

A large graphic consisting of two blue triangles meeting at a diagonal line that runs from the bottom-left towards the top-right. The triangle on the left is a darker shade of blue, while the triangle on the right is a lighter shade.

**materialise**

innovators you can count on

# Materialise Mimics

Version 25.0

Release Notes

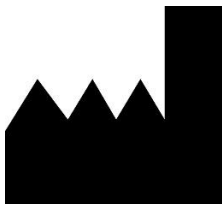


## Regulatory Information

The Mimics Innovation Suite software version 25.0 (released in 2022) consists of the components Materialise Mimics 25.0 and Materialise 3-matic 17.0.

Materialise Mimics 25.0 is not a medical device. Any reference that is made to the design of medical devices within the Materialise Mimics 25.0 user documentation (including user guides or tutorials) refers to a research context.

Usage of the software signifies your acceptance of the above.



**Manufactured in June 2022 by**

Materialise NV

Technologielaan 15

3001 Leuven, Belgium

Phone: +32 16 39 66 11

[www.materialise.com](http://www.materialise.com)

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## 1. What's New

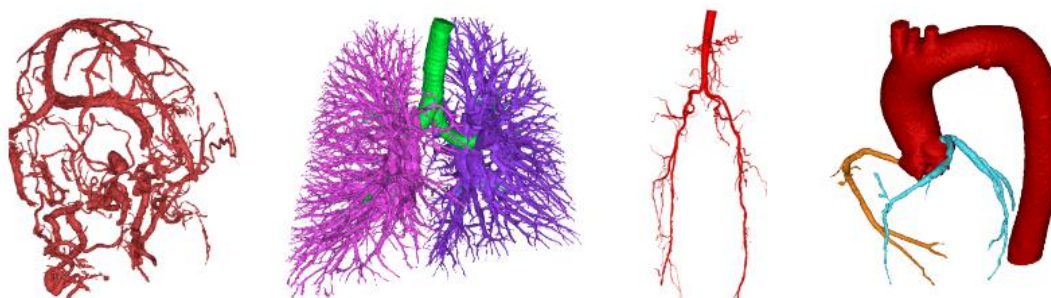
### General

This Release Notes document is intended for customers who were previously using Mimics software. All the new features, as well as minor changes and known issues of Materialise Mimics 25.0 version, are described in this document.

Materialise Mimics 25.0 introduces many exciting new and improved features to facilitate in accelerating the whole segmentation process.

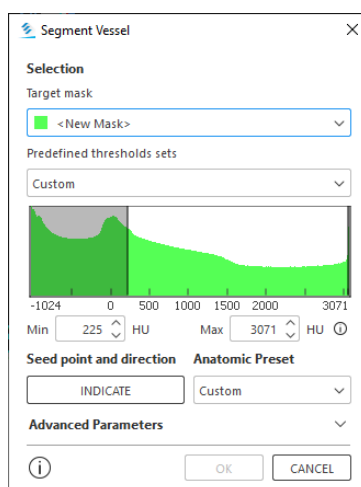
### Segment Vessel tool

With Segment Vessel, you can semi-automatically create masks containing single vessels or complex vessel structures on a wide variety of anatomies. The tool adds the segmented vessels to a new or existing mask after you define a threshold range containing the desired vessels and a starting point. You can select one of the provided vessel presets to quickly segment certain anatomies or fine-tune the available advanced parameters to segment other regions of interest that contain blood vessels.



For large datasets, we recommend **disabling 3D Mask Preview** while fine-tuning the Threshold window to prevent performance issues.

To use the tool on basic cases, selecting a threshold window containing the desired vessel and indicating the start of the segmentation should suffice:



For more complex cases, you can obtain a result by selecting an appropriate **Anatomic Preset**. These presets tune the Advanced Parameters and have been optimized for certain regions of interest.

If you wish to segment other regions of interest, your case may benefit from fine-tuning of these parameters. You can open the **Advanced Parameters** section of the dialog by opening its drop-down menu. We strongly recommend reading our User Guide article for the Segment Vessel tool, which explains into detail each parameter and gives advice for fine-tuning.

## CT Heart

The CT heart tool in Mimics has been updated. Several changes were implemented:

### **New algorithm for Automatic mode:**

The Algorithm for the automatic mode of CT Heart has been replaced. The older algorithm, which was atlas-based, has been replaced with a new, AI-based segmentation algorithm that offers increased accuracy on the Left Heart and especially Right Heart regions. The new algorithm also offers more flexibility to choose which regions to segment. Additionally, the new algorithm offers segmentation of the Myocardium, which was previously not available.

### **Mesh generation for the new algorithm**

The updated CT Heart algorithm will provide masks that accurately outline the requested anatomy. To make sure this remains the case after mesh generation, it is advised to use the setting 'Voxel' under the 'Threshold' option in the Part Calculation dialog. Due to the fact that the threshold values displayed for the mask in the PM tab are calculated after the mask was generated using the AI-based method, the mask-based threshold option that is selected using the 'Optimal' method may yield suboptimal results.

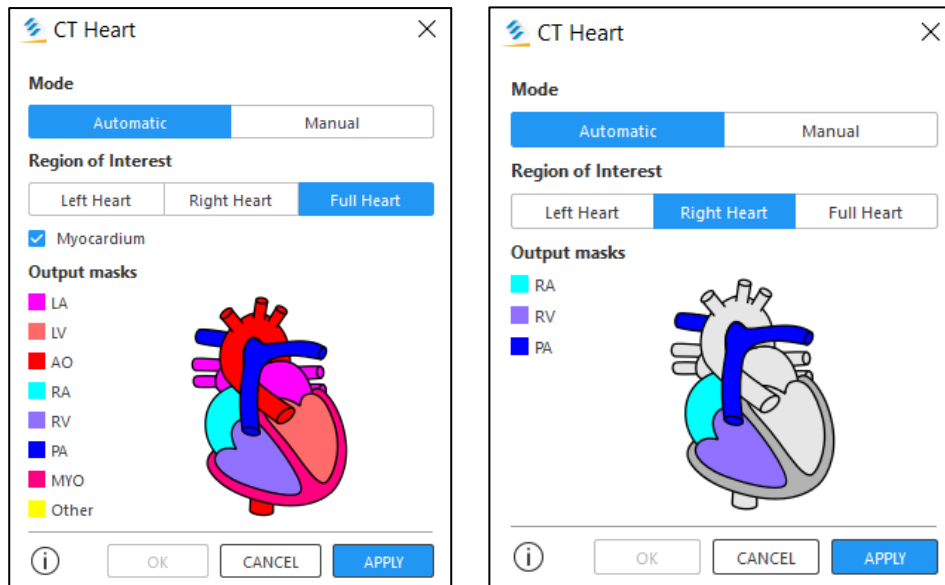
### **Updated UI for Automatic mode:**

The User Interface for the Automatic mode has also seen several changes to conform with the new capabilities of the AI-based algorithm as well as to make the interface more intuitive:

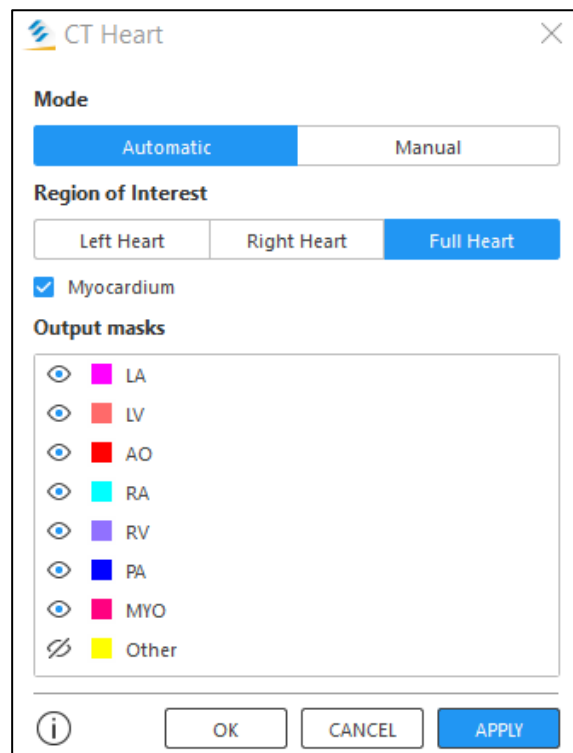
The interface now has the option to choose the Right Heart mode for automatic segmentation, next to the previous Left Heart and Full Heart modes.

The dialog contains a checkbox (for automatic mode only) that allows you to segment the Myocardium

The dialog contains a list of expected masks as well as an illustration to make it immediately clear which regions of the heart you can expect to receive when performing an automatic segmentation



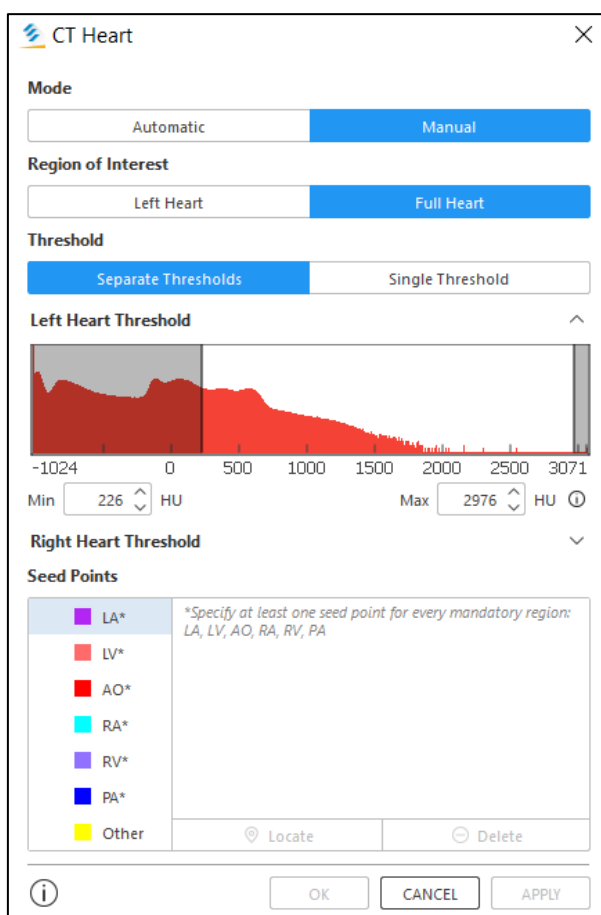
After the automatic segmentation is performed, you can now preview multiple masks at the same time, before adding the results to your project. You can switch on/off the preview for individual regions by using the visibility icons in the dialog. This additional capability allows you to preview the interface between the different regions before deciding to accept the results or not.



### Updated UI for Manual mode:

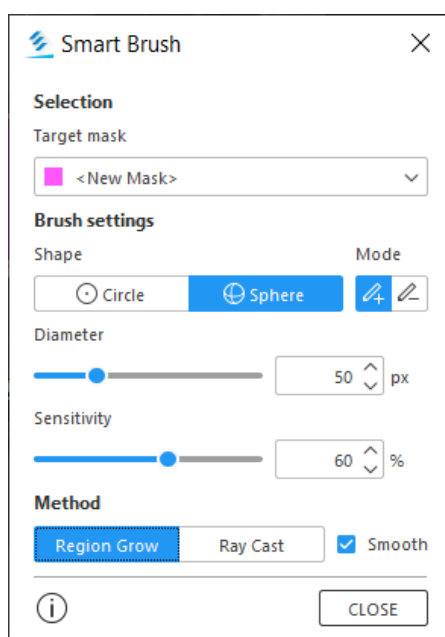
The manual mode interface was also slightly altered to make the placement and management of seed points more user-friendly. The table that contains the seed points was simplified to have only vertically oriented tabs that represent for which region seed points will be placed. Selecting a tab and thus corresponding region will immediately allow you to start placing seed points without pressing the “+” button and the “Locate” and “Delete” buttons were made more prominent for easier access.

Seed point sizes are now remembered so if you reduce or increase the size of a seed point, all subsequently placed seed points will have the same size as well.



### Smart Brush tool

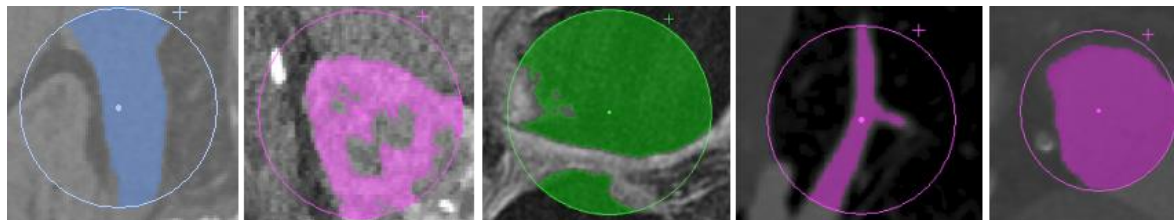
This tool allows you to edit an existing mask or create a new one by marking slices on the 2D images with a pixel intensity-sensitive brush. The brush automatically segments adjacent slices within a spherical radius to obtain a 3D mask, which will help you to segment different anatomy types faster.



The Smart Brush tool allows you to see a preview of voxels which will be added to or removed from the mask by hovering over the image data.

The shortcut **Ctrl+Shift+Left Mouse** can be used to adjust the Sensitivity parameter. The tool can be opened via the shortcut **Alt+S**.

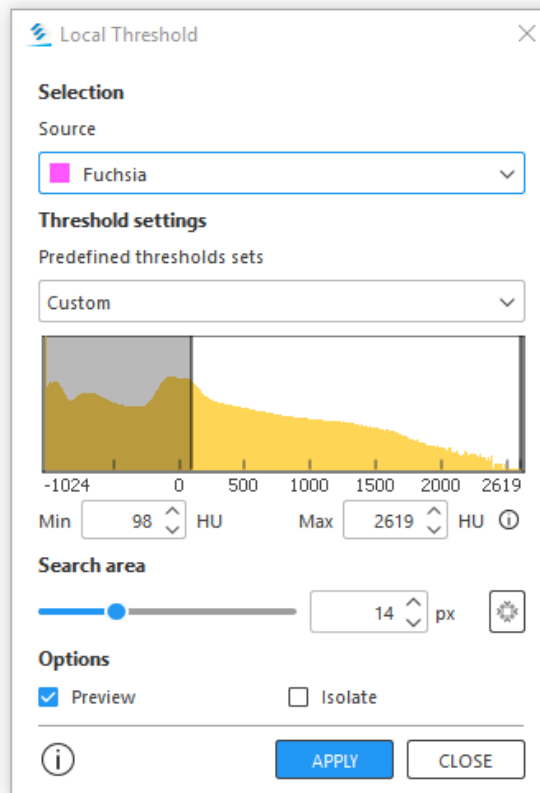
Examples of marking preview on different anatomies:



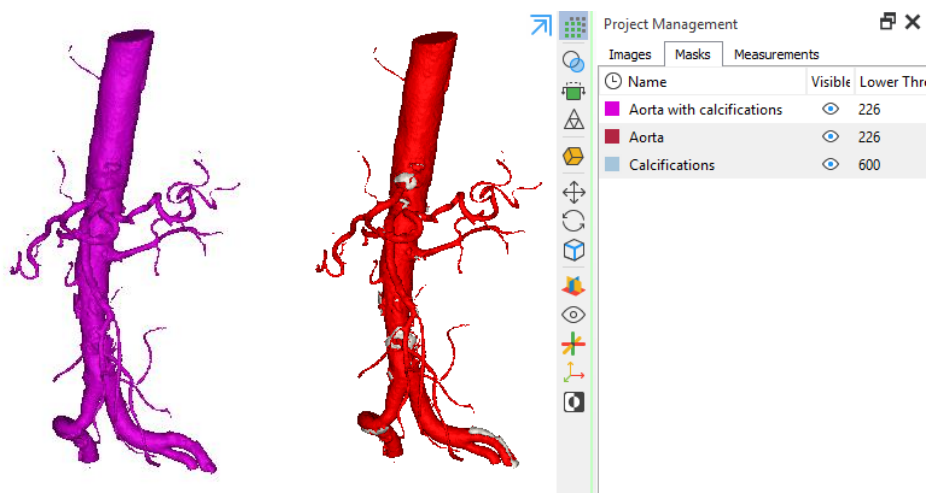
## Local Threshold tool

Local Threshold is a tool that allows you to improve segmentations by thresholding in a limited zone directly attached to an already existing mask. You can enlarge or change the thresholding range to separate an extra anatomy (like calcifications on segmented vessels, implants, etc.), as well as narrow the thresholding range to make segmentations more detailed and remove pixels with incorrect density. This tool also improves segmentation on images with scatter as you can under segment with an initial threshold and then use the Local Threshold tool to segment a larger threshold range locally.

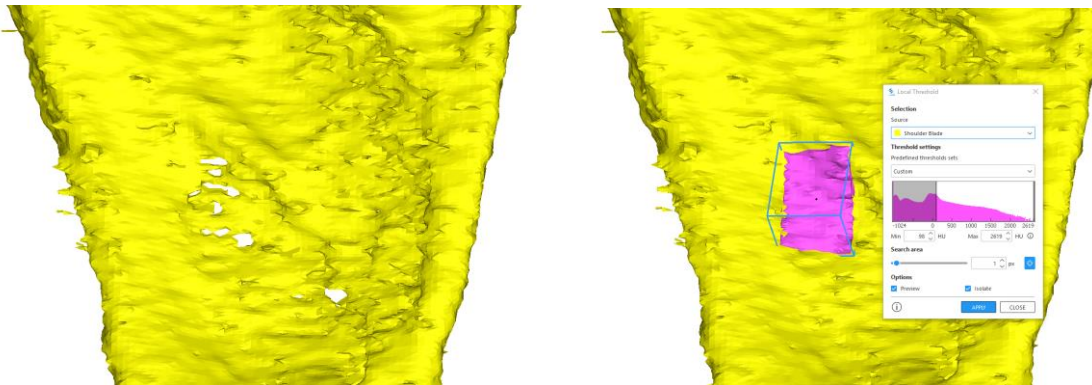




Example of Local Threshold tool used to separate calcifications from a mask containing the aorta:



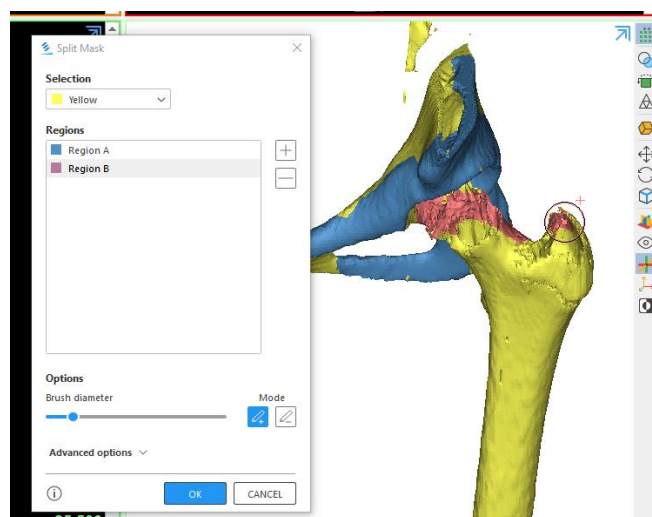
The Local Threshold tool also has a bounding box which allows you to limit the area to which the tool is applied to a sub-region of the selected mask.



## Split Mask in 3D

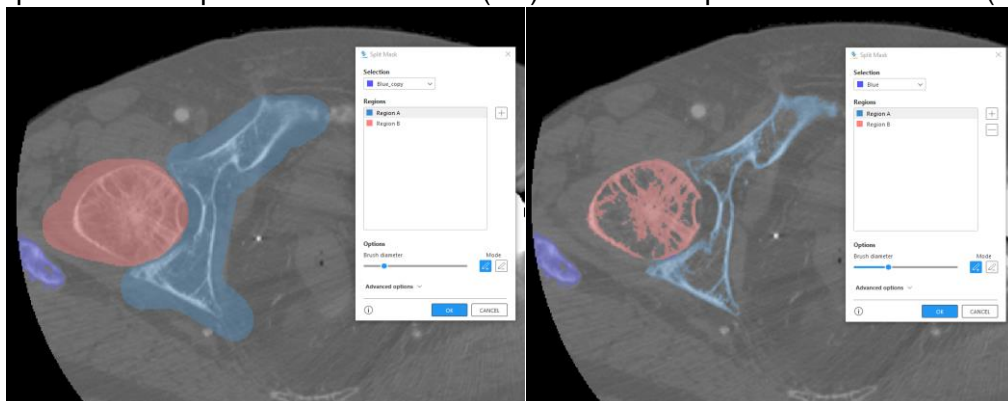
Two improvements were made for the Split Mask tool:

1. Support for marking regions in the 3D viewport if 3D mask preview is turned on. The marked regions are shown in both 2D and 3D viewports



2. The marked regions shown on the previews are now also limited to their intersection with the selected mask.

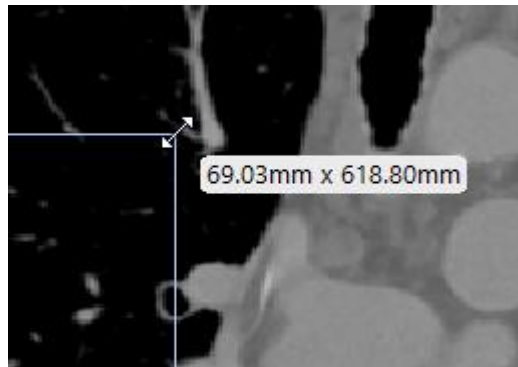
Comparison of old preview in Mimics 24 (left) versus new preview in Mimics 25 (right)



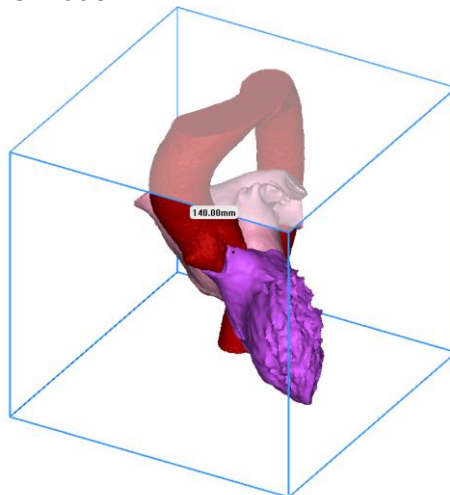
## Editable Bounding Box in 3D

For the **New Mask**, **Threshold (Global and Local)**, **Crop Mask** and **Edit Mask** tools the next improvements were made:

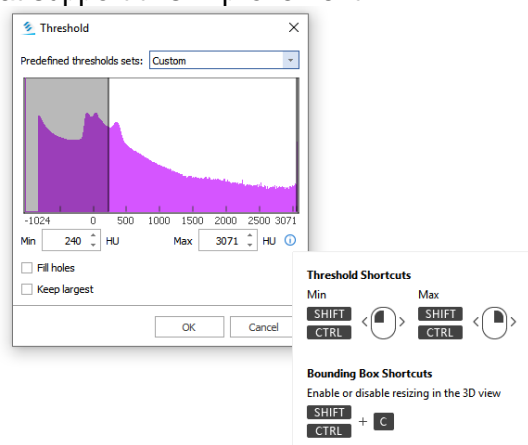
1. When the user resizes the bounding box, the measurement label of the editing cube face will be shown near the cursor. This can be disabled in the Preferences under the Visualization tab:



2. Resizing bounding box in the 3D view is now possible via using shortcut **Ctrl+Shift+C** to enable or disable this mode:



The info button of the Threshold Window of New Mask and Global Threshold tools contains a reminder of the shortcut. A hint is also displayed in the Log upon opening one of the tools that support this improvement.

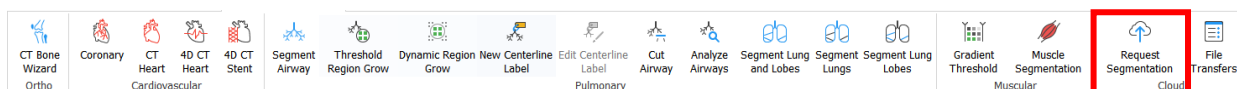


## Improved link with the cloud (Mimics Viewer)

As part of the Mimics 25 release, the link between the Mimics desktop application and the Mimics Viewer platform has been improved. This means you will now be able to upload your projects to the cloud, request automatic segmentations and share projects with other users, directly from the Mimics desktop application.

### Request a segmentation:

To request an automatic segmentation, a new button (Request Segmentation) was added to the 'Advanced Segment' ribbon:



When this button is pressed, the currently opened mimics project is automatically anonymized and uploaded to the Mimics Viewer platform. An internet browser will then open and you shall be asked to enter your credentials to login to the Mimics Viewer platform. After login, you are taken to a new screen in the Mimics Viewer platform that allows you to select the desired segmentation algorithm:

### PLEASE SELECT THE SEGMENTATION ALGORITHM FOR GC\_46100753.MCS

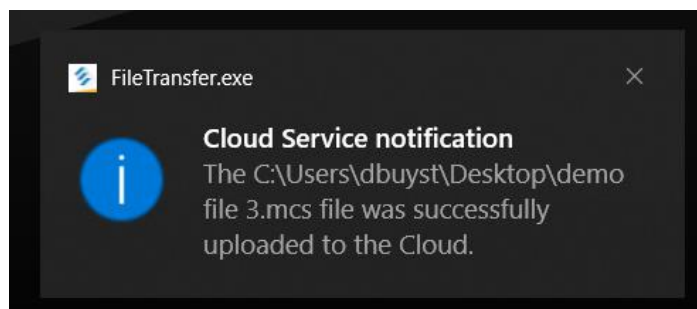
Your available tokens: 606

Algorithm	Cost	Actions
CMF CT	14 tokens	<a href="#">Request Segmentation</a> ⓘ
Heart CT	28 tokens	<a href="#">Request Segmentation</a> ⓘ
Knee CT	10 tokens	<a href="#">Request Segmentation</a> ⓘ
Knee MRI (left)	16 tokens	<a href="#">Request Segmentation</a> ⓘ
Knee MRI (right)	16 tokens	<a href="#">Request Segmentation</a> ⓘ
Automatic Bone CT	16 tokens	<a href="#">Request Segmentation</a> ⓘ

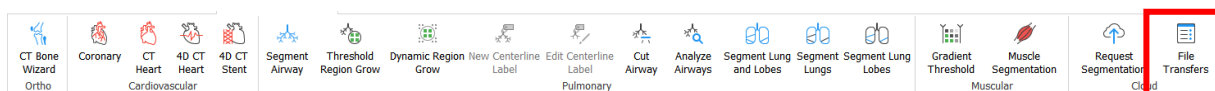
Once you have selected a segmentation algorithm, a case is automatically created on the Mimics Viewer and the segmentation begins.

After the segmentation request is made, you can return to Mimics and continue your work while your segmentation is performed on our cloud servers.

You will receive an automatic notification in the Windows notifications center to inform you when the upload of your file to the cloud was successfully performed:



You can also press the “File Transfers” button in the Advanced Segment ribbon to open a separate dialog that allows you to examine a history of all previous requests and their status in a tabular overview.



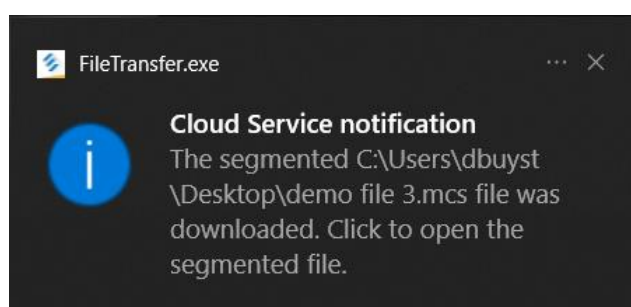
In case there are any issues with the anonymization, upload, segmentation or download they shall also appear in this table.

Materialise Mimics 25.0 - Cloud File Transfer

	File Name	Request Type	Upload ID	Date of Upload	Date of Status Update	Status	
1	Femur.mcs	Segmentation	6e6c2840-5e4b-4650-a232-0658d311fd20	10-juni-2022 10:40:47	10-juni-2022 10:40:47	Uploaded	Add
2	Shoulder.mcs	Segmentation	5976ebb5-938f-4acb-aeab-495e11bd23b9	10-juni-2022 10:36:40	10-juni-2022 10:37:20	Segmentation in progress	Add
3	Hip.mcs	Segmentation	bcc95d36-c80d-4852-ae9f-72be65506183	10-juni-2022 10:36:05	10-juni-2022 10:49:59	Downloaded	Add
4	EM 22 004.mcs	Segmentation	0495e15f-af29-4108-929d-81f664f87c66	10-juni-2022 10:35:12	10-juni-2022 10:50:03	Downloaded	Add

Close

Once the segmentation is completed, you shall receive a notification in the Windows notifications center. The segmented result, meanwhile, is automatically downloaded to your pc.

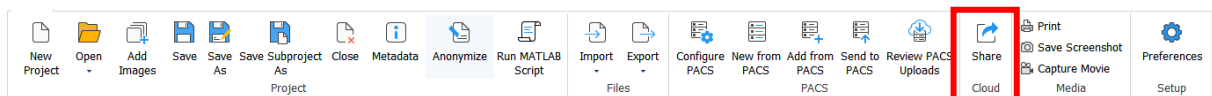


You can then inspect the results of the segmentation by pressing the “Add” button in the File Transfer window. This will trigger an import of your segmented models (masks and mesh objects) into the original file for which a segmentation was requested.

The file transfer window can be opened manually from the ribbon or by clicking on the notification that informs you of a successful segmentation.

### Share a file:

To share a file via the Mimics Viewer platform from within Mimics, a new button (Share) was added to the ‘File’ ribbon:



When this button is pressed, the currently opened mimics project is automatically anonymized and uploaded to the Mimics Viewer platform. An internet browser will then open, and you shall be asked to enter your credentials to login to the Mimics Viewer platform. After login, you are taken to a new screen in the Mimics Viewer platform that allows you create a case with the desired metadata:

Personal sensitive information should not be entered!

\* Case Title

Requester

Anatomy

Due Date

Additional Info

[Add New Case](#)

Alternatively, the same screen also allows you to select an existing case from a list, to add the project to. Press the “Add” button to add the project to the corresponding case.

Select an existing case to add 'demo file 3.mcs'

Case ID	Case Title	Requester	Anatomy	Creation Date	Creator	Shared With	Files Uploaded	Files Left	
SC22-JIL-NAK	demo case			02 February 2022			1	999	<a href="#">Add</a>
SC22-D0C-RAS	Wrist		Wrist	28 January 2022			1	999	<a href="#">Add</a>



The File Transfer window (found in the 'Advanced Segment' tab) will also show the status of any shared file.

## CT bone segmentation algorithms

A suite of new segmentation algorithms was added to the Cloud Segmentation offering. These algorithms can be accessed by logging in to the Mimics Viewer platform manually or by requesting a segmentation from within Mimics (see previous section).

The newly added algorithms are the following:

- CMF CT
  - o Replaces the previous CMF segmentation algorithm, which is now renamed to 'CMF CBCT'
  - o Segments the following regions: Upper skull, Mandible, Upper teeth, Lower teeth, Hyoid
- Spine CT
  - o Segments the following regions: Vertebrae, Sacrum, Coccyx, Ribs, Sternum
- Shoulder CT
  - o Segments the following regions: Scapula, Humerus, Clavicle
- Hip CT
  - o Segments the following regions: Pelvis, Femur, Sacrum
- Knee CT
  - o Replaces the previous knee segmentation algorithm
  - o Segments the following regions: Femur, Patella, Tibia, Fibula, Talus, Navicular, Calcaneus, foot (remaining foot bones)
- All bones CT
  - o Segments the following regions: Calcaneus, clavicle, femur, tibia, fibula, foot (remaining foot bones), pelvis, humerus, hyoid, upper skull, mandible, upper teeth, lower teeth, navicular, patella, ribs, sacrum, coccyx, scapula, vertebrae, sternum, talus, metal

The new algorithms can segment adult CT scans in a wide range of FOVs containing bone and/or metal implants. The algorithms were designed to process the widest possible range of



CT scan orientations, Field of view sizes and overall scanning protocols. For more details on the capabilities of the algorithms, please consult the technical description documents which are available either in the Help section of the Mimics Viewer or via the link available on the algorithm selection screen.

Algorithm	Cost	Actions
CMF CBCT	14 tokens	Request Segmentation ⓘ
CMF CT	14 tokens	Request Segmentation ⓘ
Heart CT	28 tokens	Request Segmentation ⓘ
Spine CT	30 tokens	Request Segmentation ⓘ
Shoulder CT	10 tokens	Request Segmentation ⓘ
Hip CT	15 tokens	Request Segmentation ⓘ
Knee CT	10 tokens	Request Segmentation ⓘ
Knee MRI (left)	16 tokens	Request Segmentation ⓘ
Knee MRI (right)	16 tokens	Request Segmentation ⓘ
All bones CT	50 tokens	Request Segmentation ⓘ

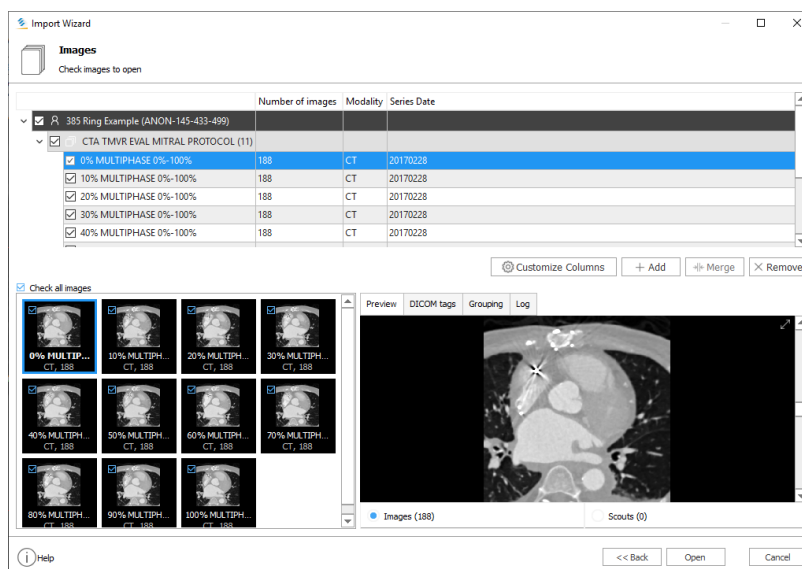
## Improved Phase Sorting in Import Wizard

The sorting of image series has been improved in Mimics 25.0. It now supports sorting based on (cardiac) phase percentages during import. The phase percentage information is read from the DICOM and Mimics will sort the image series in the correct order.

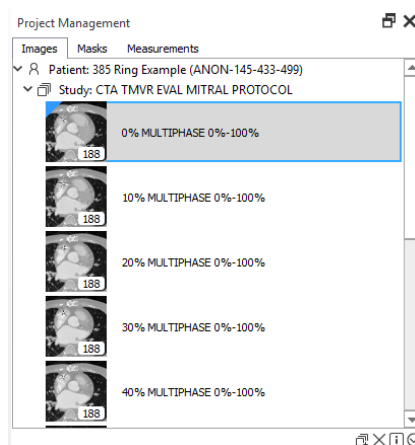
Following DICOM tags are checked in order of priority. If a value is found in a higher priority tag, the remaining tags are not checked for that image series.

- Nominal Percentage (0020, 9241)
- Scan options (0018, 0022)
- Series description (0008, 103E)

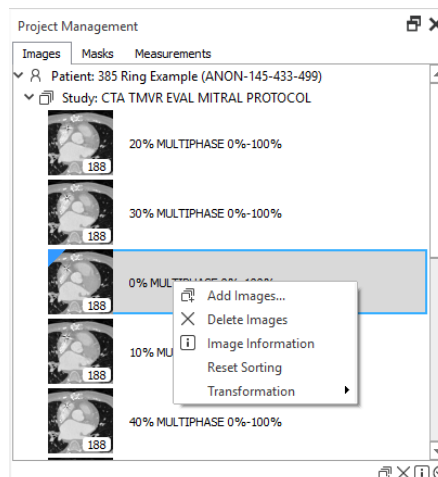
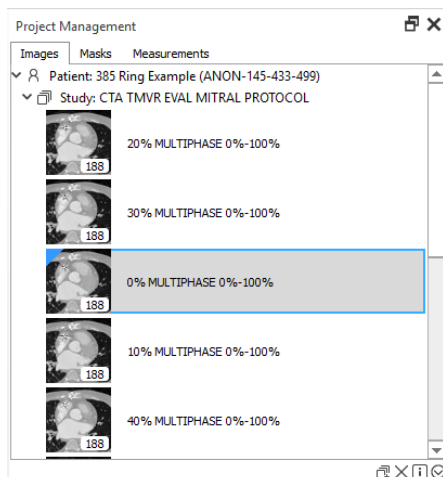




Upon import, the percentages are added to the name of the series. This naming is kept and displayed in the Images PM Tab. If you would like to change the name of a Series, you can do so by double-clicking the Series name in the Images PM Tab.

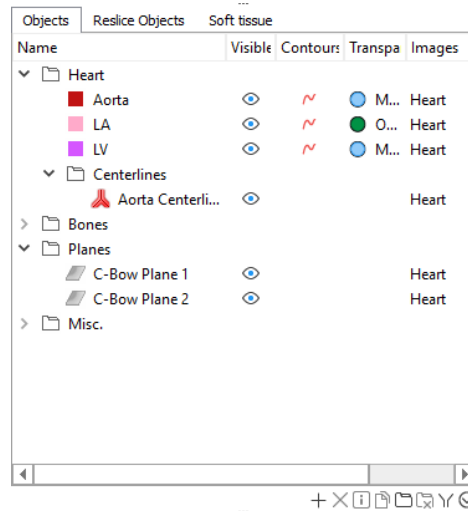


An additional improvement to the sorting of images is that you can now drag-and-drop image series and sort them manually in any order in the Images PM Tab. A new “Reset Sorting” button to return to the default sorting that was set during import is added to the Images PM Tab Context Menu.



## Group Objects in PM Tab

The Objects PM tab now contains a new type of object – Groups.



The Group object can help you to organize objects in a project by arranging them into a tree-like structure. You can move single or multiple objects, as well as the whole group with all its content at once. These movements can be done between different groups, on different levels of the multi-level structure, etc.

Groups are collapsible, can be renamed, have 'show all' and 'hide all' functionality and support most of the functionality available for standard objects like duplication and deletion of the entire group.

Furthermore, objects can be added to new groups via the Context Menu or moved between existing groups with drag-and-drop functionality which enables arrangement of your PM Tab in a comfortable way.

Inter-compatibility for Groups from Mimics and 3-matic is available as follows:

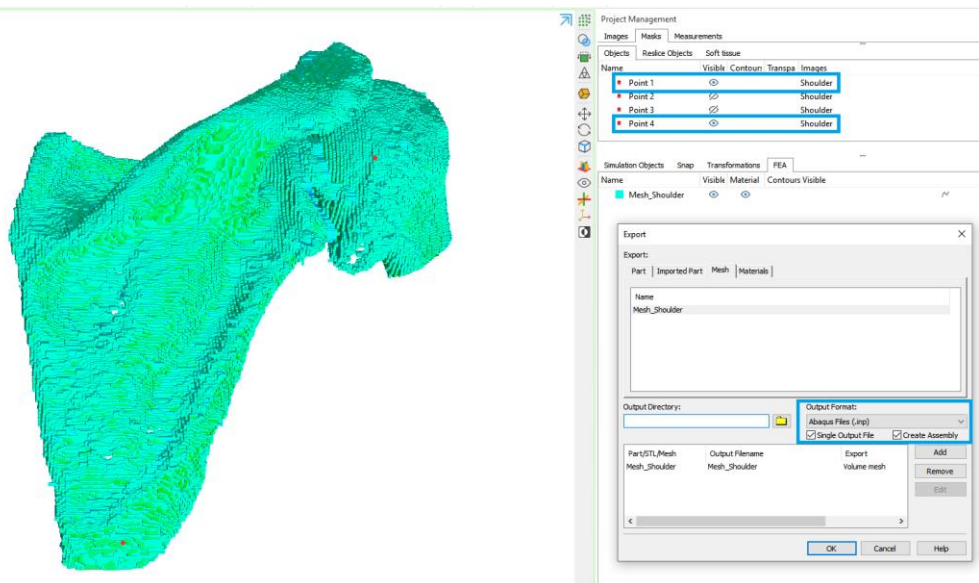
- **3-matic → Mimics:** You can bring a 3-matic group to Mimics by using copy-paste. Press Ctrl+C on the group(s) in 3-matic and then import them by pressing Ctrl+V in Mimics. Import of groups by opening 3-matic project files (.mxc) in Mimics is unfortunately not supported.
- **Mimics → 3-matic:** You can bring a Mimics group to 3-matic by opening the Mimics Project File (.mcs) in 3-matic. Copy-paste of a Mimics group to 3-matic via shortcuts is unfortunately not possible.

## FEA export – Restored compatibility with Abaqus®

To restore and improve our compatibility with Abaqus®, two major improvements have been implemented:

- Mimics point objects are now exportable for use in Abaqus® via the .inp export format offered for Parts, Meshes and Materials. These points will be re-created in the Abaqus® software upon import.
- To export points along with your Parts or Meshes (with or without assigned Materials), enable the Single Output File and Create Assembly options for the Abaqus® Files (.inp) Output format.

- The exported .inp file will contain all points that are currently visible and unlinked to any images or linked to the active image stack.



- Part, Mesh and Material names that cause compatibility issues are automatically corrected during export (.inp) file generation. These objects remain unchanged in Mimics but will have characters that violate the naming conventions used in Abaqus® replaced by an underscore upon importing them in Abaqus®.

Please note that there are a few rare scenarios in which the automatic correction of names does not solve the compatibility issues, namely object names that:

- contain characters other than ASCII alphabet characters.
- begin with a number;
- begin with the following characters:  
\$ & \* ~ ! ( ) { } [ ] | ; ' " ` < > ? / \ , . =

You will receive an error message informing you which entities are incompatible and require a name change.

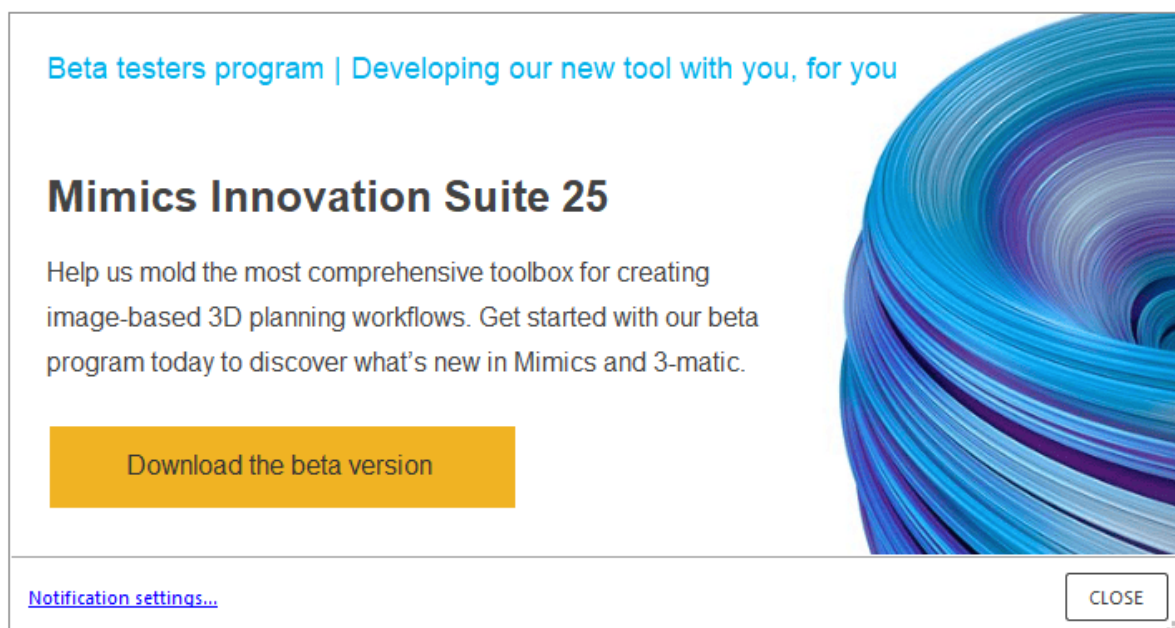
In addition, new info and warning messages related to the newly added functionality are shown in the Mimics log.

The corresponding Python API's for the (.inp) export type have also been updated to support the same functionality improvements.

## Notifications framework

Mimics now contains a framework that allows notification messages to be shown immediately after the launch of the software. In case any notifications are pending for you, they will be shown as a separate popup dialog on top of Mimics.

This framework shall be used to inform of new Mimics version releases, new plugin releases, new offers etc. See example of a notification message below:



The notifications dialog contains a link "Notification settings" that will navigate you to the Mimics preferences menu where you choose to enable or disable notifications entirely. The same can be done during the installation process, where you can decide not to install the modules related to the notification's framework.

## Additional Improvements

## 1. PACS UI Improvements

Several improvements to Mimics' PACS functionality have been made:

- The installer application for Mimics has changed from a .exe filetype to a .msi filetype. This new filetype provides the possibility for batch installation of Mimics via MS SCCM (Microsoft System Center Configuration Manager).
- Redesign of the **New from PACS** and **Add from PACS** dialog boxes. Selection of images is no longer limited to Series level of the DICOM hierarchy, but also possible on Patient or Study levels now.

Several new parameters are now visible in the dialog box: Accession number, number of images, new tooltips for some fields.

- PACS Retrieval at the study query depth level is now supported.

	Results	Patient/Study info	Sex	# Img	Modality	Id	Progress
✓	Reference Images	Date of Birth : n/a	M	CT		-	
✓	TestStudy	Study date : 02/12/1992		CT		999.19990517...550187000.25	
	Series: 2	Accession number : n/a					
✓	Cerebrum			1	CT	999.5.0.21158624961355	✓
✓	TestImages			3	CT	999.5.0.6103893242168	✓
673		Date of Birth : 01/01/1900	n/a	CT		12345	
>	n/a	Study date : 01/01/1900		CT		1.3.6.1.4.1.1...1447410326075	
	Series: 1	Accession number : 2064447410326075					

- More connection parameters can now be configured in the **Configure PACS** dialog: Timeouts for sending and retrieval of images, retry interval time between attempts of sending images.
- Added the possibility to cancel sending a file to PACS.
- The **PACS Uploader** application is now closed automatically if there are no unfinished tasks for sending files. The process is stopped, and the icon will disappear from the Windows System Tray.
- The **Configure PACS** dialog now contains a field "Returning server AE Title". This is an optional field that allows you to pass the AE title of a server in case outgoing requests to a PACS server are returned via another server.

**Configure PACS**

**Server Connection Settings**

	Name	Server AE Title	Port	IP Address	Returning Server AE Title (optional)
1	Add contr	Add server title	000	000.000.000.0X	Add returning server title

New Delete Test

**Client Connection Settings**

Q & R Local AE Title: Add client AE title

Store Local AE Title: Add client AE title

Retrieve Operation: C-move

Local C-move Port: 000

Max Query Depth: Series

Wildcard Convention: Smith John

**Timeouts, sec**

Query and test: 60

Retrieve: 3600

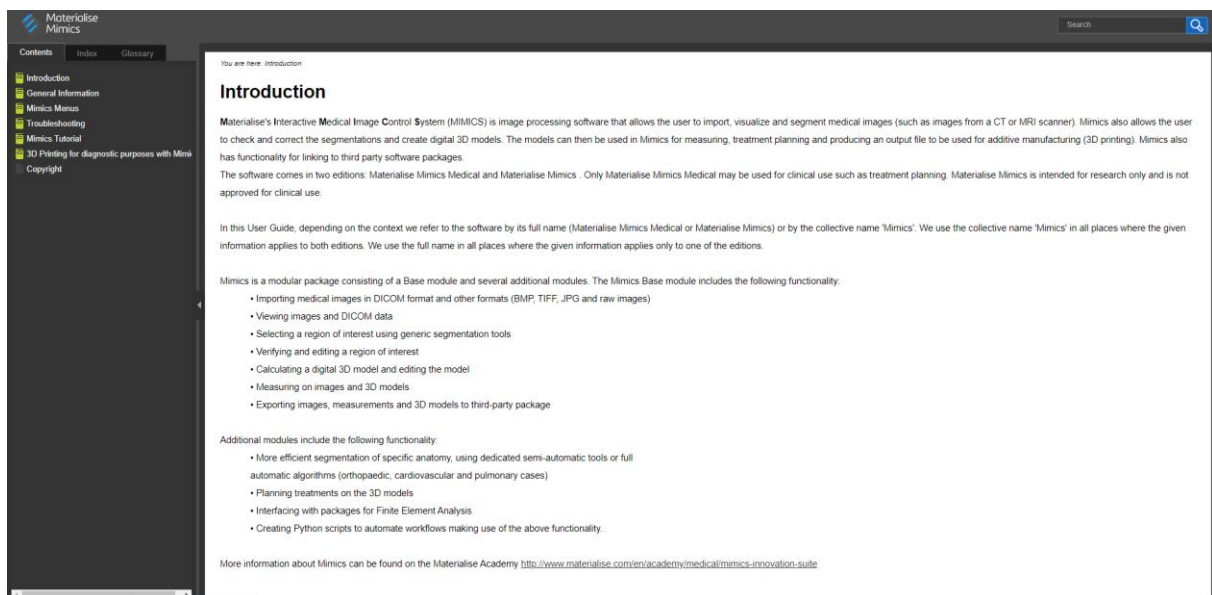
Send: 60

Retry interval: 30

OK CANCEL

## 2. New Interface for Mimics User Guide

The Mimics User Guide has been transferred to an HTML-based user guide. It now opens in your default browser and has improved search functionality, better readability, and a unified style for all articles.



## 3. Shortcuts for Calculate Part and Edit Contours

For the 'Calculate Part' and 'Edit Contours' tools, shortcuts were added that allow the user to launch the tools in question without any mouse clicks.

The shortcuts are the following:

- Launch the 'Calculate Part' tool: **ALT + C**
- Launch the 'Edit Contours' tool: **ALT + E**



#### 4. Better tooltips for Segment and 3D Tools

As a first step in a larger effort, the tooltips for the tools contained in the 'Segment' and '3D Tools' tabs were updated to achieve increased readability and consistency.

#### 5. Multiple Slice Edit undo-redo of markings after pressing Apply

Markings made with the Multiple Slice Edit tool can now be recovered after pressing the Apply button by pressing Undo. This allows you to return to the markings you made prior to pressing Apply and make changes without having to restart from scratch.

Please note that this new functionality only works if the Multiple Slice Edit dialog was not closed after pressing Apply. When the dialog is closed, the markings cannot be recovered via the Undo button.

#### 6. Fluoroscopy View - Simulation improvements

The Fluoroscopy Simulation view rotation angles have been improved. The simulation now considers the AP0 plane's position and orientation. It will always use the AP0 plane's center as the center of rotation around which the image stack is rotated when changing the LAO/RAO and CRAN/CAUD angles.

Resetting the view angles now returns the simulation view to the AP0 plane's configured position.

This improvement allows you to simulate the rotation of the C-arm around a specified point of interest, whereas before it was only possible to rotate around the center of the (CT) scan.

#### 7. Compare Mask and Segment Thin Bone plugins update

The two plugins that were released with Mimics 24.0 have been updated and are now compatible with Mimics 25.0. Additionally, an issue was fixed where created masks for Compare Masks plugin had incorrect names i.e., the names were flipped.

Note: Make sure to download the plugins again from the website and install on top of Mimics 25.0 to use them.

#### 8. Python API Extensions

The following Python API's have been added or extended to support the new functionality introduced in Mimics 25.0:

##### **mimics**

- `mimics.get_registry_path`

Allows getting the root path to the settings of the current instance of Mimics in the Windows Registry

- `mimics.Part`

Vertex Color support has been extended: The signature of the "`color_scheme`" property of this object was extended by adding the vertex color sensitivity to the color scheme.

##### **mimics.file**

- `mimics.file.export_mesh_to_abaqus_as_single_output`

Added support to allow the export of points to the Abaqus® file format (.inp).

## **mimics.logging**

- *mimics.logging.flush*

Allows flushing the log memory buffers to the files on the hard disk. This will ensure that all logging records will be available if you open a log file while a session is still open.

- *mimics.logging.get\_logs\_path*
- *mimics.logging.get\_system\_log\_file\_path*
- *mimics.logging.get\_user\_log\_file\_path*

These APIs allow you to get paths to the folder containing different types of log files.

## **mimics.segment**

- *mimics.segment.SegmentVesselParameters*
- *mimics.segment.SegmentVesselPreset*
- *mimics.segment.create\_segment\_vessel\_parameters*
- *mimics.segment.segment\_vessel*

APIs to automate workflows using the Segment Vessel tool. Please refer to the Scripting Guide for detailed information on using these APIs.

- *mimics.segment.activate\_calculate\_polylines\_from\_part*
- *mimics.segment.activate\_ct\_heart*
- *mimics.segment.activate\_local\_threshold*
- *mimics.segment.activate\_multiple\_slice\_edit*
- *mimics.segment.activate\_segment\_vessel*
- *mimics.segment.activate\_smart\_brush*

The API's above allow you to open the user interface dialog of a tool via scripts. The parameters and options found inside each dialog can be predefined via the API.

- *mimics.segment.calculate\_ct\_heart\_automatic*
- *mimics.segment.calculate\_ct\_heart\_left\_automatic*
- *mimics.segment.calculate\_ct\_heart\_right\_automatic*

These APIs are redesigned to use the new CT Heart algorithm that also allows right heart segmentation as well as myocardium segmentation (automatic mode only).

- *mimics.segment.local\_threshold*

Allows automation of workflows using the Local Threshold tool.



For changes to existing APIs as well as detailed information on each new API, please refer to the Scripting Guide via Help > Scripting Guide > API Change Log.

## 2 Known Issues

### **File**

- **Export 3D View to DICOM:**
  - o The OK button becomes active when Filename is empty.
  - o The Help (i) button does not work.
- **Export DICOM SSO:**
  - o The Help (i) button points to the wrong User Guide article.
- **Import Project:**
  - o Projects that contain measurements lose their measurements when they are imported into another project.
- **New Project (Import Wizard):**
  - o Checkbox state on preview thumbnail is synchronized on Images page
- **Metadata:**
  - o The Help (i) button does not work.
  - o Undo/Redo operations do not work on modification or deletion operations of rows.
- **PACS:**
  - o It is not possible to retrieve images using URL or Command line when DICOM tags contain Diacritics or Unicode.
- **Preferences:**
  - o The Preferences ribbon button stays highlighted after closing the window in some cases.
- **Save As:**
  - o Mimics crashes when trying to use Save As on a Mimics 11 format project if format type "Mimics Project Files" is selected.
  - o No warning message is shown if write permissions are missing for a protected folder.

### **View and PM Tabs**

- **Clipping (3D viewport):**
  - o The button highlighting is reversed.
- **Fluoroscopy View:**
  - o On some machines, the Rotation Handles on the 2D viewports for "Adjust Position" dialog of the AP0 Plane cannot be selected. If this happens for you, please use the x-, y- and z-coordinates and rotation angle boxes of the dialog instead.
- **Grouping of Objects:**
  - o Splines and Thin Structures present in a group in Mimics are moved out of the group when opening the Mimics project in 3-matic. The Splines and Thin Structures will appear on root level after opening in 3-matic and must be re-grouped.

- Duplicate may create too many new groups in certain scenarios with Groups containing Subgroups.
- **Phase sorting:**
  - Cine Loop does not update immediately when changing the sorting of image series in the Images PM Tab. To update the Cine Loop, toggle it off and back on.
  - Sorting is wrong if DICOM tag (0020, 9241) contains values smaller than 0.05.
- **Reslice along Plane:**
  - For some directions and positions on some datasets, movement may of the Interactive MPR may be inconsistent.
- **Transformations PM Tab:**
  - The Help (i) button does not work.

### **Image**

- **Reduce Scatter:**
  - Error messages overlap the Mask selection dropdowns.

### **Segment**

- **Smart Brush:**
  - Circle brush mode + Smooth toggled on while working on MPR views result in empty brush marks. Please disable Smooth in this scenario or use Sphere brush mode if Smooth cannot be disabled.
  - On CPR and Panoramic views, the segmented voxel regions may be smaller than the actual brush size.
  - Inconsistent thickness of brush strokes on certain MPR views when using Circle brush mode.
  - The brush preview looks as if it would 'erase' when hovering outside of the image data boundaries. This is a purely visual artifact.
  - The brush does not cover 100% of voxels when using Sensitivity 100% with Circle brush mode in Ray Cast on MPR views.
- **Split Mask:**
  - Progress is not indicated on the Progress Bar.

### **Advanced Segment**

- **Segment Vessel:**
  - The progress bar may get stuck on 99%. If this occurs, please press Cancel on the progress bar dialog. This may occasionally still give you an output mask. It is recommended to change the seed and orientation points as well as the threshold range when this issue appears.
  - Low performance when adjusting the Threshold window, especially on larger datasets.
  - The coordinates of the direction (second) point indicated via the UI dialog do not match those mentioned in the log. The direction used during calculation is identical to the one indicated though and should not affect the tool.
  - The tool is not compatible with old Mimics projects (Mimics 14.0 and earlier) that do not use the DICOM coordinate system and are not converted to that coordinate system.
- **CT Heart**

- Generating a part from masks (calculate part) using the 'Optimal' settings may yield suboptimal results due to the current threshold values set for masks of the Right Heart in the PM tab. For better results, use custom part generation parameters and select the 'Voxel' option under 'Threshold'.

### 3D Tools

- **Cut with Curve:**
  - Stop button does not interrupt Preview and Cut operations.
  - Cutting of a merged part (= two parts that have been combined into one part with the Merge tool) cuts the merged part as if it were the two original parts. This will create four objects instead of two.

### Measure

- **Area:**
  - The area label hint does not disappear when hovering the mouse over it.
- **Centerline:**
  - Centerline measurements are not updated in Measurements PM Tab after pressing Undo until you hover the mouse over the PM Tab.
  - It is not possible to grab centerline measurement control points while a part is visible and overlaying the control point.
- **Distance and Angle:**
  - Control points of distance or angle measurements are not selectable in the 3D viewport when they are placed on a Sphere or Point object created with Analysis tools.

### FEA

- **Export Mesh:**
  - Export Part/STL to Ansys Area Files (.inp for Ansys) and Ansys Element Files (.cdb) created via the Export Mesh dialog are incompatible with Ansys. Volume meshes exported to Ansys file formats are still compatible.
  - The following Output file types lead to empty imported objects in other CAD software:
    - Nastran Bulk (.bdf) for Volume meshes
    - Comsol Files (with/without scaling) (.mphtxt) for Volume meshes

### Scripting

- **Python API related issues:**
  - `mimics.file.export_view_by_type` does not work correctly in background mode

### WinServer

- **File locking:**
  - A project is not unlocked for the second user after both users close the project and the second user tries to re-open it again.

### 3 System Requirements

#### Minimum Requirements

Software	Hardware
Windows® 10 – 64bit version 1909	Third generation Intel® Core™ i7 or equivalent
Microsoft Edge® or equivalent	16 GB RAM
PDF viewer	DirectX® 11.0 compliant AMD Radeon/NVIDIA® GeForce® card with 2 GB RAM
.NET framework 4.6.1 (or higher)	20 GB free hard disk space
	Resolution of 1920x1080 or higher

Note: Mac® users can install MIS using Boot Camp® in combination with a supported Windows OS.

Note: Other qualifications may apply. When working with datasets larger than 1GB the system should comply with the minimum system requirements. Advanced segmentation tools such as Smart Expand, and Coronary segmentation require hardware as specified in the minimum requirements even for smaller datasets. When working with 4D or multi stack data, the amount of RAM needed increases as you import more image series into the project. To use Mimics Viewer service for auto segmentation or case sharing, minimum internet connection speed of 2Mbps is required. When using CT Heart automatic segmentation, CPU must be compatible with AVX2 (Advanced Vector Extensions).

Materialise Mimics is software and does not degrade in performance. Its lifetime is determined by commercial requirements, obsolescence of its techniques or obsolescence caused by changes in its host environment (refer to above requirements). Support can in any case not be guaranteed beyond 7 years after the release of this particular version of the software.