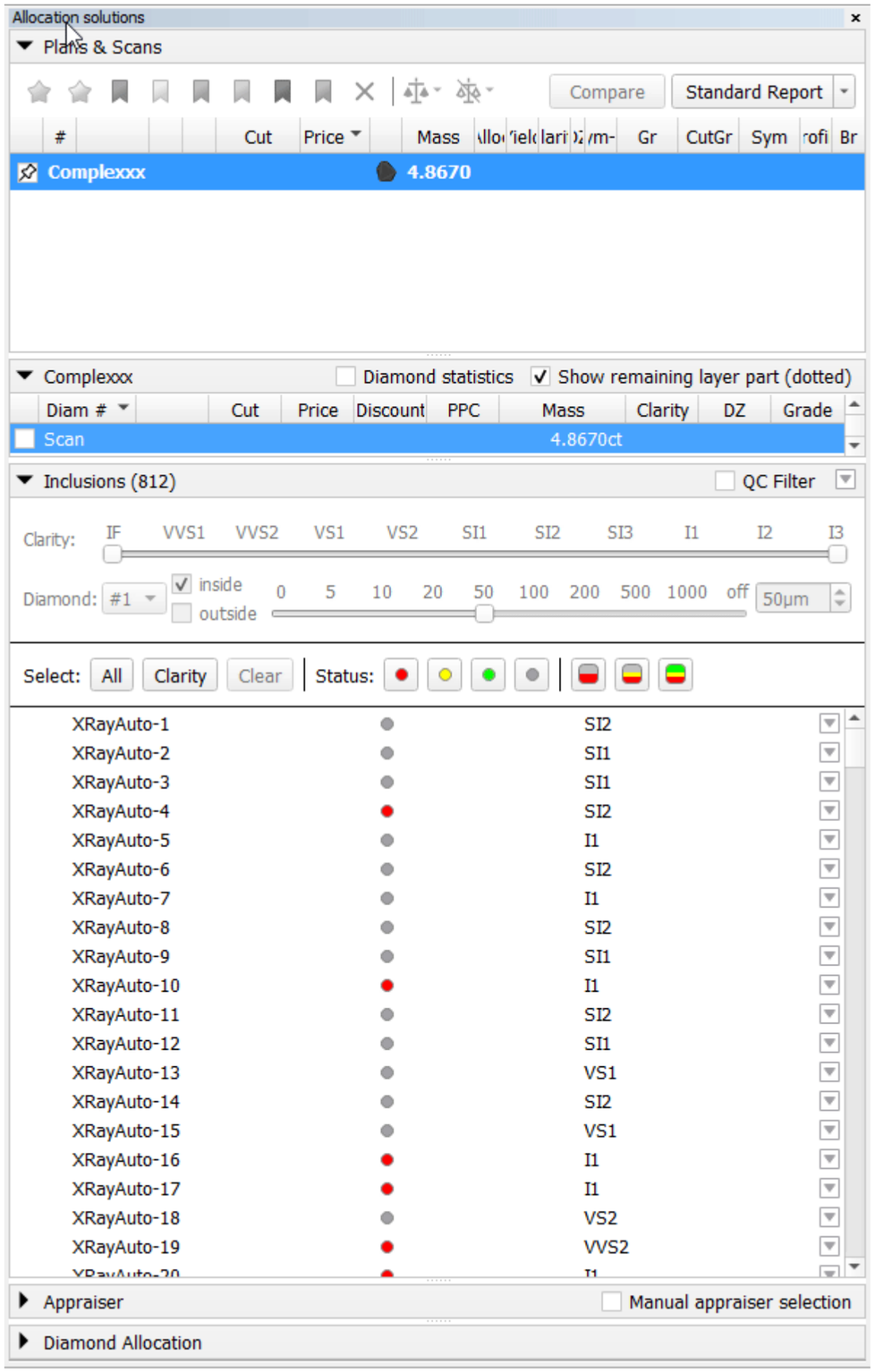
The Batch Operations panel provides tools for performing actions on multiple inclusions simultaneously, significantly streamlining the inclusion management workflow.

The panel is divided into two main operation groups: **Select** and **Status**.

1. Select Operations

This group contains functions for managing the selection of items in the inclusions list.

- All Button: Selects all items currently visible in the list.
- Clarity Button: Opens the window to select inclusions based on a specific Clarity value. These inclusions will be added to those already selected.
- Clear Button: Deselects all items in the list.

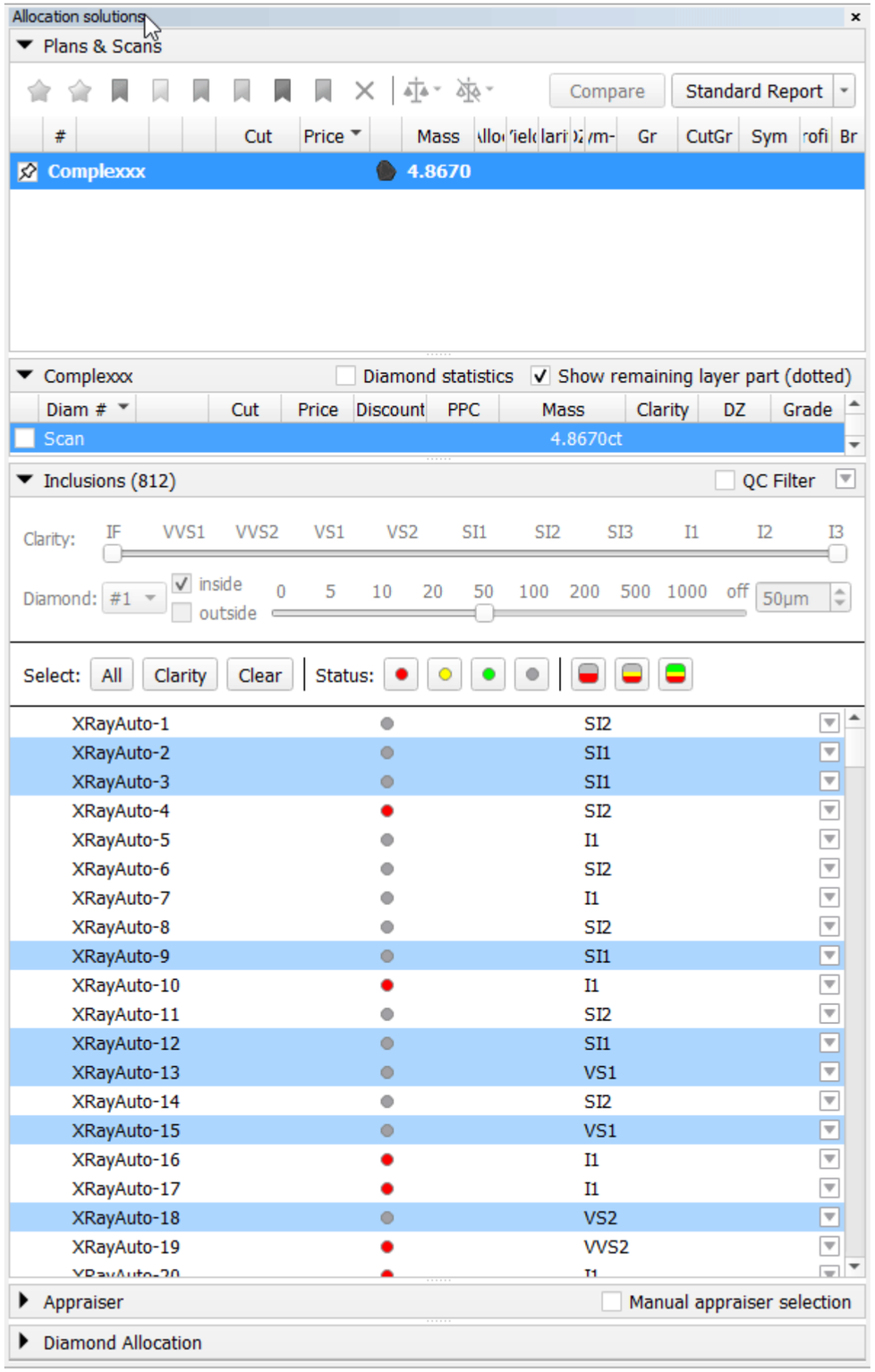


2. Status Operations

This group contains functions for setting the allocation status.

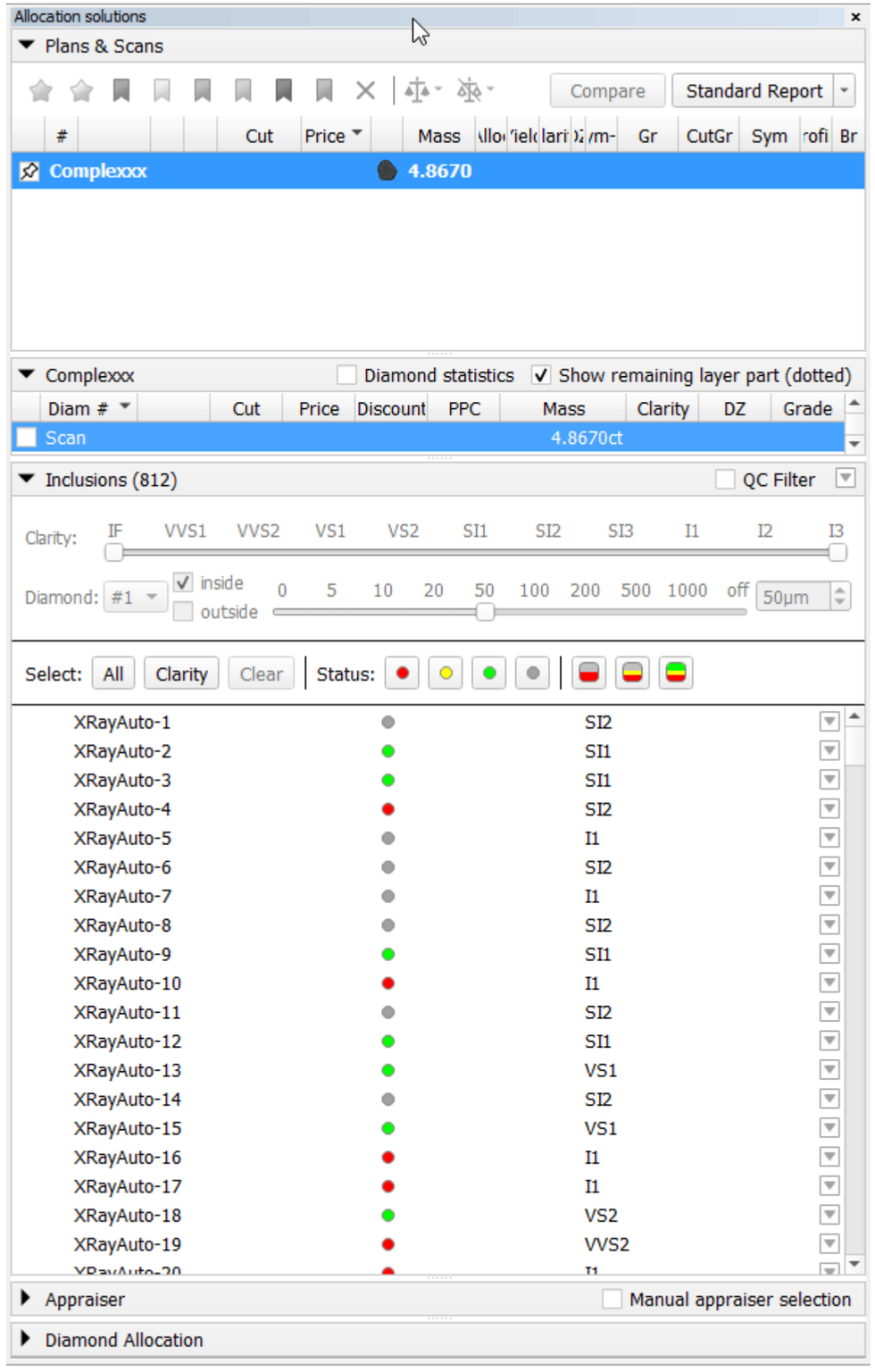
2.1. Single-Status Buttons

Buttons: Red, Yellow, Green, Gray. These buttons immediately set the corresponding status for **currently selected** inclusions.

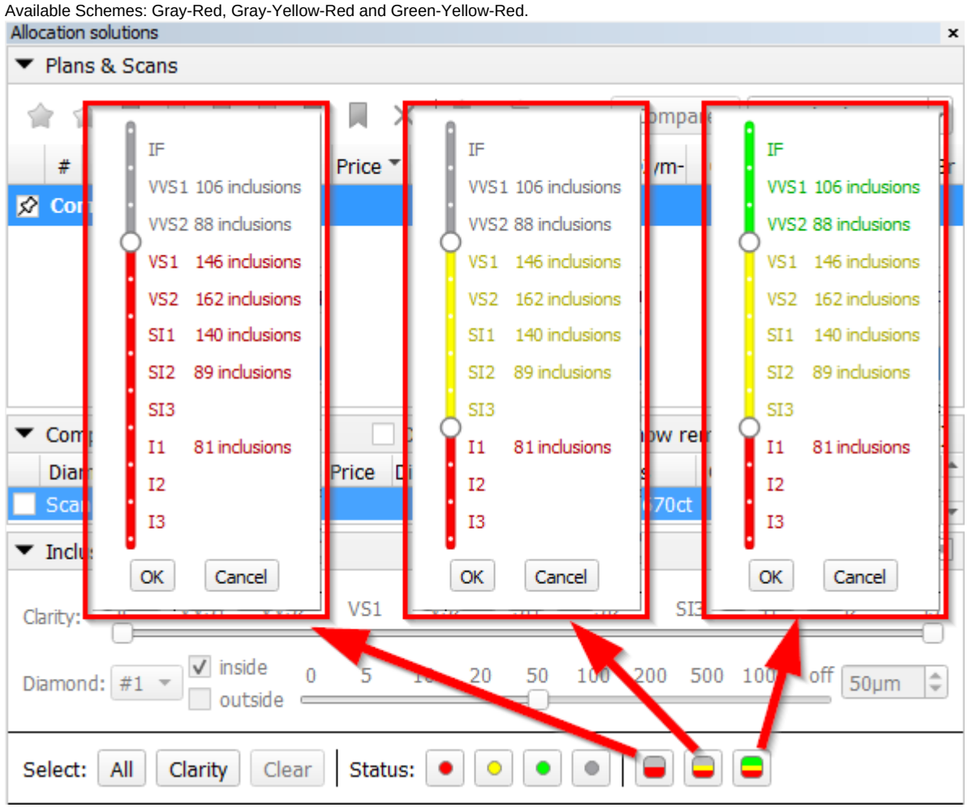


2.2. Clarity-Based Status Assignment

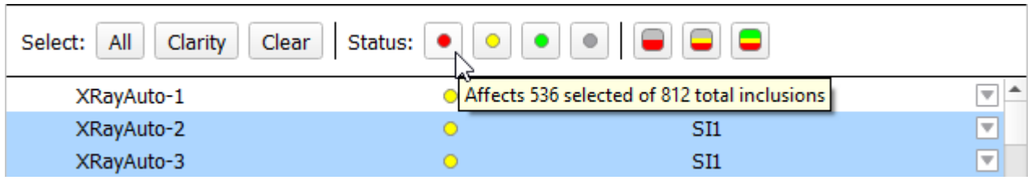
These operations assign statuses to inclusions based on their Clarity value. The status is applied to **all inclusions currently in the list** (i.e., those passing filter above).
Clicking one of these buttons opens a configuration pop-up. Within the pop-up, sliders are used to define threshold values for the Clarity attribute. A pre-defined status scheme is applied based on these thresholds, assigning a status to each inclusion according to its Clarity value.



Available Schemes: Gray-Red, Gray-Yellow-Red and Green-Yellow-Red.



All buttons in the **Status** group have descriptive tooltips. Hovering over a button provides a clear explanation of which inclusions will be affected by the operation.



Scene rotation tool (Ox/Oy/Oz)

You can navigate the scene using your mouse. However, for more precise adjustments, you'll need to use the movement panel, which can sometimes be inconvenient.

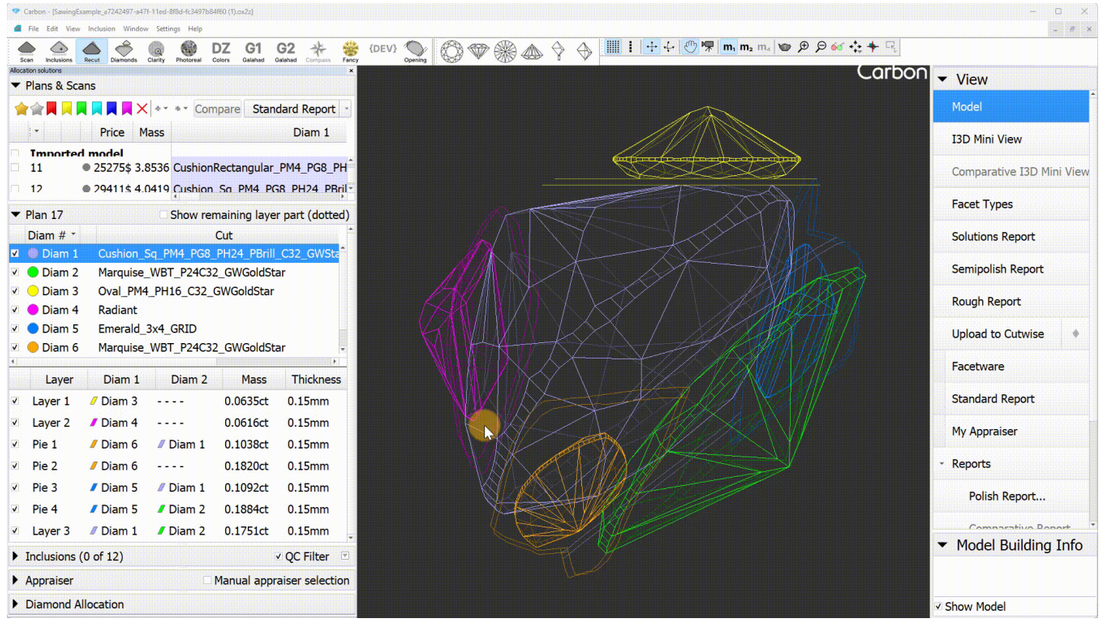
We'd like to introduce Ox/Oy/Oz rotation modificators.

Video | Axes rotation modificator - rotation along Ox/Oy/Oz axes				
Published:	2024, December 13	**Last Updated:**	2025, September 03	**v.1.3**
Your browser does not support the HTML5 video element				

Video summary: To rotate along those axes, simply press the H (Horizontal), V (Vertical) or (Center) keyboard button respectively and rotate the scene This tool is particularly useful in several situations, such as: • Working alongside orientation buttons • Integrating with context menu orientation options • Facilitating object rotation.	
Video keywords: rotation, scene, axes	
Data	Sawing_test_oxy.ox2z

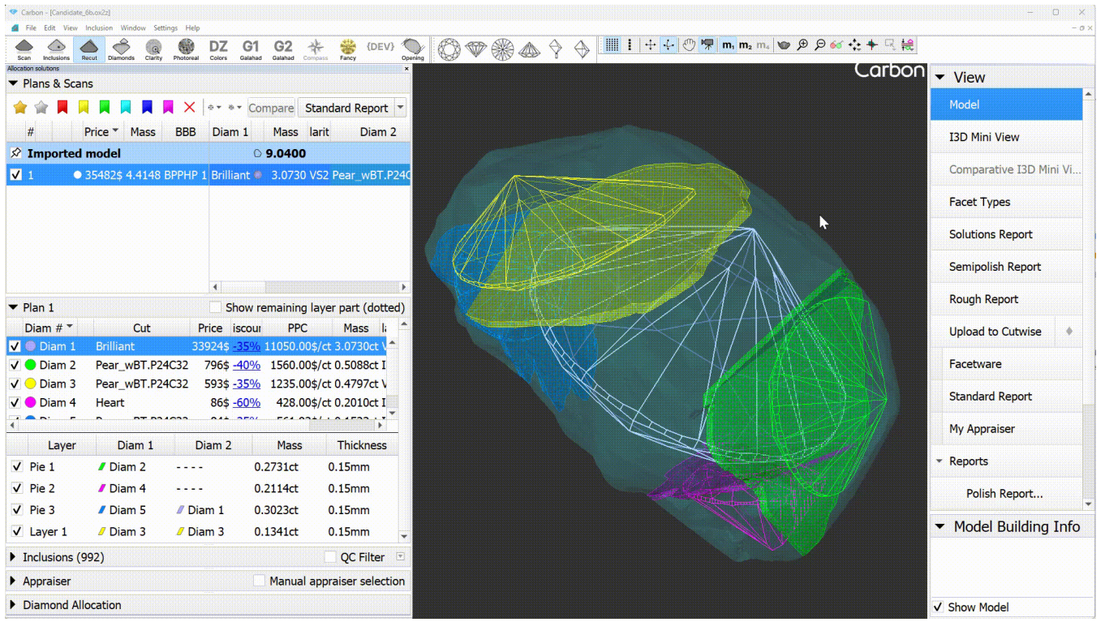
Layer selectable from the panel

Layers are now selectable like diamonds, enabling the use of object movement tools on the selected layer.



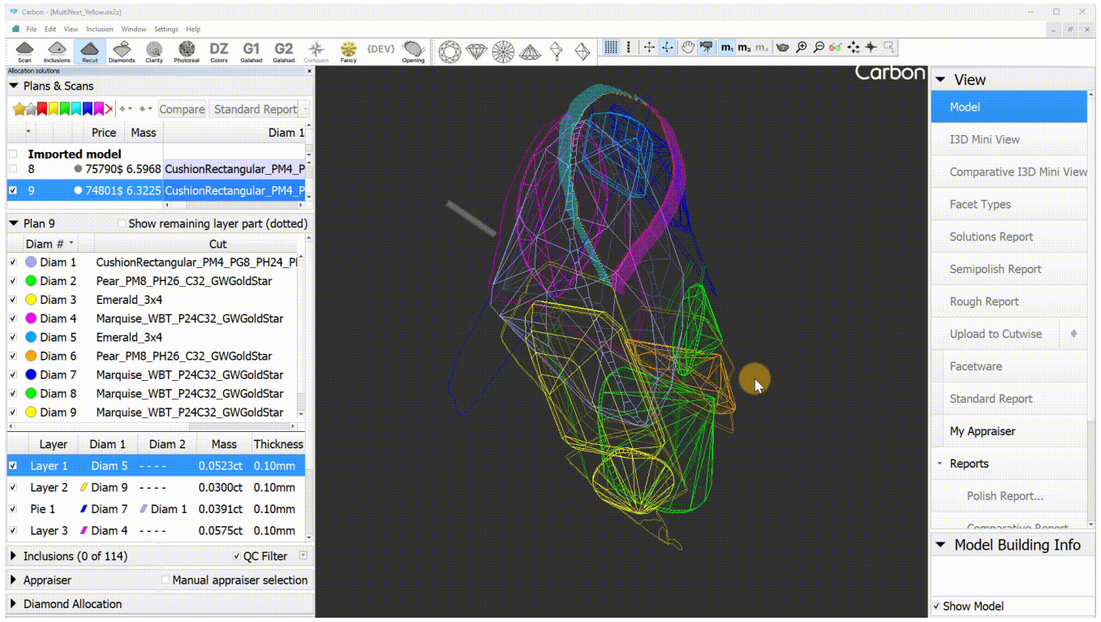
Objects selection tool

You can now select sawings directly on the scene with a simple click, just like diamonds. This is also useful for opening the context menu, which appears for the active diamond. In Lines mode, the active diamond is now visually distinguished on the scene with thicker lines.



Operation "View along sawing direction"

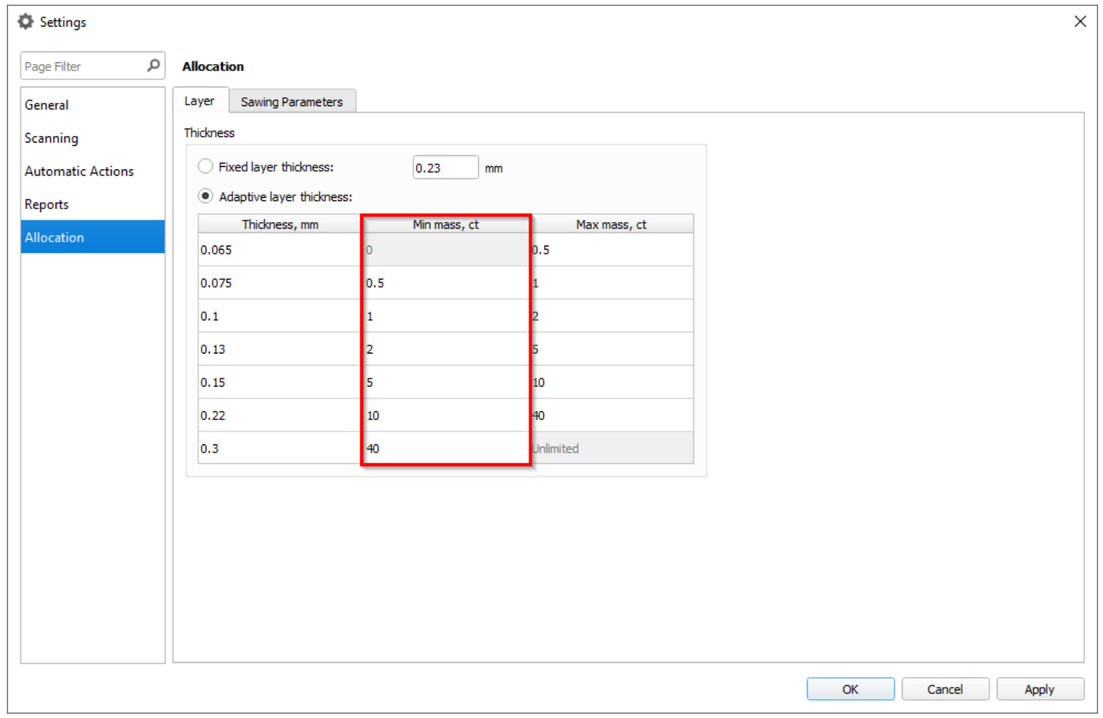
A new context menu item, "View along sawing direction," has been introduced for layers. This command arranges the scene so that the layer becomes horizontal.



Scene objects - layers

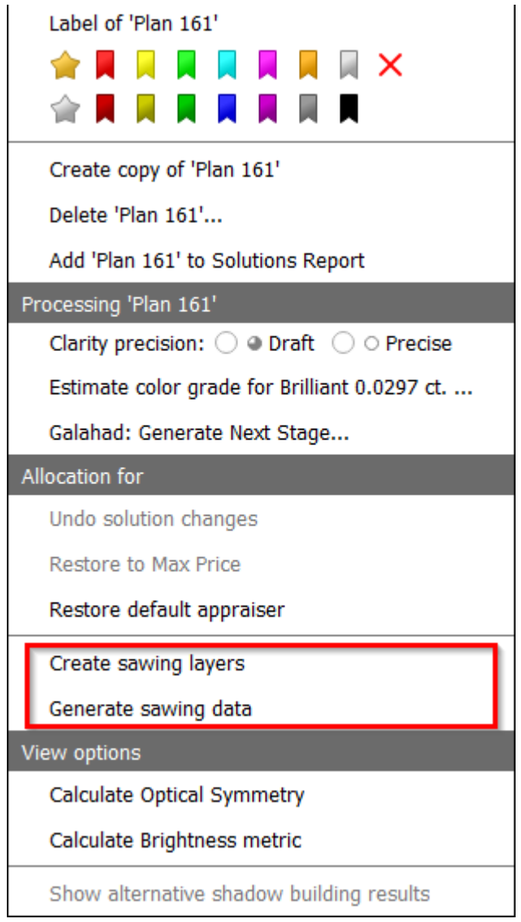
Sawing layers thickness settings

An additional column has been added to the sawing thickness table to display the minimum mass value, indicating the interval for the corresponding thickness value.

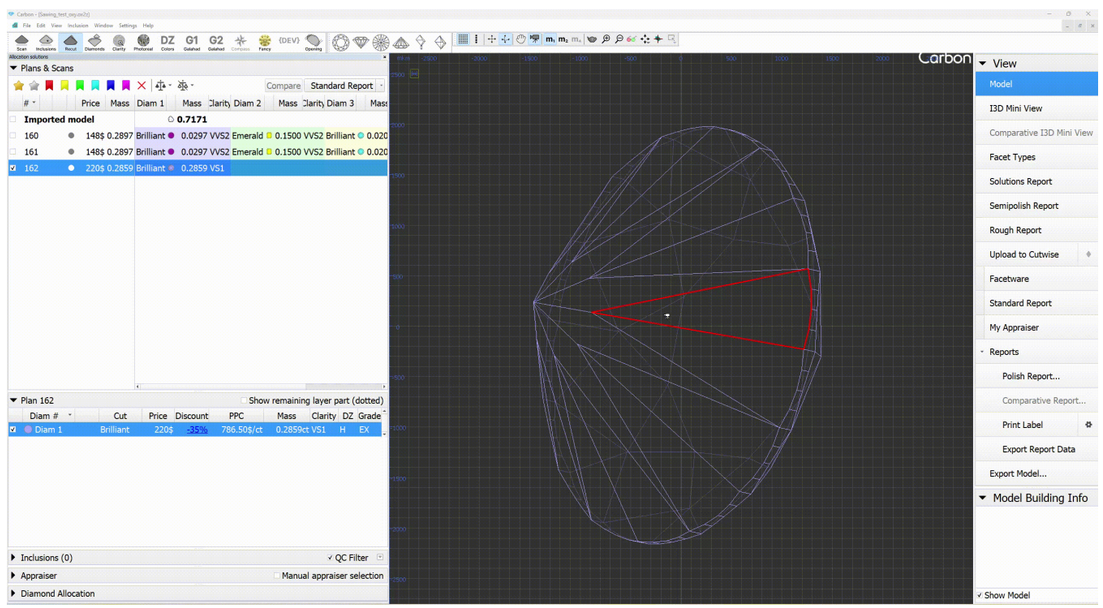


Sawing parameters

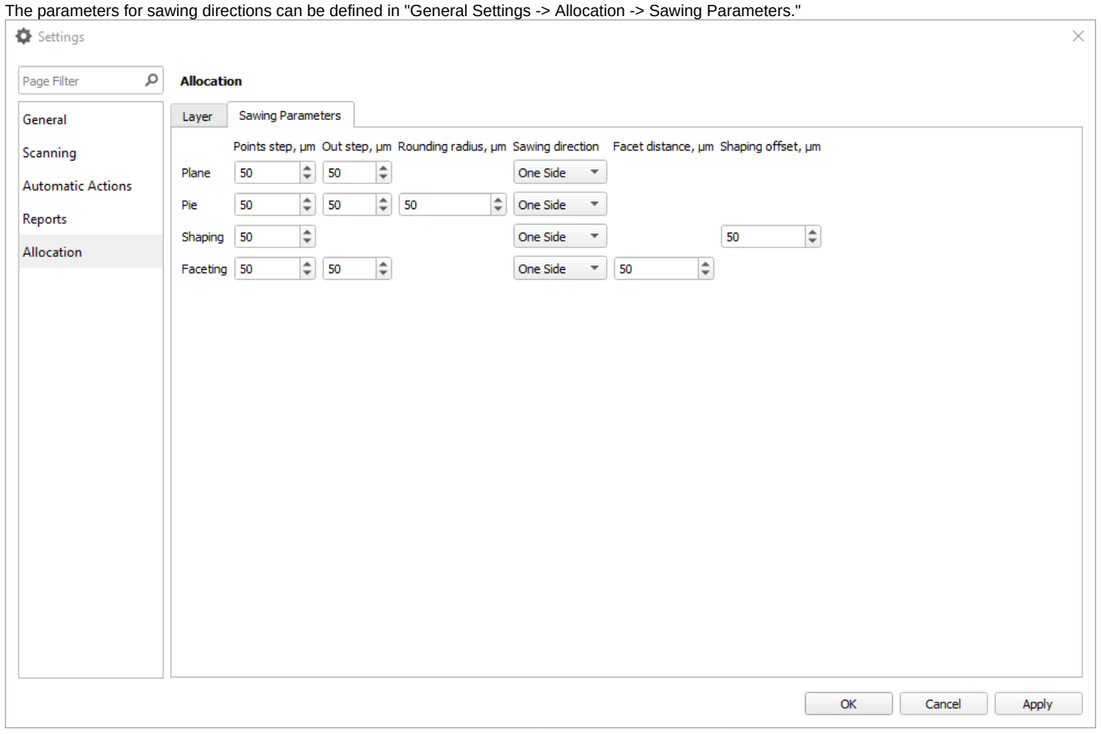
The sawing layers have been upgraded with new data and an improved interface. The "Create sawing data" command in the solutions context menu has been replaced by two distinct commands: "Create sawing layers" and "Generate sawing data."



Here's the key difference: "Create sawing layers" removes all existing layers and populates the solution with appropriate new layers (similar to the previous "Create sawing data" command). In contrast, "Generate sawing data" simply adds additional data to the already existing layers. This additional data includes the following: generating half-planes where necessary, creating a glue point, establishing sawing directions for each layer, and developing a rough projection contour (blue line).



The parameters for sawing directions can be defined in "General Settings -> Allocation -> Sawing Parameters."



You can also set parameters for each layer individually by clicking on the "Sawing parameters panel" in the layer context menu.
The available parameters are:
For Plane:

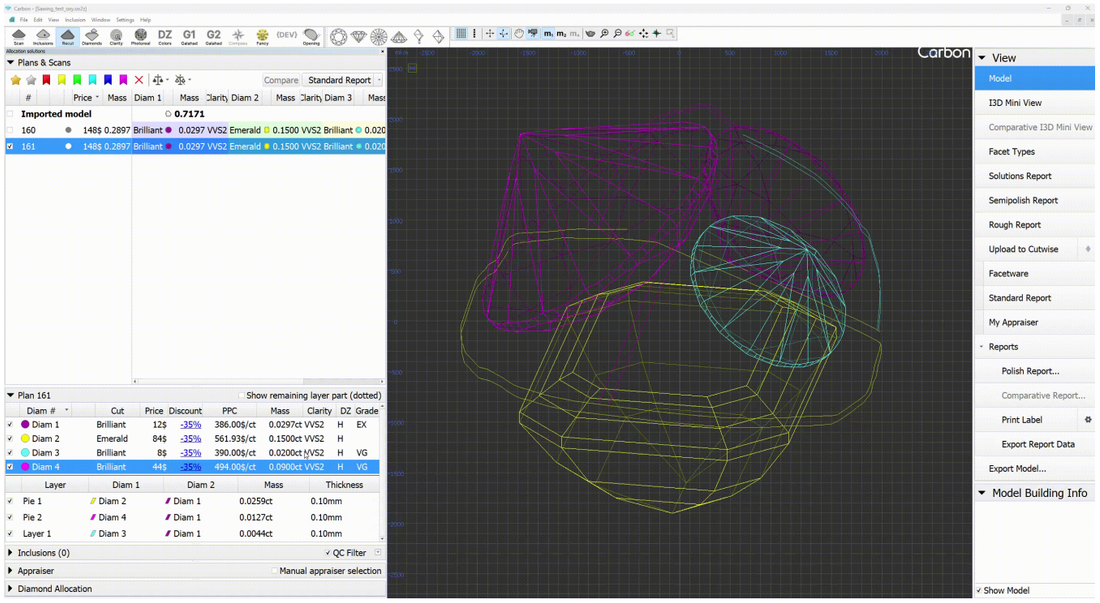
- Points step
- Out step
- Sawing angle
- Sawing direction

For Pie:

- Points step
- Out step
- Sawing direction

For Shaping:

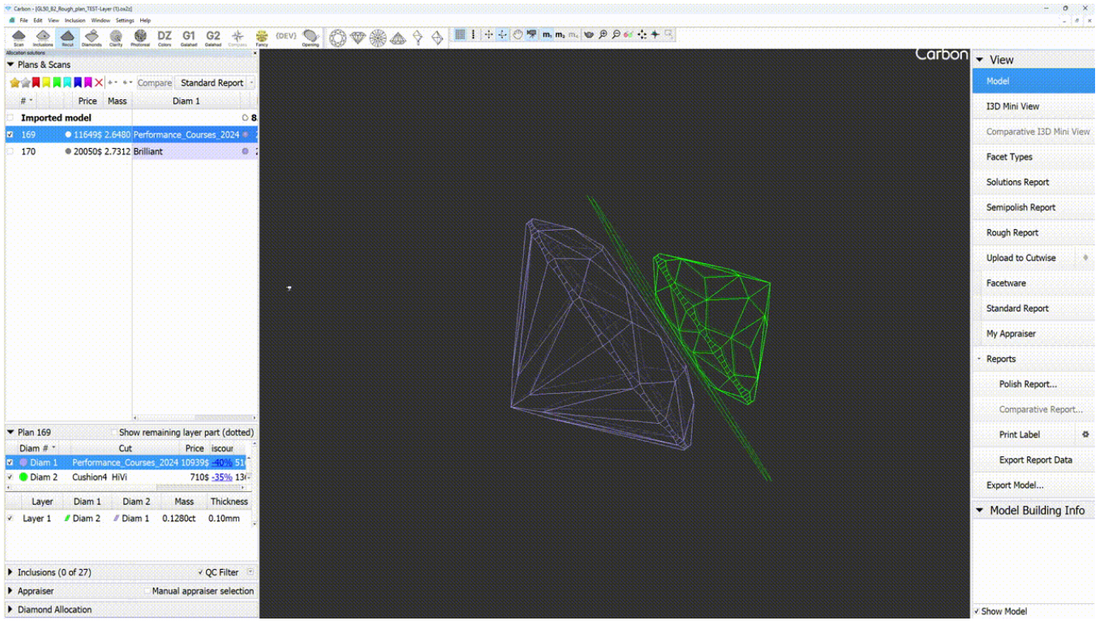
- Shaping offset
- Sawing direction



Here is a brief description of each parameter:

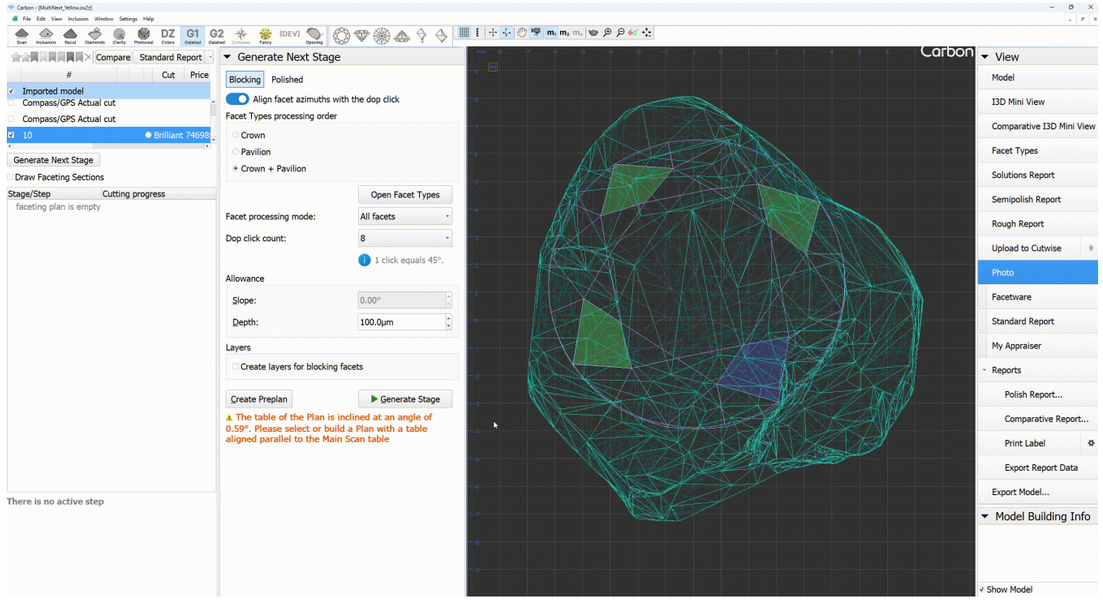
- Points step: The distance between key points along the rough diamond for laser sawing.
- Out step: An additional key point located outside the rough diamond for laser sawing.
- Sawing angle: Controls the sawing direction vector for individual layers.
- Sawing direction: Determines whether the sawing is done on one side or both sides.
- Shaping offset: The distance to the girdle for laser sawing.

To create a shaping, you can use the "Generate girdle shaping" command from the diamond context menu. For shaping sawings, there is additional data provided: a shaping contour around the girdle (yellow line).



Blocking layers

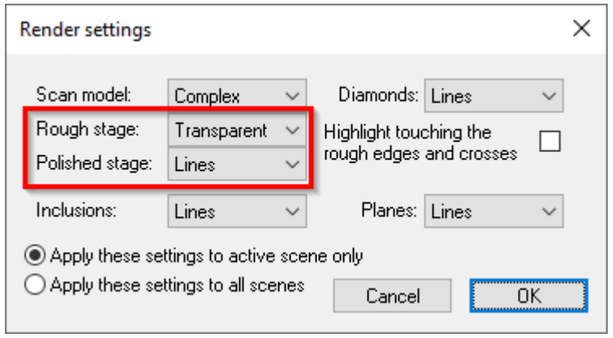
You now have the option to create blocking layers when generating a preplan. To do this, simply check the "Create layers for blocking facets" checkbox and click the "Create preplan" button.
The sawings will be positioned with an offset from the facets. You can modify the offset value in "General Settings -> Allocation -> Sawing Parameters -> Facet Distance".



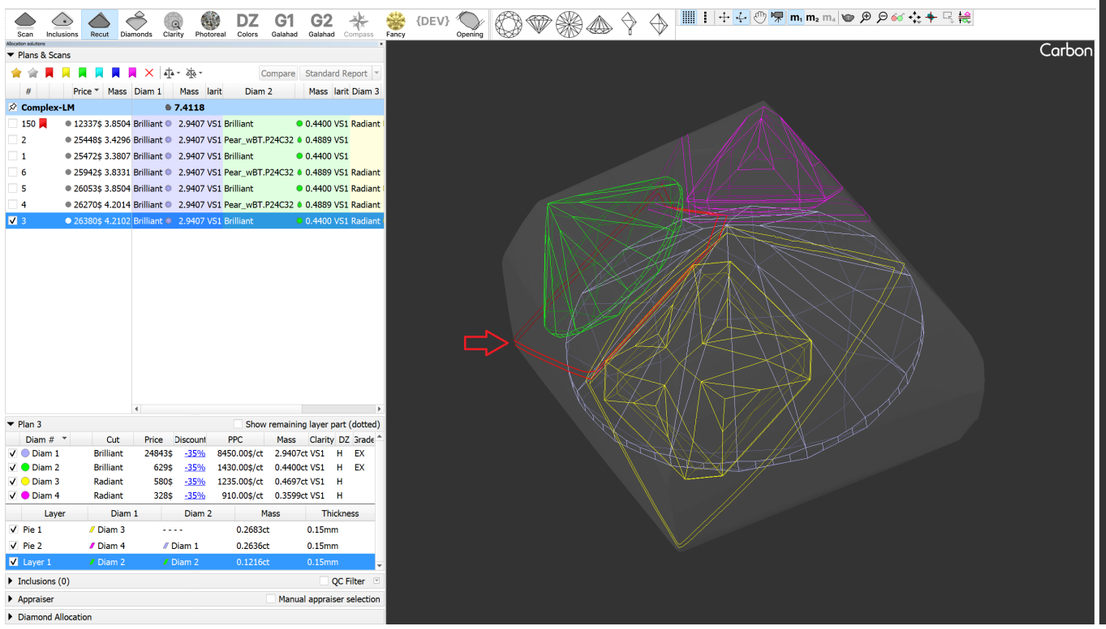
Pinning Solutions in the Solution List. Rendering upgrades.

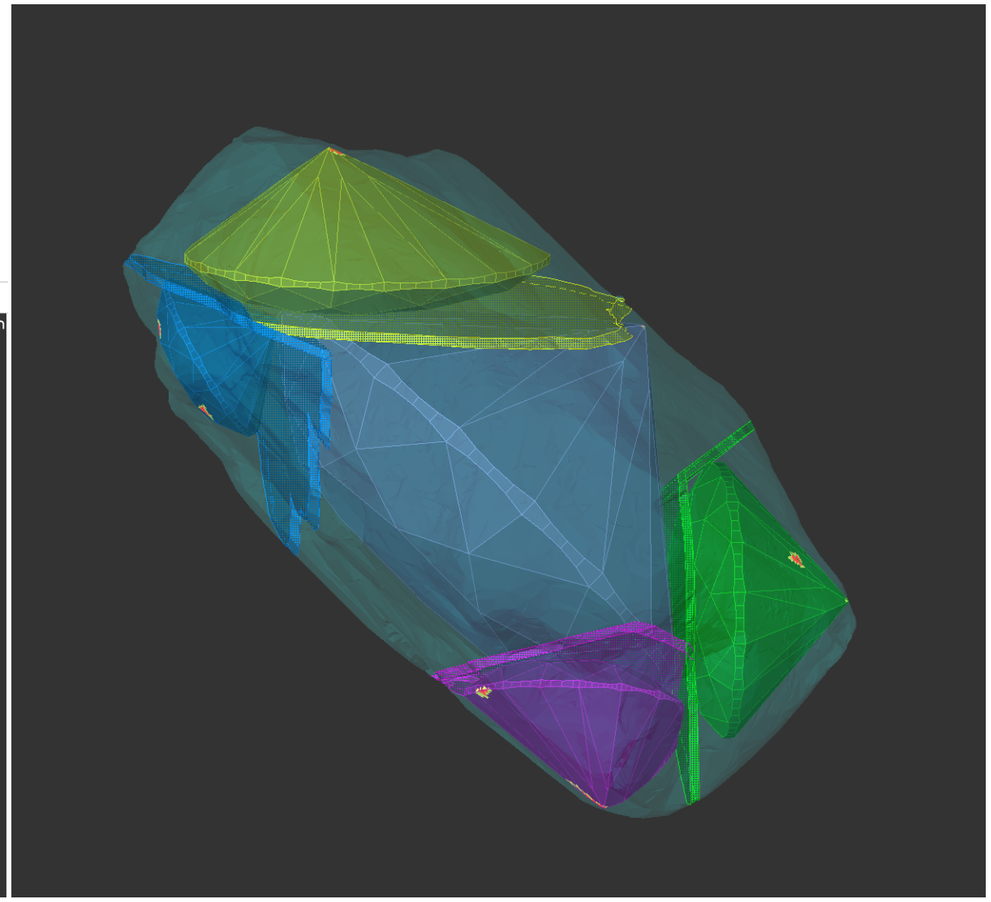
We have added the ability to pin solutions in the solution list. To pin a solution, right-click its checkbox; click the same area again to unpin it. The pinned solution remains visible on the scene at all times, regardless of your selection from the list. This is particularly useful for keeping scans (like the main scan) permanently displayed.

When loading a project, the **Main Scan** is automatically pinned if its processing stage is **Rough**, **Saw**, or **Bruted**. In **Recut mode**, scans with these stages appear transparently instead of in lines mode—this can be adjusted in the rendering settings, where separate display modes for **Rough** and **Polished** scans are now available.



Saw rendering has been improved: non-visible parts are now shaded, and the **active layer** is highlighted in red with thicker lines. For users who prefer **solid mode**, this option can now be applied to layers(planes) in the **Rendering Settings**.

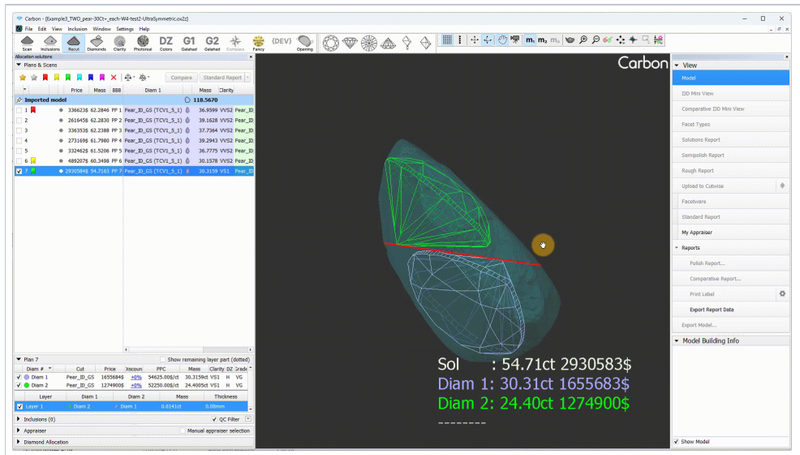


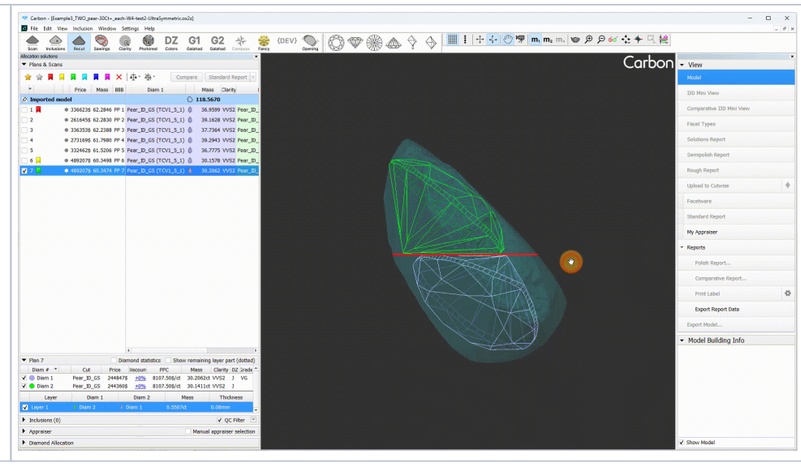


Layer movement improvements

In the new version, the layer movement latency has been significantly reduced. This improvement enables smoother and more precise operation of the **Fast Swim** tool.
Additionally, rotation around the center (when holding the **C** key) has become more intuitive.

Before	Now



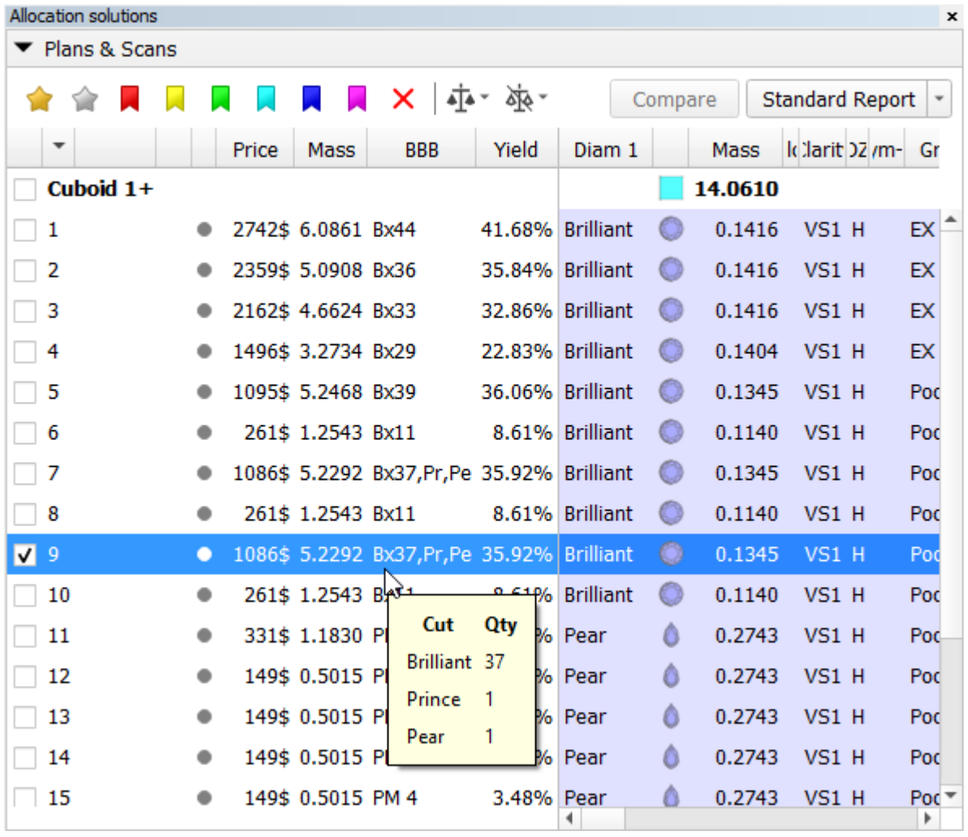


Enhancements for Solutions with a Large Number of Diamonds

Functionality has been implemented to improve the display of information for solutions containing a large number of diamonds.

Changes to the Solution List

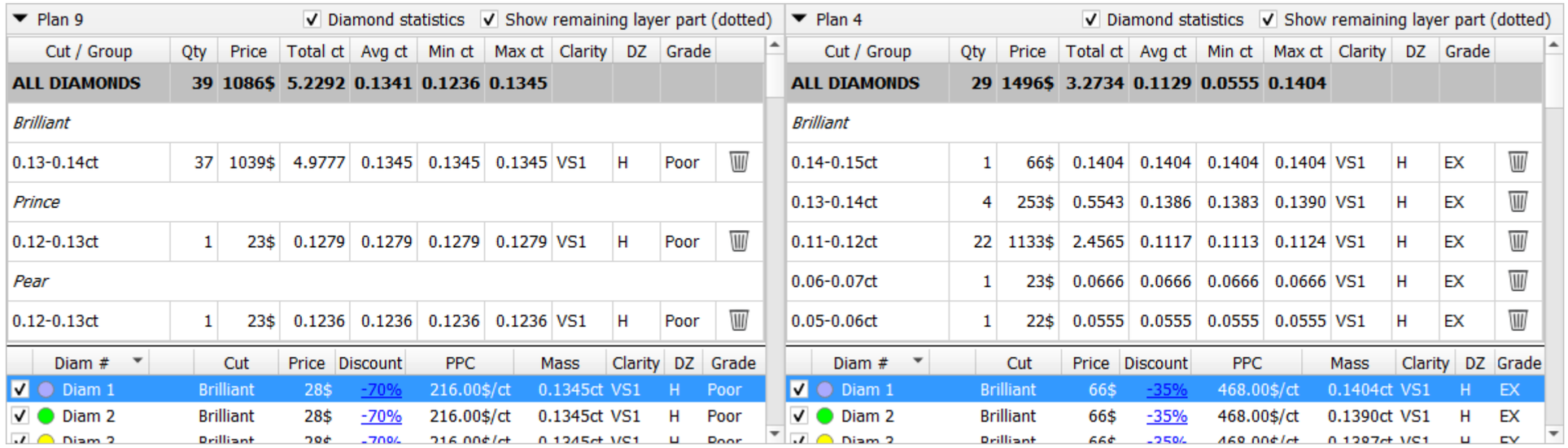
- The display format for solution names has been modified. This change reduces the column width to an acceptable size, ensuring the "Yield" column remains clearly visible.
- A tooltip has been added to display solution details. This tooltip shows the diamond cuts present in the solution and the quantity of diamonds for each cut.



Addition of a Diamond Statistics Table

A Diamond Statistics table has been introduced, which is displayed when the "Diamond statistics" checkbox is enabled.

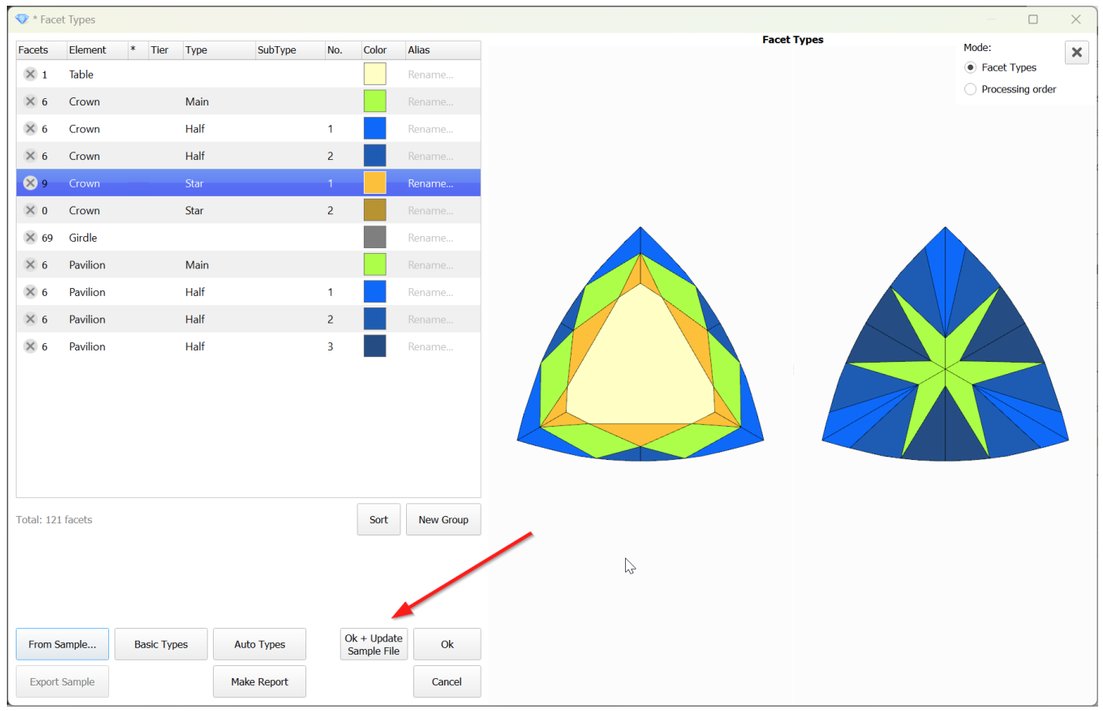
- Automatic Activation: This checkbox is automatically selected when a solution containing 10 or more diamonds is chosen.
- Weight Grouping: For statistical purposes, diamonds are grouped into the following weight categories:
  - Up to 0.30 carats, in increments of 0.01 carats.
  - From 0.30 carats and above, in increments of 0.05 carats.
- Any weight group can be deleted by clicking the corresponding delete button.



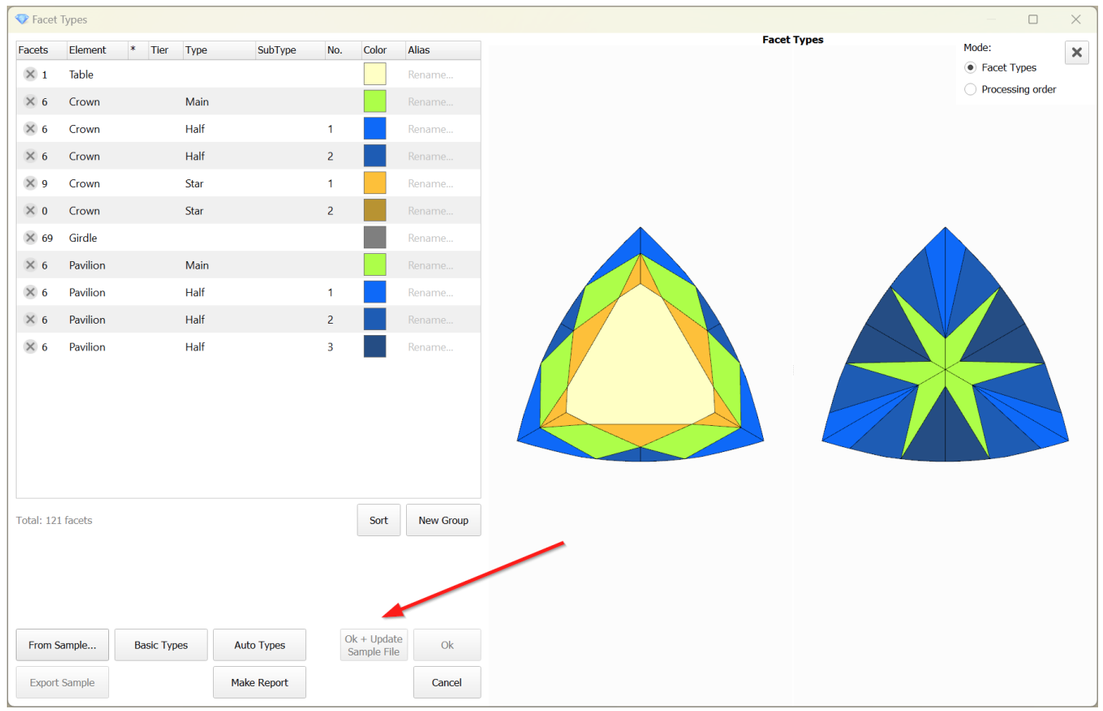
Sample Facet Types

When editing the Facet Types of a sample, the modified types are not saved to the sample file by default. However, this feature proves to be quite useful and convenient. Therefore, this functionality has been implemented.

To save the modified Facet Types to the sample file, the 'Ok + Update Sample File' button is provided.



The button is disabled when the file is unavailable:



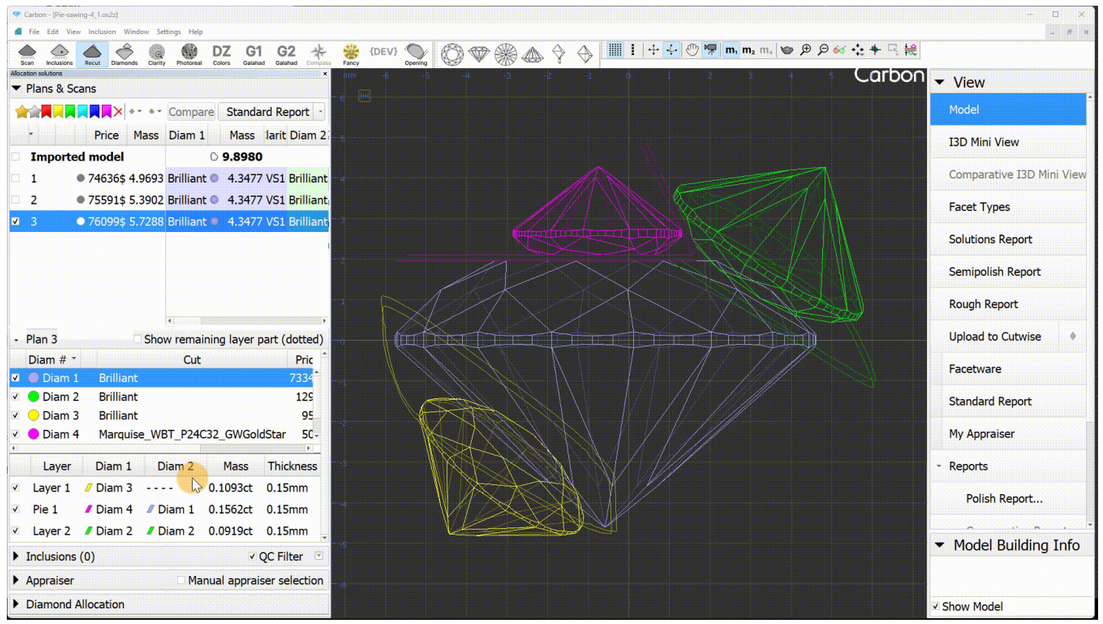
Preplan updates

Preplan Creation Improvements

The preplan creation process has been enhanced and stabilized. The "Create sawing preplan" feature now fully supports half-planes, pies, and shapes, including imported Sarin projects.

New Preplan Creation Methods

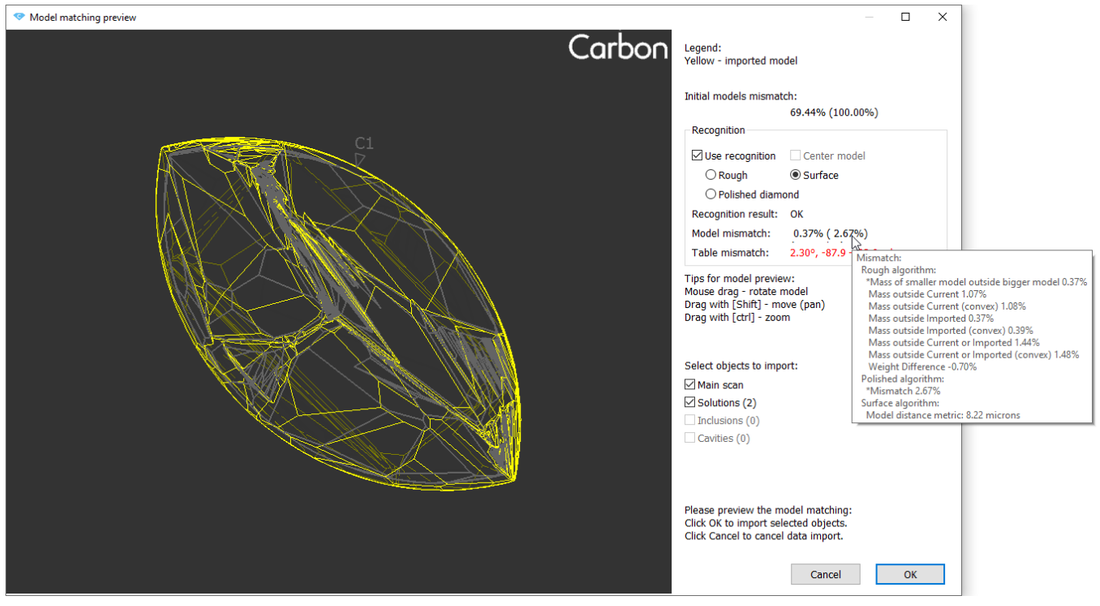
Two additional ways to create a preplan have been introduced: from the layer's context menu, you can select "Make preplan for cutting part" and "Make preplan for part on glue." "Make preplan for cutting part" creates a preplan for the part of the rough that should be cut off by the sawing. Typically, this is a sawing preplan for the diamond being cut. "Make preplan for part on glue," on the other hand, creates a preplan for the remaining rough part. This is the part of the rough, that remains at the glue point after being cut by this layer.



Recognition updates

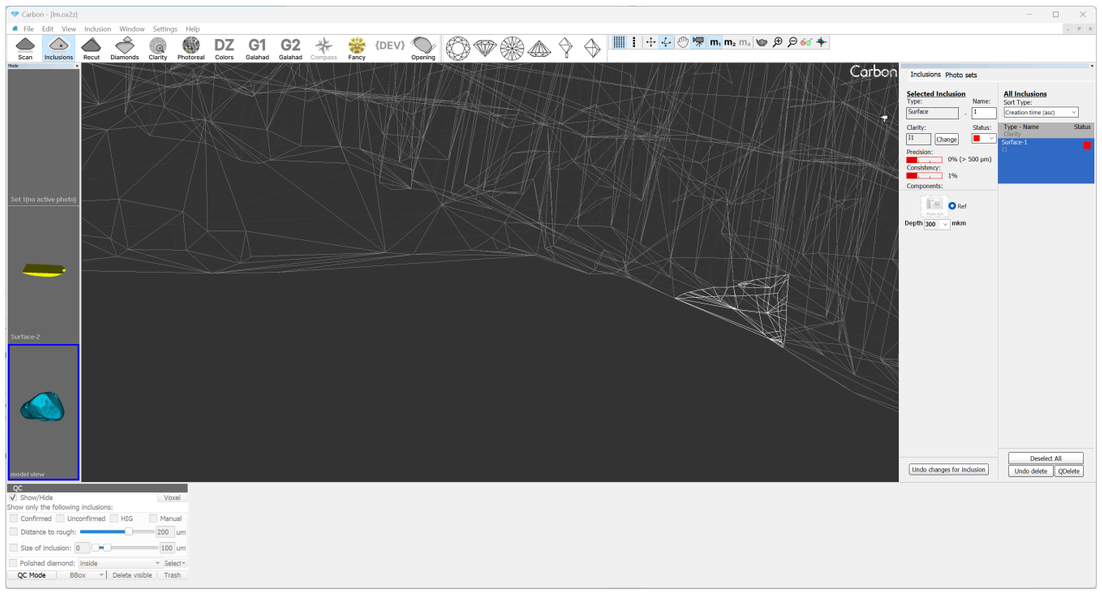
Surface recognition update

- The "Surface" recognition now provides consistent results, regardless of the order in which models are opened or imported.
- A bug affecting recognition has been fixed; it occurred that an imported model was a preplan instead of a scan (this issue raised after unchecking the "Recognition" option).
- Mismatch data for "Surface" recognition is displayed. We've introduced the display of the *Model Distance Metric* value, which roughly corresponds to the average distance between the model's surfaces.

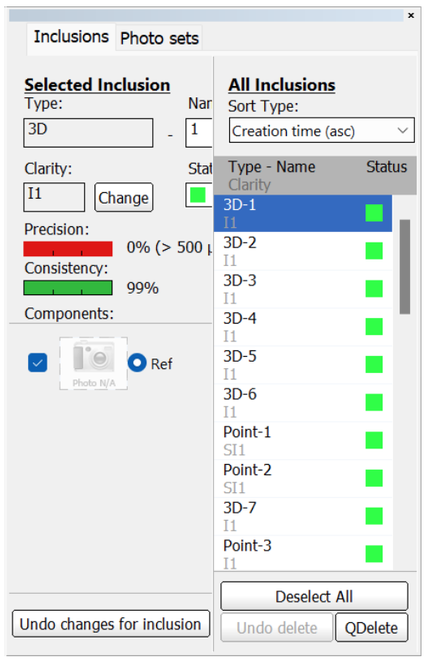


Inclusion Mode improvements

- Batch removal of inclusions has been accelerated;
- Batch set of inclusion status has been accelerated;
- The "Select All Inclusions" context menu operation has been accelerated;
- Fix: the inclusion color status was not updating properly in the right pane of the Inclusion tab;
- Surface inclusions: depth combo box was updated. Now the depth value can be changed using the mouse wheel (like in spin boxes), as well as edited manually.

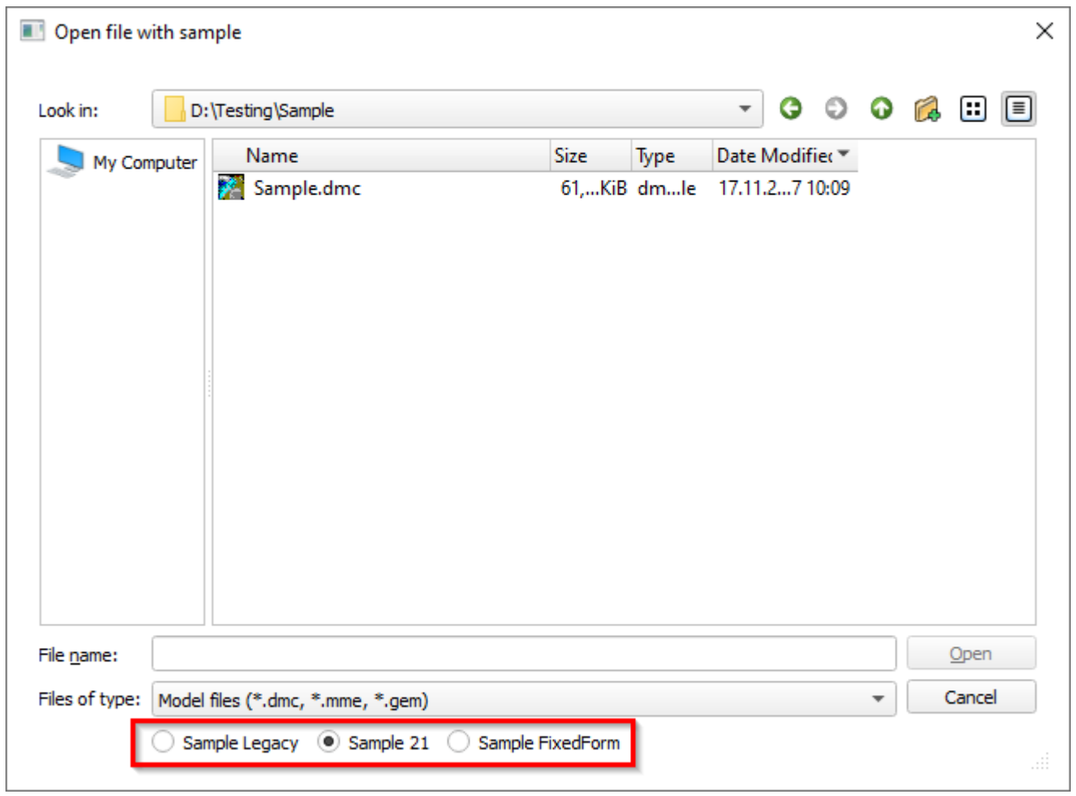


- Resolved an issue where the color status of newly created inclusions was not updating correctly when accessed via the context menu in the list.
- Fixed a problem that prevented the removal of inclusions from the scene in scenarios involving Cracks (with auxiliary inclusions such as deep point.
- Fixed crash when deleting inclusions in a certain scenario and project.
- In the Inclusions mode, the inclusion color statuses were not updating correctly in the list.



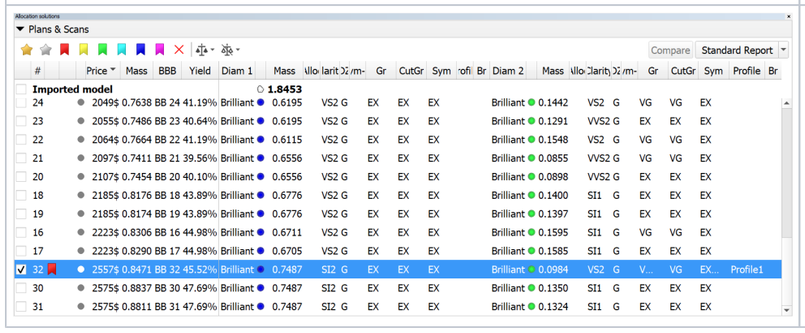
Fixed problems and improvements

- Now the "Open Sample" dialog remembers the selected method, and the next time the dialog is opened, it will be automatically selected.

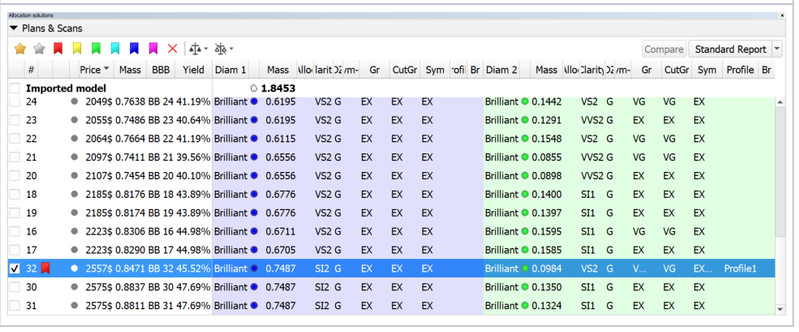


- Solution list. Restored cell background colors in multi-diamond mode.

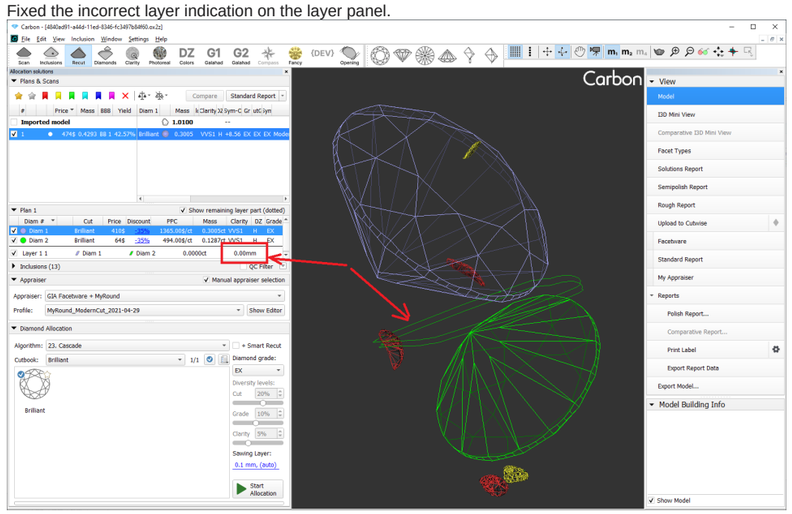
was



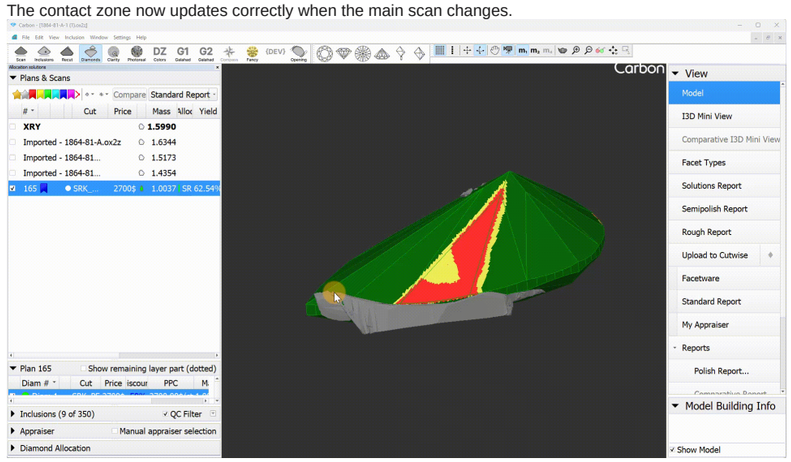
now



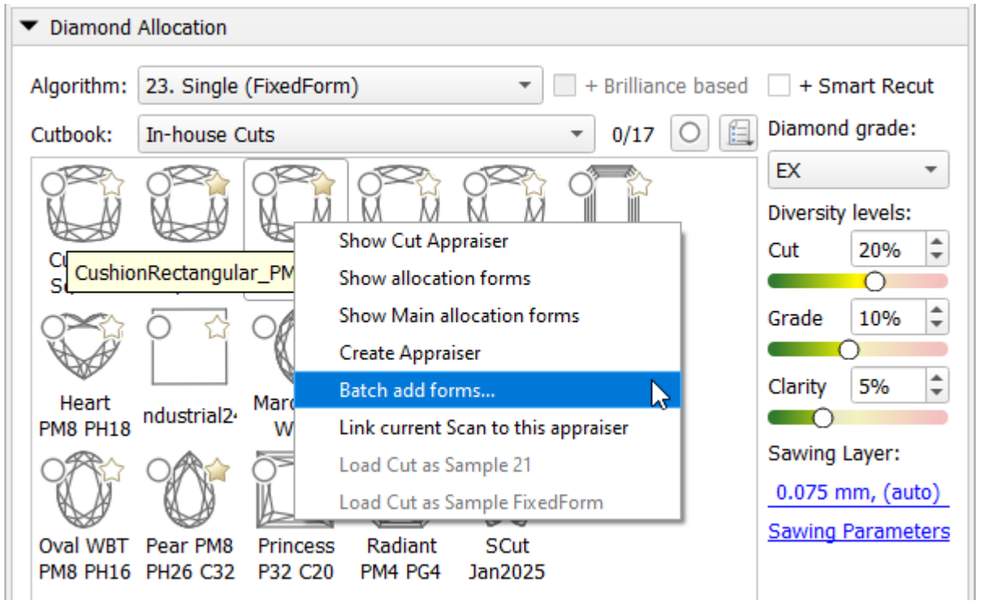
- Fixed the incorrect layer indication on the layer panel.



- The contact zone now updates correctly when the main scan changes.

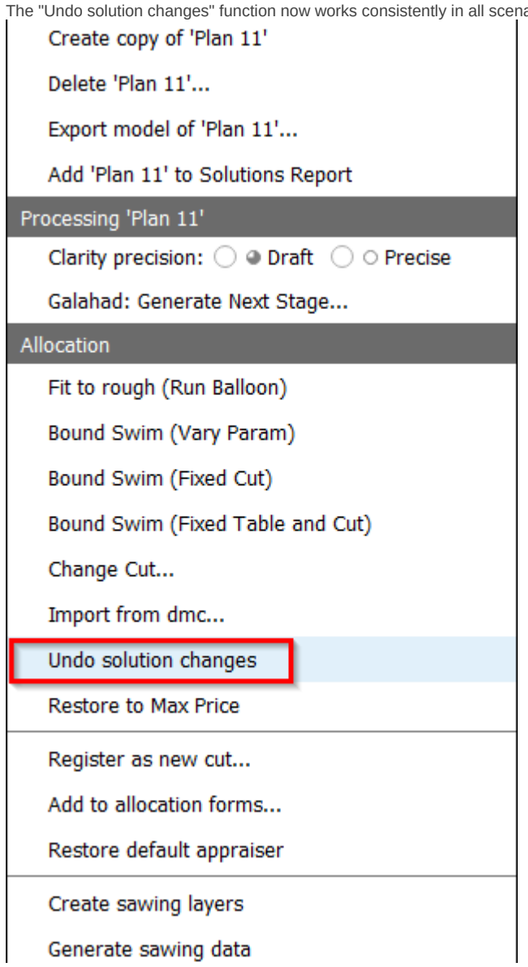


- Layer movements will no longer reset the layer thickness.
- Improved facet marking transfer stability during "Batch add forms..." command. Fixed facet marking transfer bugs that made some forms unusable

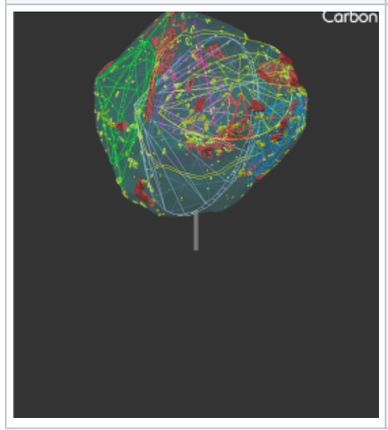
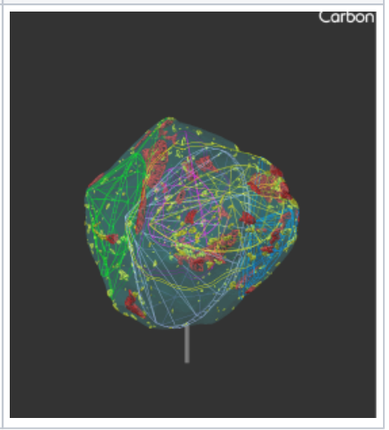


- SmartNormalize algorithm is improved for complex non-convex cuts.
- Uploading data to Cutwise is significantly accelerated
- The pop-up window for the "Change layer thickness" command now correctly:
    - Responds to the **Esc** key
    - Handles **default values** properly when opened
- Fixed an issue where right-click + mouse wheel would move objects instead of zooming when object movement mode was active

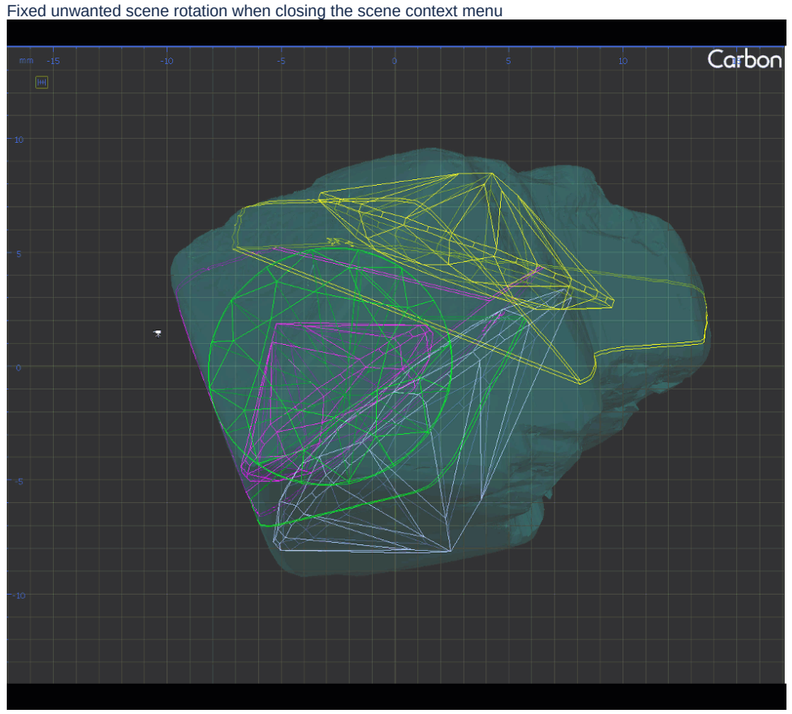
- The "Undo solution changes" function now works consistently in all scenarios, including when any layer is selected in the solution.



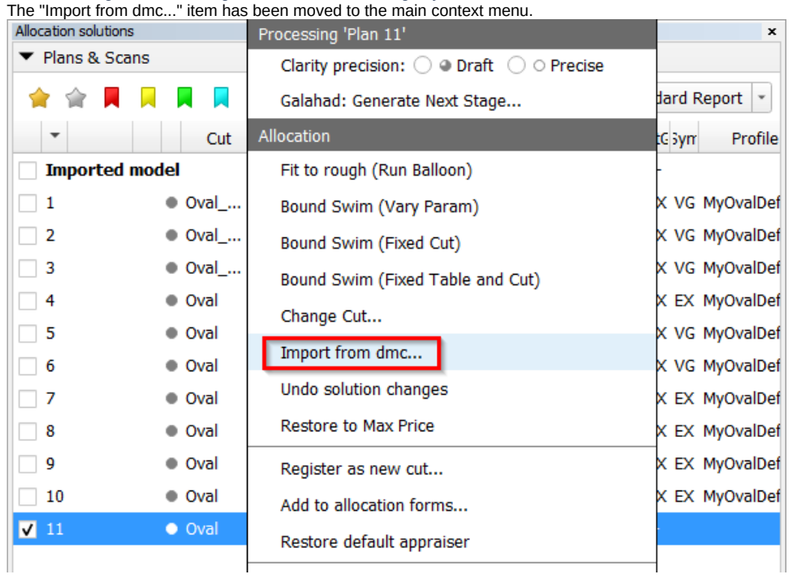
- Glue Point Orientation button now centralizes the solution

Before	Now
	

- Fixed unwanted scene rotation when closing the scene context menu

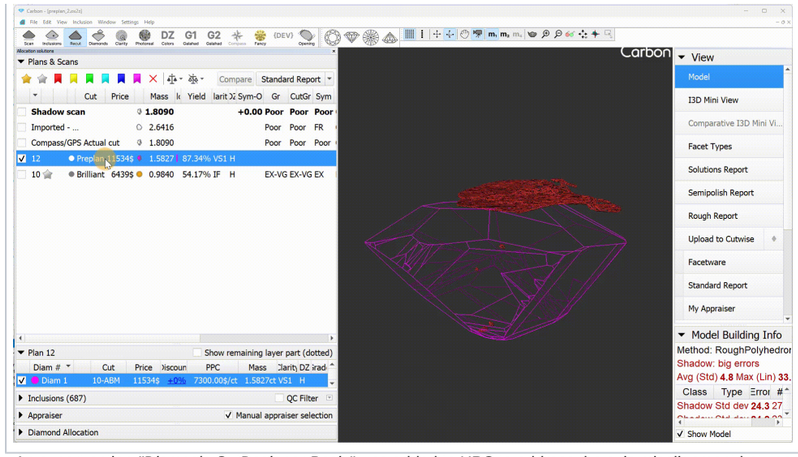
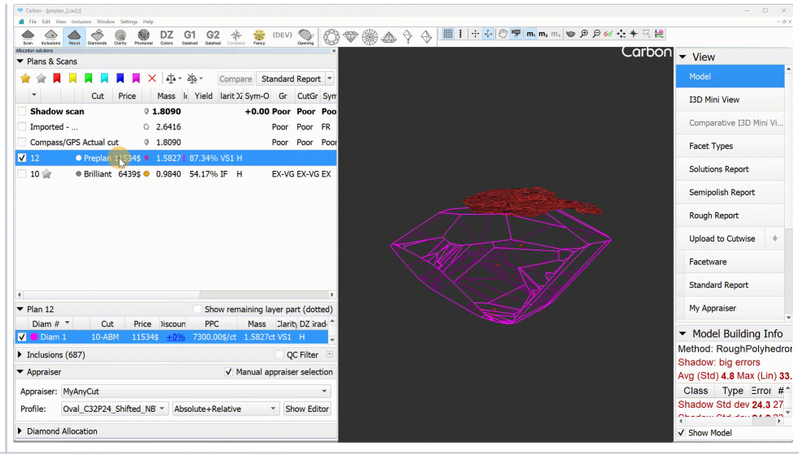


- Facet Types no longer disappear during certain actions as before:
  - Adding/deleting a layer.
  - Using "Create Sawing Data" or "Create Sawing Layers".
- The "Import from dmc..." item has been moved to the main context menu.

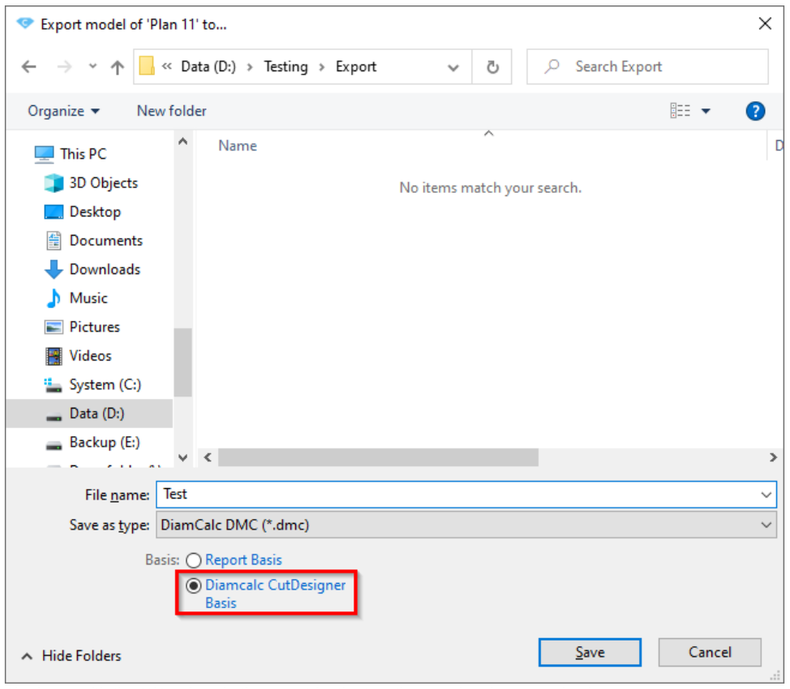


- Fixed the copying of preplans. Now, a copied preplan remains a preplan.

was	now

- An export option *"Diamcalc CutDesigner Basis"* was added to HPC to address the axis misalignment between HPC and CutDesigner. Previously, DMC files exported from HPC used a coordinate basis where pear-shaped diamonds were oriented nose-down, whereas CutDesigner expects the orientation to be right-facing.



- The issue with the N/A values in the report for the two-tier pear has been resolved.

Parameter	Avg	Min	Max	Dev	Cut Grade	Sym Grade
Ratio (L/W)	1.501	–	–	–	N/A	–
Width, mm	5.212	–	–	–	–	–
Length, mm	7.820	–	–	–	–	–
Diameter, mm	–	5.211	7.820	2.608	EX	–
Crown angle, °	34.48	N/A	N/A	N/A	EX	N/A
Crown SilverStar angle, °	21.82	21.37	22.27	0.90	N/A	N/A

Parameter	Avg	Min	Max	Dev	Cut Grade	Sym Grade
Ratio (L/W)	1.501	–	–	–	N/A	–
Width, mm	5.212	–	–	–	–	–
Length, mm	7.820	–	–	–	–	–
Diameter, mm	–	5.211	7.820	2.608	EX	–
Crown angle, °	39.19	38.91	39.48	0.56	FR	N/A
Crown SilverStar angle, °	21.82	21.37	22.27	0.90	N/A	N/A