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Materialise Magics

28.0 – Release Notes
May 2024

Contents

This document lists the new functionality, changes and fixes of Magics 28, compared to the Magics 27 releases.

For the latest information and updates on Magics 28, please visit our help pages: https://help.materialise.com/en_US/magics-28.

1   What's new – General improvements

1.1   Dark theme

The new dark theme helps to reduce eye strain when working with Magics for a long time. It can be selected right after installation and it's possible to switch between light and dark theme at any time in **Settings** -> **Visualization** -> **Themes**.
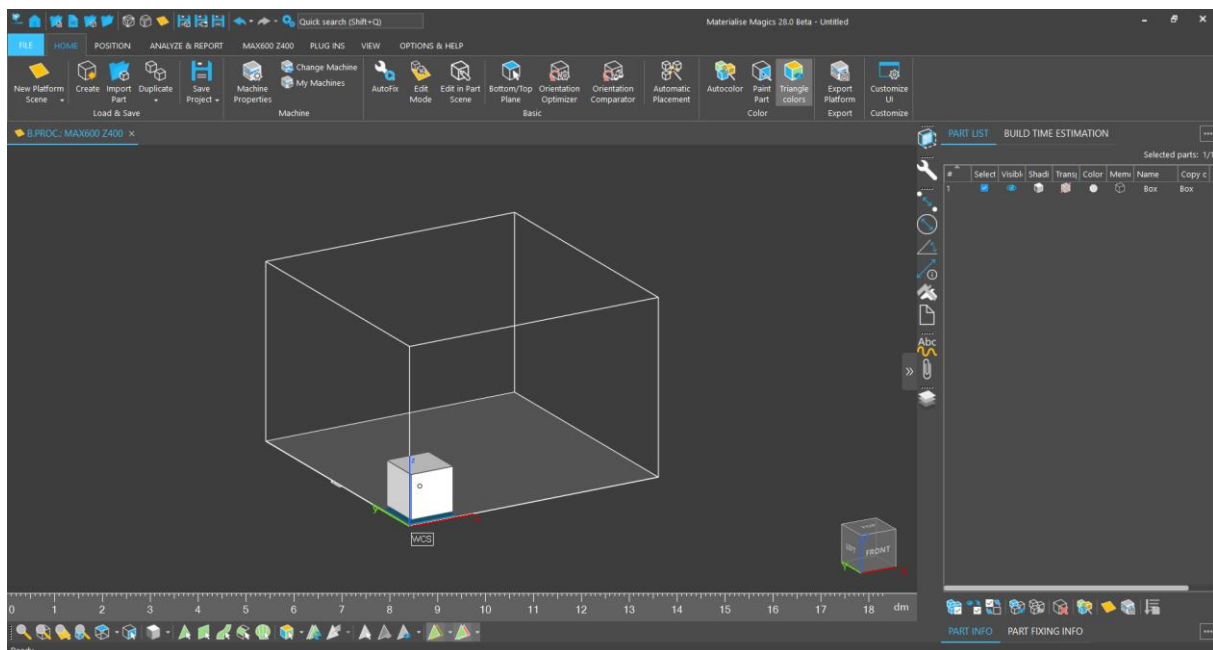
1.2 Improvements on loading project and importing & exporting parts

MatConvert import dialog

The dialog that is shown when importing through MatConvert has been updated to be in line with the Magics UI, as well as to be compatible with our new dark theme. Additionally, parameters are now divided into logical groups to improve the usability of this dialog.
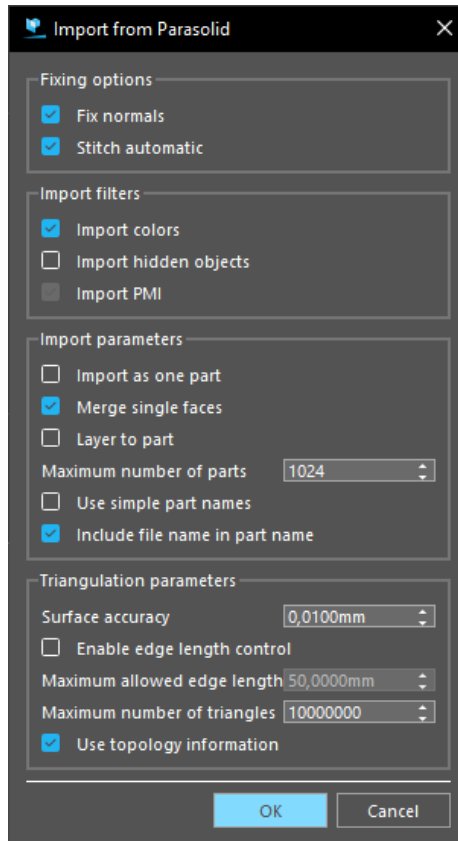
Optional optimization of BREP parts on import

From Magics 28 onwards, optimization of BREP parts on import becomes optional and it can be turned off if the part was already designed in optimal way. It significantly speeds up the importing process for parts with a high level of complexity.
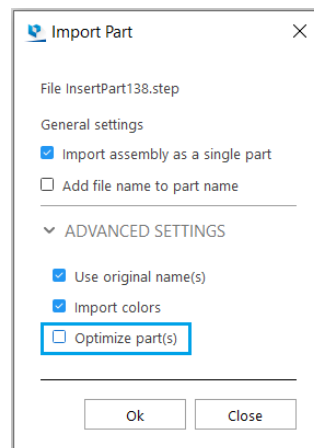
Import and export of MGX files

When importing MGX files in Magics, the pop-up dialog allows to make a custom part selection or use **Never ask again** option to always import all parts available in the file. For files encrypted with a password, an updated dialog will be shown.
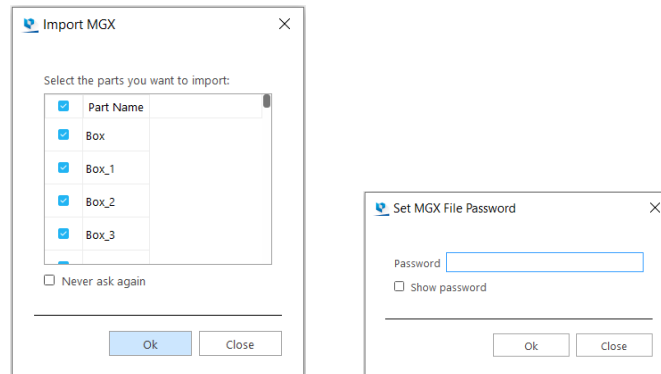
When exporting parts to MGX format, the new dialog gives the user an option to add a password, set file name as part name, or make a self-extracting file.
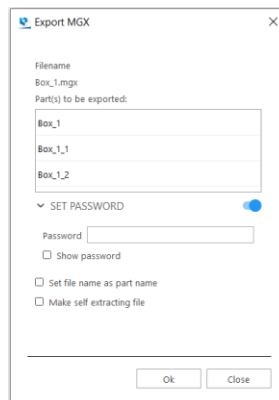
Move part into workspace dialog

When loading a mesh part that is placed in a position far away from the World coordinate system (WCS) such that the part points position exceeds the acceptable position range, the **Move part into workspace** dialog is shown to let the user specify where to reposition the part to.
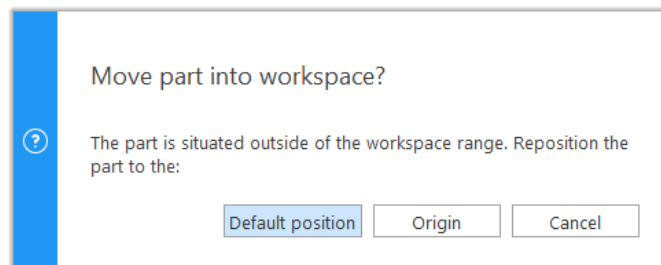
- **Default position** – will move the minimum point of the part bounding box to the default position of the current active scene.

- **Origin** – will move the center point of the part bounding box to the origin of the current active scene.

- **Cancel** – will cancel the import and not load the part at all.

Rescale large part dialog

When loading an oversized mesh part that exceeds the range of part size supported by Magics, an updated dialog will be shown with additional feedback to the user to make it easier to set an appropriate rescale factor.
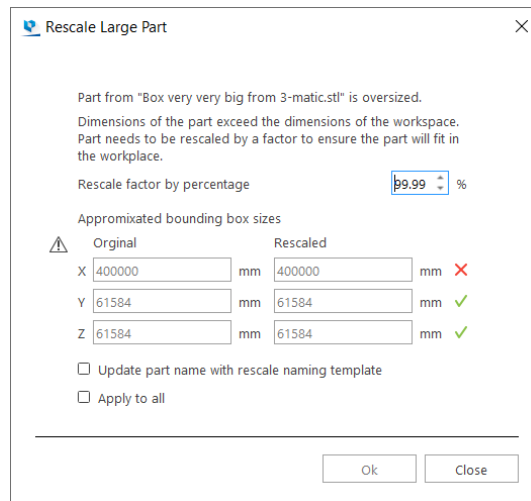
With the new dialog, when the user set the desired rescale factor then the rescaled bounding box values are instantaneously recalculated, and the check or cross label is shown to indicate if the rescale bounding box size is within the acceptable size.

Handling of forbidden characters in file names upon import

When files with forbidden characters are loaded, the forbidden characters will be replaced by an underscore to avoid issues later in the workflow.

Loading a Magics project

Once the latest Magics application is set as the default app for ".magics" files, user can now double click on the file in the file explorer or click **Open** in Windows' context menu to load the file as a project into a new instance of Magics. The project title will show the file name when the project is successfully loaded.

User can also now drag and drop file to the application executable or shortcut to executable to load the Magics file as a project in a new instance of Magics.

1.3 Improvements to shortcuts

Import shortcuts separately from UI layouts

It is now possible to import shortcuts separately from the UI layout. Shortcuts from the input file (UI settings) and the target Magics will be merged smartly: new shortcuts from the target Magics will be preserved if they don't conflict with shortcuts in the input file.

- This can be done right after installing Magics 28 when choosing to import settings
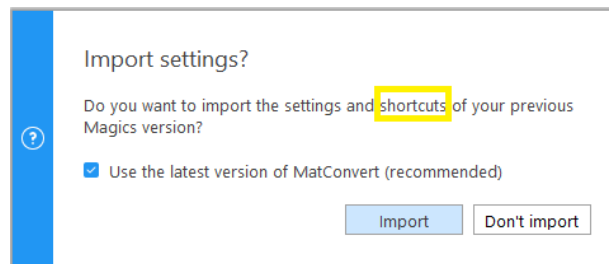
- Shortcuts can later on also be imported separately within the **Customize UI** dialog.

Additional default shortcuts

To speed up your workflow, the following frequently used operations now have default shortcuts:

Operation	Shortcut	Layout
Edit Mode	E	Platform preparation
Exit Edit Mode	E	Edit Mode
3D Nester	Ctrl+3	Platform preparation
Generate Support	S	Platform preparation
Generate Support of Selected	Shift+S	Platform preparation
Manual Support	Alt+S	Platform preparation

1.4 Other general improvements

- **Boolean undercut** is now added as a method to the **Boolean** dialog. Besides all the parameters available in the previous versions, now it is also possible to define custom name for resulted part or choose the option to unload original part directly from the dialog.

- A button for collapsing the toolpages area was added, to enable easy access to a bigger scene view. Additionally, the default width of the toolpages area has been set to the same value in all scenes (except SG mode), to reduce flickering when switching between scenes.
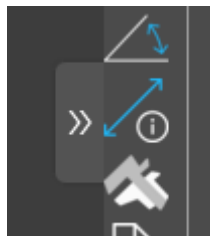
- The rendering of multiple UI elements (rulers, ViewCube, ribbon…) has been optimized, resulting in an overall smoother rendering.

- When unzooming the scene view, there is a fixed limit to 1km. Further unzooming is no longer possible.

- New UI look for the **Orientation Optimizer** operation.

- **Selection & Snapping** settings have been moved to the **Mouse Input** in **Settings**.

- The options to remove selected files from the recent file list on the Home screen or clear the whole list in one go have been added to the right mouse button (RMB) menu.

- Starting from Magics 28, all **Lattice** (former Structures) functions are available in **Edit mode** allowing users to add lattices to parts considering platform orientation aspect. Additionally, **Formfit**, **Shrinkwrap** and **Rename part** tools are enabled in the **Edit mode** as well.

- The **Annotations** toolpage was enabled for BREP Part scenes

- The **Attachments** toolpage was enabled for BREP and Mesh Part scenes

2 What's new – Lattice functionality

2.1 Lattice (former Structures)

Magics 28 comes with a revamp of the **Structures** functionality, called **Lattice** from this version onwards. The revamp contains general improvements with regards to usability, such as renaming of tools and parameters to better comply with commonly used terms. An overview of the renamed tools is shown below.

Tool/Parameter name changes

Old name (version 27)	New name (version 28)
Mesh Lattice	
Structures ribbon	Lattice ribbon
Honeycomb Structures	Honeycomb Lattice
[Honeycomb Structures dialog] Delete Marked Triangles checkbox	[Honeycomb Lattice dialog] Make Shell Part with marked face(s) removed checkbox
Structures	Volume Mesh Lattice
DSM Somos TetraShell	Tetrahedron Lattice
Slice Based Lattice	
Slice Based Structures	Slice Based Volume Lattice
Slice Based DSM Somos TetraShell	Slice Based Tetrahedron Lattice

With a revamp of the **Structures** functionality Magics 28 also introduces new lattice technology called **beam lattice**. Beam lattice is a type of lattice represented by parametric beams (lines) which are light objects and don't require any mesh representation. Mesh parts with parametric beam lattices can be used through the entire data and build preparation workflow and printed with slice based Materialise Build Processors.

Note: in older versions of Magics, beam lattice could already be visualized but users haven't had any control over creation or modification of beam lattice until version 28. Besides that, build preparation tools available in Magics didn't take lattices into account properly which is now improved.

2.2 Beam lattice

Volume Beam Lattice

A new tool called **Volume Beam Lattice** is introduced in Magics 28 allowing to create beam lattice by populating a predefined unit cell inside solid or hollow regions of the part. The unit cells are available from the library that can be found under *Program Data/ Materialise/Magics/BeamLatticeStructures* folder. Any custom unit cell can be added there by saving it in .matpart file format directly from Magics. The tool is enhanced by real time preview of the chosen unit cell considering its dimensions as well as thickness (in case it's assigned upfront).
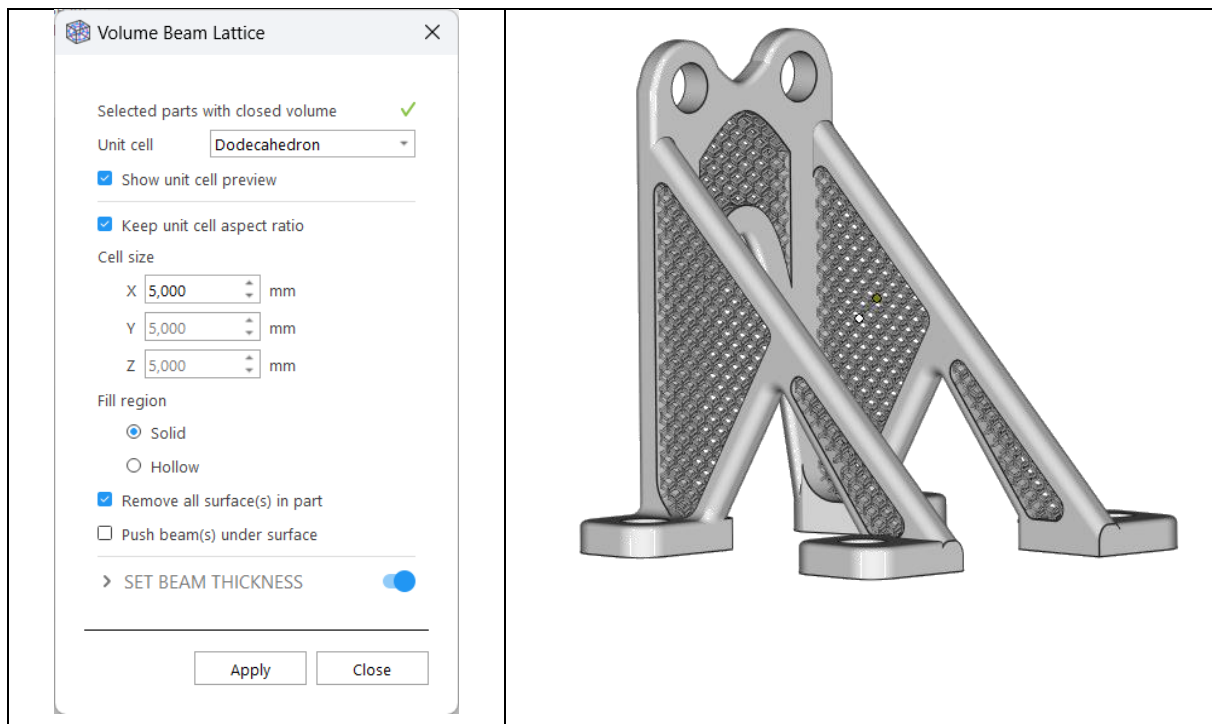

Filter Loose Beams

Magics 28 comes with the new tool **Filter Loose Beams** allowing users to detect, inspect and remove unprintable beam lattices. Beams can be considered loose if they have no connections to other beams or mesh on at least one node, or their angle is non-self-supporting relative to XY plane.

Loose beams

Edit Beam Lattice Properties

To control beam lattice thickness and/or accuracy the new tool **Edit Beam Lattice Properties** can be utilized. With this tool users can reset already assigned thickness and accuracy of beam lattices or assign values for zero-thickness beams. These values will be utilized by Materialise Build Processors during slicing.
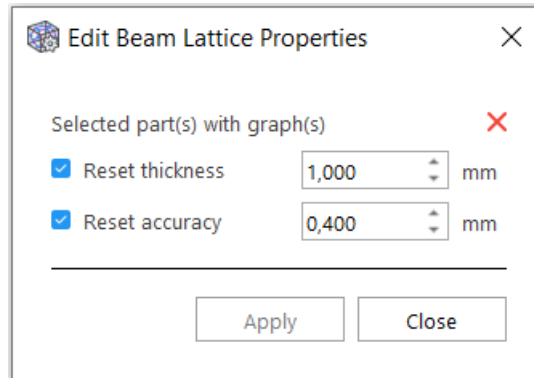
Beam Lattice toolpage

The **Beam Lattice** toolpage gives users an overview of lattice properties such as number of beams, min and max thickness and accuracy. Based on this information, user can decide if current parameters are satisfying. Otherwise, they can be further adjusted with **Edit Beam Lattice Properties** tool.

Part/Lattice name	# Beams	Min. Thickness (mm)	Max. Thickness (mm)	Accuracy (mm)
˅ Box_1				
NoName	864	1	1	0,4

Convert Beam Lattice to Mesh

Magics 28 comes with the new tool allowing users to convert beam latices into mesh. It can be handy for the users who don't have access to slice-based operations. If thickness and/or accuracy parameters were already set for the lattice, they can be used for conversion right away. Also, the option to reduce the number of generated triangles is embedded into the operation dialog.
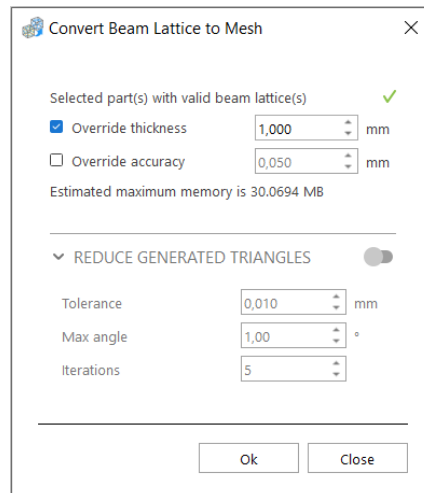
Cutting of parts with beam lattice

From Magics 28 onwards, mesh parts with beam lattices can also be cut with the **polyline** and **section cut** methods.

Note: if a part contains only beam lattice without mesh, it is not supposed to be cut with the mentioned tools.
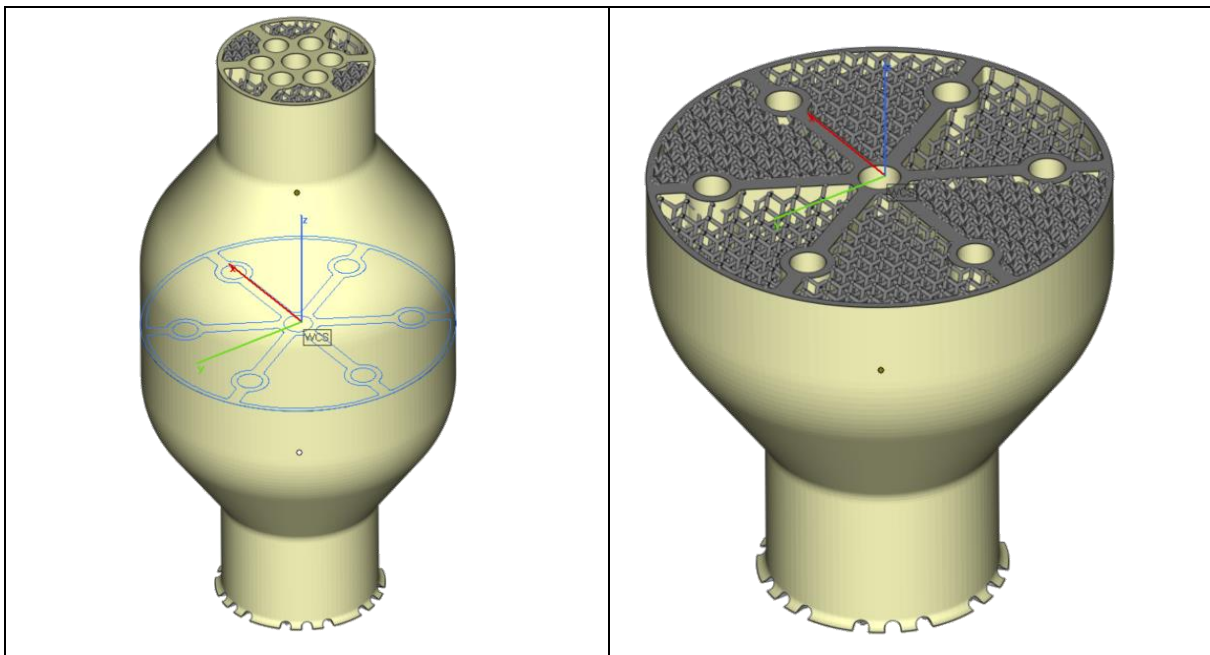
Boolean for parts with beam lattice

Boolean of parts with beam lattices allows to preserve the lattices respecting the regions in the final part. It allows to do late design modification upon original lattice generation.

Picking for beam lattices

Picking and snapping possibilities are implemented for beam lattices in Magics 28 allowing to:

- Select parts with beam lattice interactively by clicking from the 3D space.

- Create point and line measurements.

- Enable interactive **Translate**, **Rotate** or **Rescale** operations by picking a point or a line on a lattice beam.
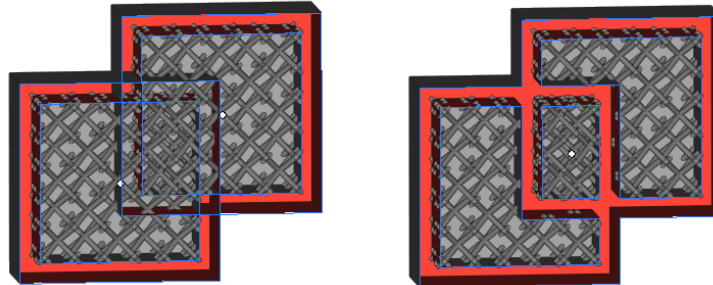
Marking for beam lattices

It is possible to mark beams from a beam lattice structure and delete the marked beams.
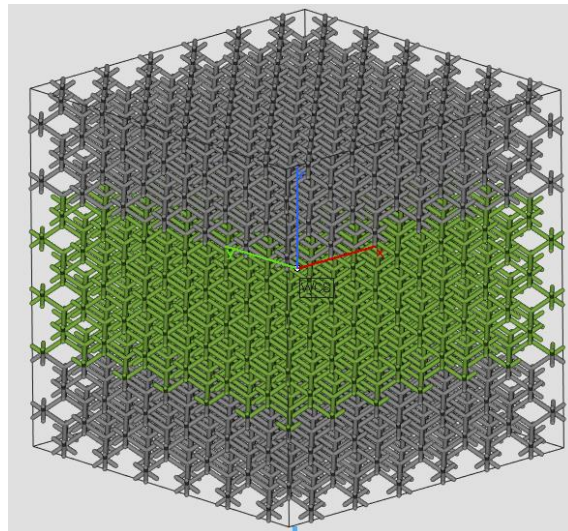
Mark Beam command can be found from the **Marking** toolbar as usual along with the mouse modes that can be used to mark the beams. This command is active only when there are selected part(s) with beam lattices.

Delete Marked command can also be used to delete marked beams on selected part(s) quickly, which is found in the bottom toolbar.

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Beam lattice rendering improvements

- Performance of beam lattice rendering is significantly improved allowing to render a large number of parts more efficiently.

- Fast preview mode was introduced for beam lattices improving the response of rendering for large platforms and complex lattice designs.

- Updating colors of parts containing beam lattices with thickness works much faster in Magics 28.

Build preparation and analysis for parts with beam lattices

Beam lattices are supported out of the box for many build preparation operations. Additionally, the following operations have been enabled:

- **Collision detection**

- **Sinterbox**

- **Fit to platform**

- **Orientation optimizer**

- **Orientation comparator**

- Lattice volume estimation is accounted for in **Volume estimation**, **Nesting density**, **Part info**

- Preview of beam lattices in **Reports**, **Orientation comparator**, and **Import part** with orientation preview.

3 What's new – Part preparation

3.1 Preserving and using CAD based faces

All CAD files that are imported into mesh or BREP part scenes or into Platform scene will now preserve the underlying face structures as available in the original CAD file. To visualize these face borders, a new face-based wireframe shading option has been added. On top of that, these faces can now be marked with the new **Mark face** function.

Face based Wireframe shading option

A new shading option is added to the part and global shading options, to enable the wireframes on the part to draw based on the underlying face structure (if any) instead of the triangle angle that are defined as wireframe angle.
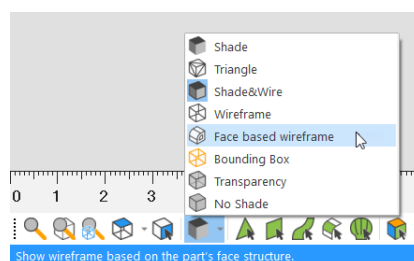
This option is by default set to Off, and user shall enable it manually on mesh parts that are loaded from a CAD file or BREP part to visualize the faces. If no face structure is available in the mesh part, then no wireframes will be shown on the part at all.

Triangle angle-based Wireframe	Face-based wireframe
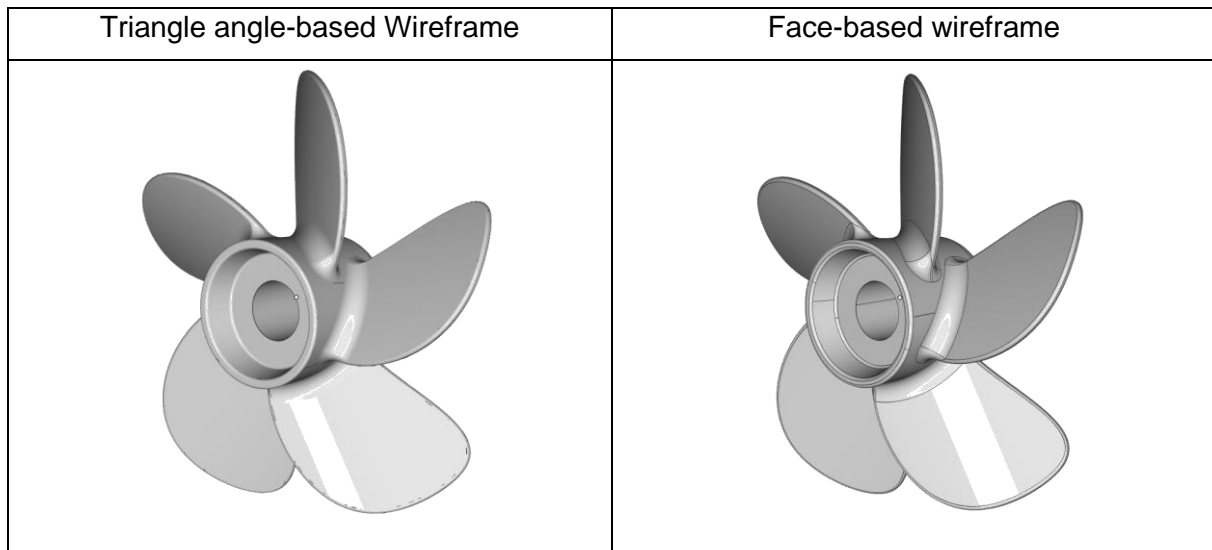
Mark Face

A new marking command is now available to enable users to easily mark faces. This is an extremely easy way to select geometrical features (also known as faces) coming from either the underlying BREP structure (faces are preserved from the original design in a CAD package) or from design changes done in Magics. The face marking also works on BREP parts that have been imported as a mesh part, but also on mesh parts that were imported as a BREP and converted later in Magics.
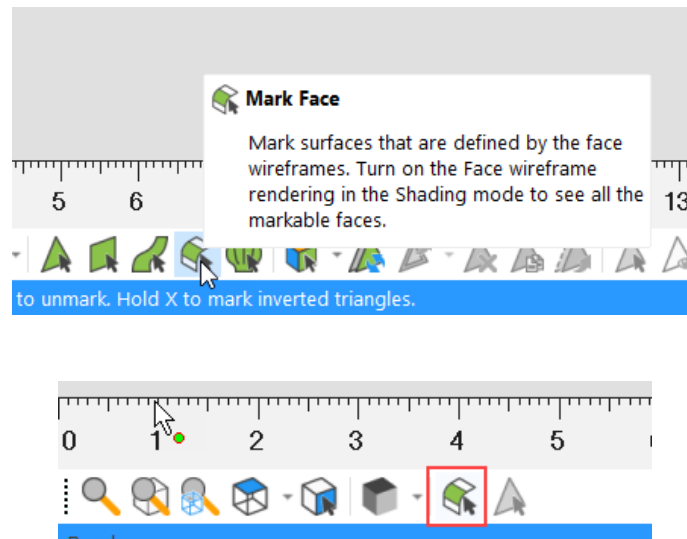
This tool can be used to easily mark fillets that are generated in CAD packages inside Magics to be able to define the fillets as **No-support zone** easily.

Marked Fillet Faces	Fillet faces set as No Support Zones
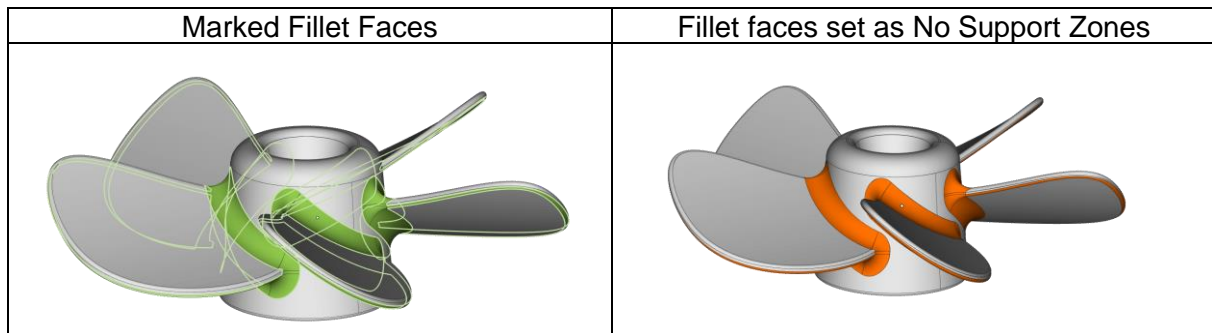
Note: when BREP part with marked faces is converted to mesh, the face marking will be preserved as triangles marking on the generated mesh part.

3.2 Wall Thickness Analysis changes

Improvements

The **Wall Thickness Analysis** has been revamped. Wall Thickness Analysis can be run with selected parameters by clicking the **Analyze** button.

Wall Thickness Analysis dialog now stays open after the initial analysis. Change part selection or parameters to enable the option to rerun the analysis without reopening the dialog.

Some settings were moved to the Advanced setting section. **Refine triangles** setting moved to the related settings of **Iterations** and **Maximum edge size**.

Wall Thickness Analysis dialog became semi-modal, only select operations are available at the same time as **Wall Thickness Analysis**.

No triangle changes are applied by default anymore. To improve the mesh for the analysis, use **Refine triangles** option that applies default **Triangle reduction** and **Filter sharp triangles** before the remesh.

To apply **Triangle reduction** and **Filter sharp triangles** without further remesh, set **Iterations** parameter to **0**.

For BREP parts, Wall thickness analysis is performed on the underlying mesh. **Refine triangles** option can be applied to the underlying mesh to improve Wall thickness analysis results.

Coloring

For the **Coloring** option, the color scale is now displayed in the main dialog after the initial analysis.
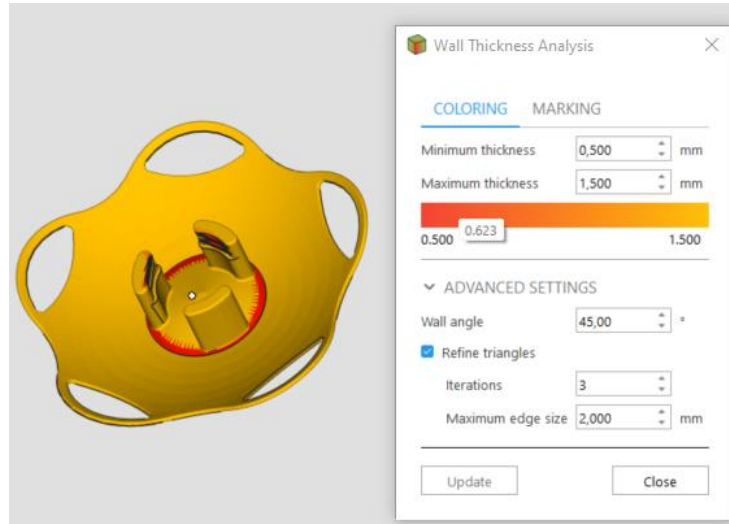
Marking

For the **Marking option**, the following changes were made:

- The list of **Bad areas** is displayed in the main dialog after the initial analysis.

- **Bad areas** for each part are displayed in a tree that can collapse.

- On click on the right mouse button a context menu is available with options for manipulating the bad areas list.

- Double click on any bad area in the list to zoom in on the area. A second double click will flip the point of view of the bad are 180 degrees.
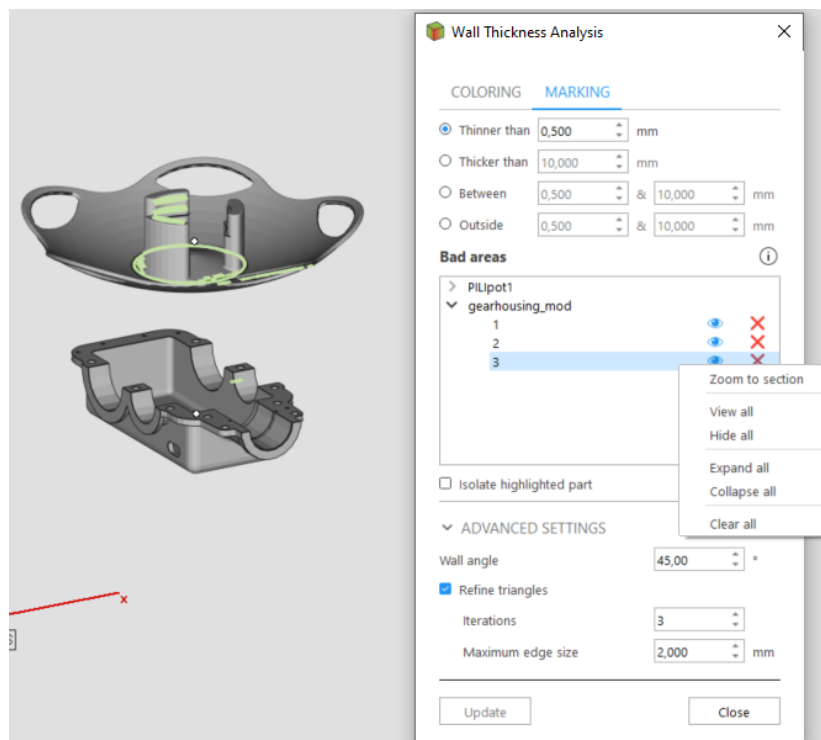
3.3 Labeling improvements

Performance improvements of label planning

All operations that rely on the generation of label planning are now more performant than it was in Magics 27.0.

The observable improvements on large mesh parts (>10 million triangles) are:

- Reduced execution time of up to 90%

- Reduced peak memory usage of up to 45%

- More responsive rendering after label planning generation

The improved operations are:

1. Adding and Resizing Magics text label planning

2. Magics Data Matrix Label Preview

3. Adding and resizing Streamics text label planning

4. Adding Streamics data matrix label planning

Note: This performance improvement does not apply to applying the label as a geometry change directly onto the mesh part.

(Performance) improvements of label creation

In Magics 28 text label operations across different workflows were standardized to ensure consistent result for the following labeling operations:

- Text label planning and applying labels as mesh

- Drawing label results

- Projection label preview and results

- Mass label preview and results

- Streamics text label

This change comes with the following improvements to projection labeling functionality:

- Performance speed up by 30% for projection label generation

- Improved label preview is closer to the actual result

- Extended range of supported characters

- Improved projection label coloring

Performance improvements of Label Tags

Magics 28 comes with improved responsiveness of label tags creation and overall speed up of 57% when adding label tags on an average model compared to previous versions.

Label preservation when marking and delete triangles

From Magics 28 onwards, label planning is always preserved on a mesh part after marking and deleting triangles which don't affect the label directly. In case label related triangles were removed, a possibility to revert the change easily is provided to the users as well.
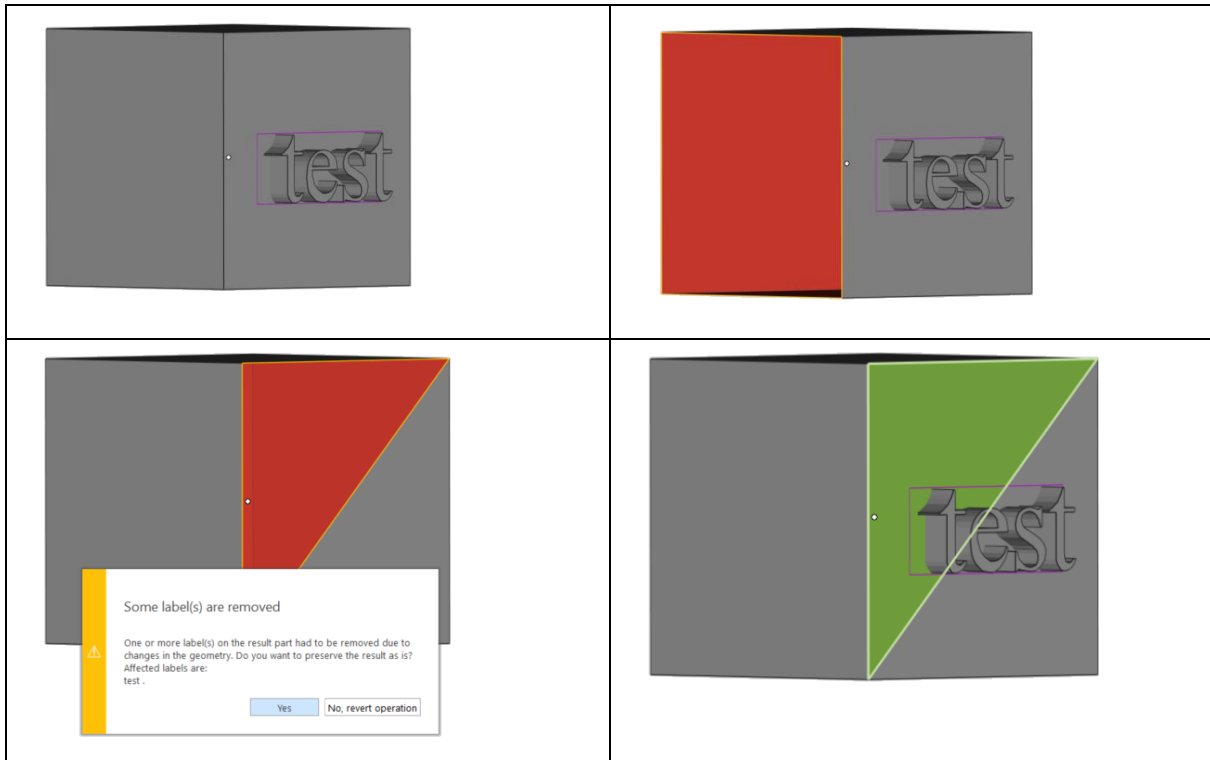
Label preservation when copying marked triangles

When marked triangles on a mesh part with label planning are copied to a new part, the label planning is preserved on the new part as well as on the original one.

When marked triangles on a mesh part without label planning are copied to a new part, the label planning is preserved on the original part.

Label preservation when separating marked triangles

When marked triangles on a mesh part with label planning are separated to a new part, the label planning is preserved on the new part accordingly.

3.4 Polyline cut and Section cut improvements

In Magics 28 cutting functionality is significantly improved from UI/UX perspective as well as enhanced with new powerful features such as preview of pins & holes and possibility to define cutting depth.

For user convenience, **Cut or Punch** tool was split in two separate operations – **Polyline cut** containing polygon and circle cut types and **Section cut** containing basic section cut functionality, **Lap Joint** and cut with **Pins & Holes**.
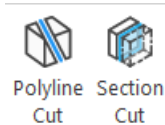
UI/UX improvements

- Explanatory tooltips for fast learning.

- Convenient parameter grouping.

- Self-explanatory parameter names.

- Less clicks to switch cutting types.

- Different mouse modes for operating polylines faster.

- Indicating multiple teeth segments and applying changes in one go.

- Snapping to points on the part by holding **CTRL** key for precise polyline creation.

- Constraining polylines vertically, diagonally, or horizontally by holding **SHIFT** key for better control over the polyline direction.

- Deleting polyline points with **Delete** key.

- Applying cut with RMB click

Functional improvements

- Cut till Z option is replaced with possibility to set cutting depth for **Polyline cut**. This parameter is no longer dependent on Top view only and can be applied for any view type.
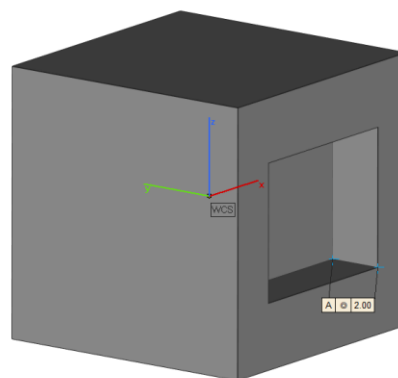
Cutting depth = 2mm

- **Pins & Holes** preview is added for early result validation.

Pins & holes preview
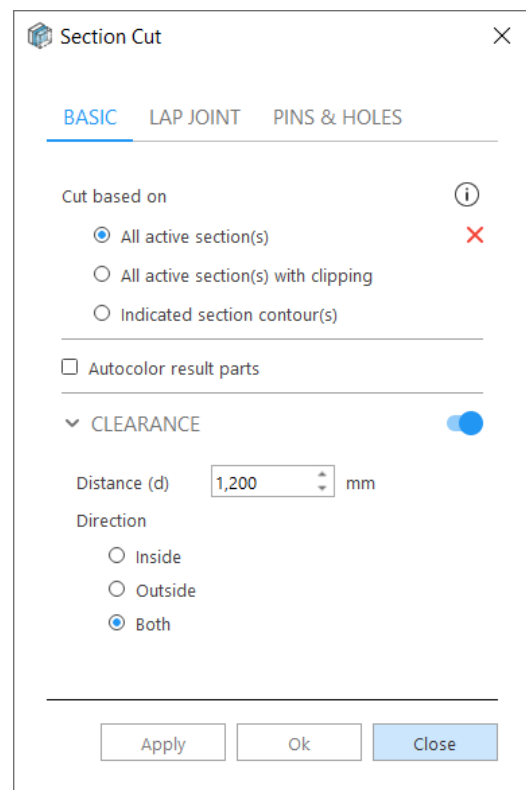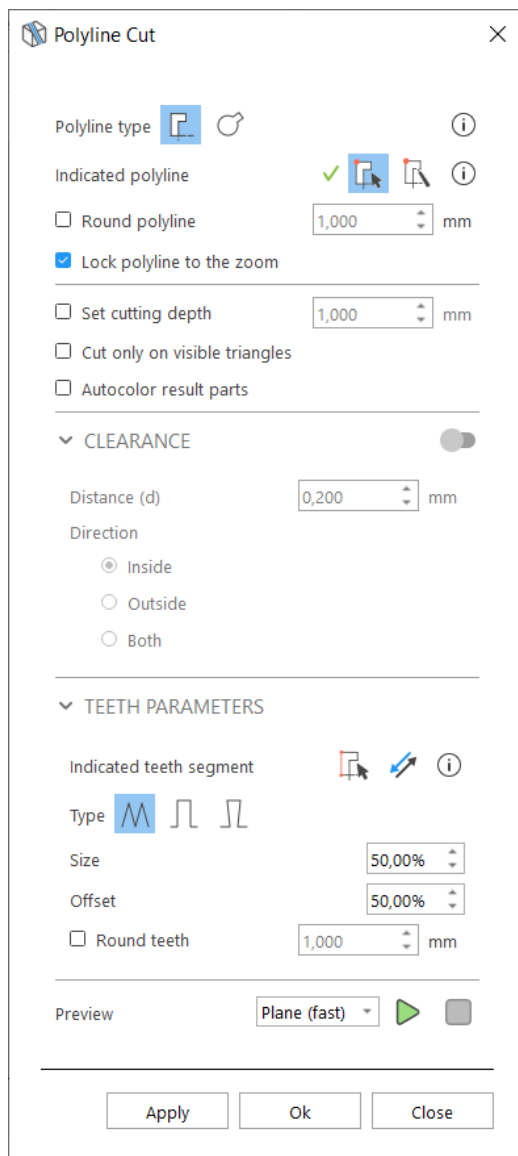
Polyline cut vs Section cut
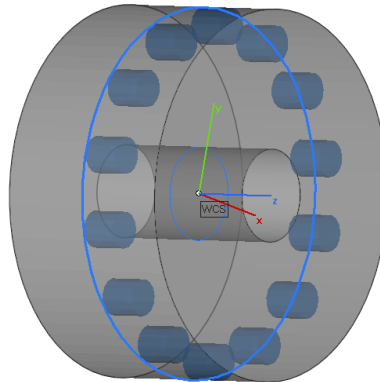
3.5 3D Texture parameters and preview

With Magics 28.0 onwards, 3D texture parameters is a new option on **Textures** dialog that allows users to set the offsets for the white and black values of your texture that shall be converted to a 3D geometry upon slicing by the Materialise Build Processors or the Magics Slice Module.
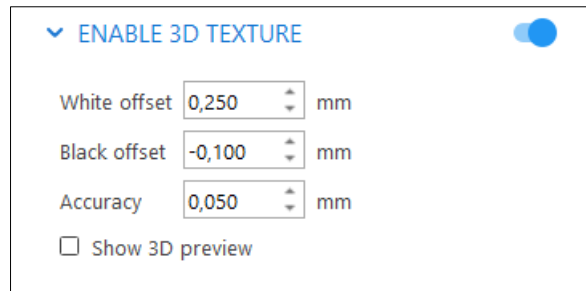
When the white and black offsets are set to a non-zero value, the **Show 3D preview** checkbox can be set to true, to show a temporary preview of the expected geometry offsets of the selected texture.
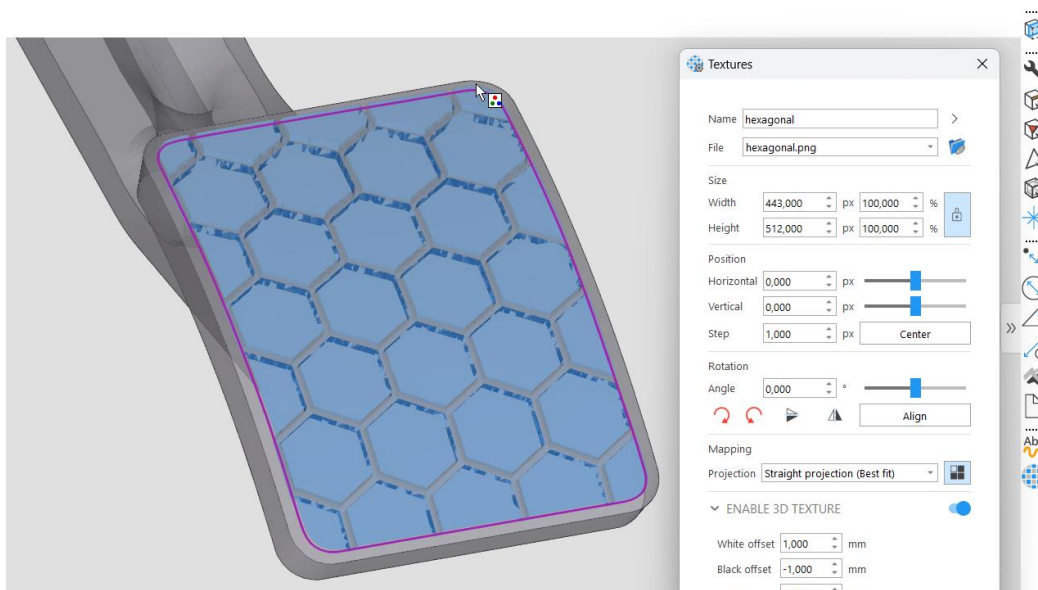
Upon exiting the **Textures** window, the preview will stop. However, you can rest assured that your 3D texture properties are remembered.

3.6 Improvements to fixing functionality

Hole Fixing Toolpage
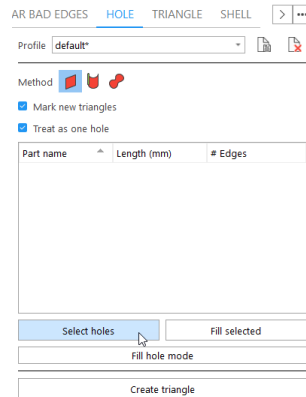
Select Holes mouse mode can now be activated and deactivated from the **Hole** toolpage so that users can quickly select holes from the viewport. This is useful when the Hole list is large for certain parts, and users want the flexibility to specify only some holes to be fixed with specific method and parameters.

Multi-contour single hole	Multiple selected holes from the viewport	Fill selected of all holes with 'Treat as one hole' set to On

Besides that, it is now possible to fix multi-contour holes with more than 2 contours quickly by first selecting them from the viewport and then applying the fill selected command from the same toolpage.

Remove Small Parts
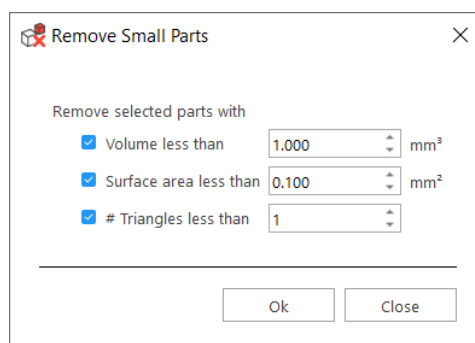
The primary changes with the new operation dialog are:

1. **Remove small parts with** operation works on selected parts only!

2. Multiple filtering conditions can be set at once to reduce the number of clicks when removing small parts.

3. Small bugfixes related to mismatched naming in the **Undo Redo** and part **History** stacks.

3.7 Improvements to editing BREP part(s)

Re-hollow of BREP part(s)

Magics 28 comes with enhanced BREP functionality allowing to re-hollow already hollowed parts easily without manual shells removal. In this case all the shells of the BREP part(s) except the outer shell will be removed automatically and the new ones will be created based on the new wall thickness parameter defined.

Shell for BREP part(s)

Magics 28 provides the ability to create shells for BREP parts easily. It's implemented as an additional method inside **Hollow** dialog.

You can use it by marking the face(s) you wish to open up during the hollow before applying the operation.
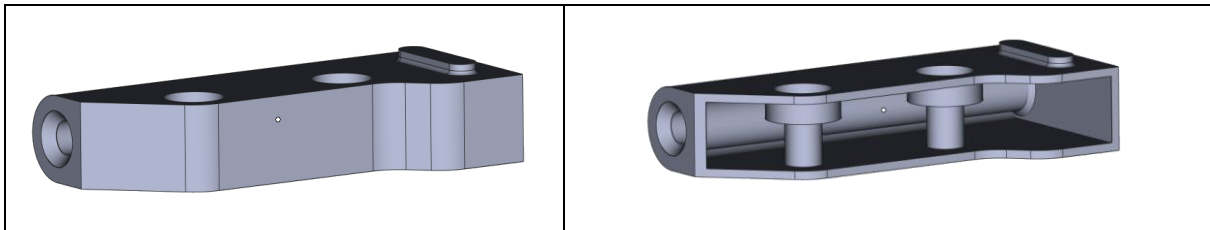
Adapt Holes

Magics 28 comes with the new BREP design tool allowing users to detect and modify holes quickly. All the holes of the specified radius range will be detected and marked accordingly following the option to be resized to a new target radius or to be removed completely.
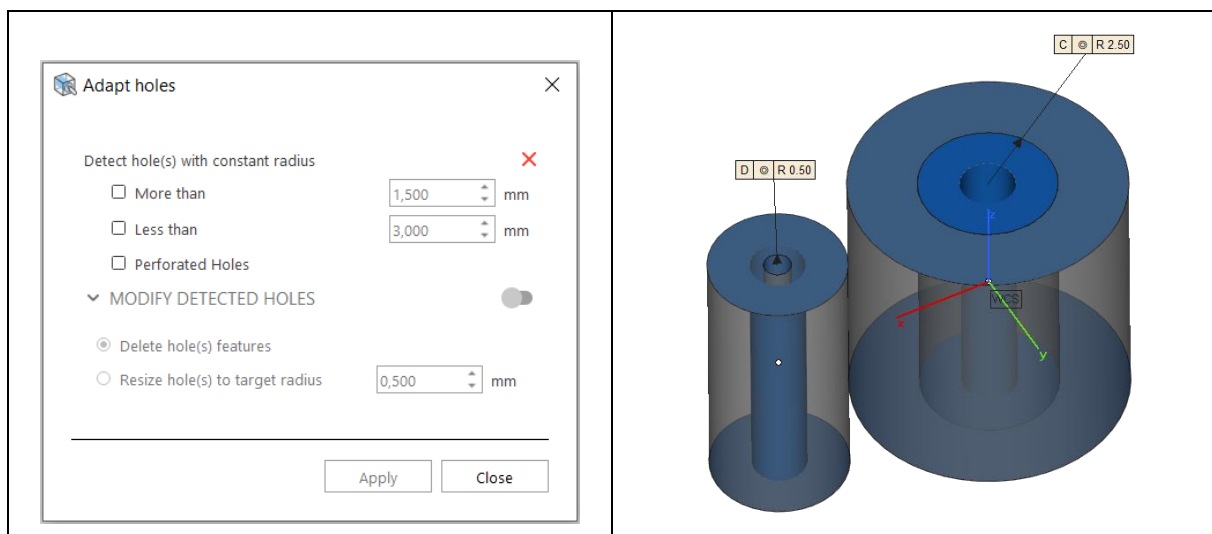
3.8 Honeycomb Lattice Profiles

The option to manage **Honeycomb lattice** parameters with a custom user profile has been added now. With this, users can create more than 1 set of honeycomb parameter profiles to reduce the human error of switching the parameters from workflow to workflow. Instead, profiles that are manually created and validated can be reused quickly.

The profiles are created and managed independently between the **Global** and **Local** methods.
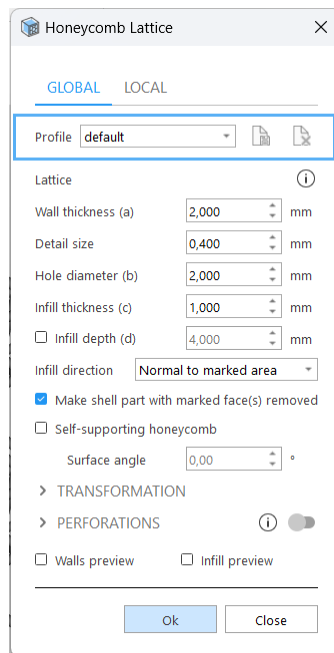
4   What's new – Build Preparation

4.1   Automatic Placement improvements

Automatic placement with field overlaps

If a platform has field overlaps enabled in **Machine Properties**, then it is possible to use **Place according to field overlaps** parameter from the **Automatic placement** dialog. Additionally, it is possible to enable strict avoiding of the overlaps for all parts that are being placed.
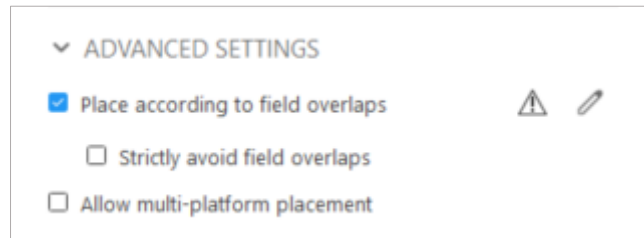
When enabled, automatic placement algorithm will take scan fields into account and try to place each part into a single scan field and avoid field overlaps if possible. If a part doesn't fit into one scan field, then it will overlap into the minimal number of scan fields possible.
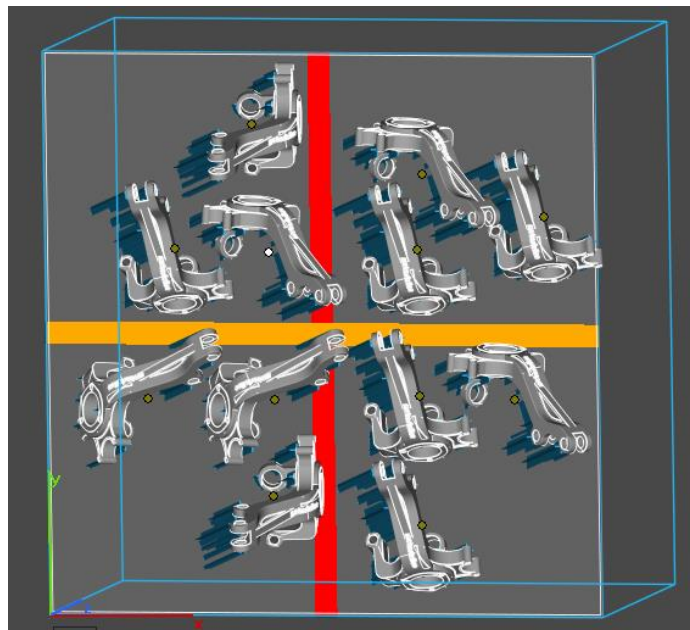
4.2 Slice-based processing of lattices, textures and labels

Slice-based technology allows to directly slice a lattice, texture, or label without the need of converting it into a (large) mesh representation. This way, a massive amount of time is saved by not processing large mesh data. From now on, this slice-based technology is not only available through selected Materialise Build Processors, but also through the Magics Slice Module.

4.3 Other build preparation improvements

Preview Slicer and Preview Concept Laser Slicer

Slicer preview was updated to align with the rest of the Magics UI.

Preview for the **Concept Laser Slicer** was moved to a separate dialog available under the **Concept Laser** section in the **Slicing** ribbon.

Staggered placement when duplicating parts

The **Duplicate** operation now can achieve staggered placement configuration besides the linear array placement configuration. New input parameter, **New row offset** is introduced for copies on the XY plane that can be set to offset the copies in its final position.
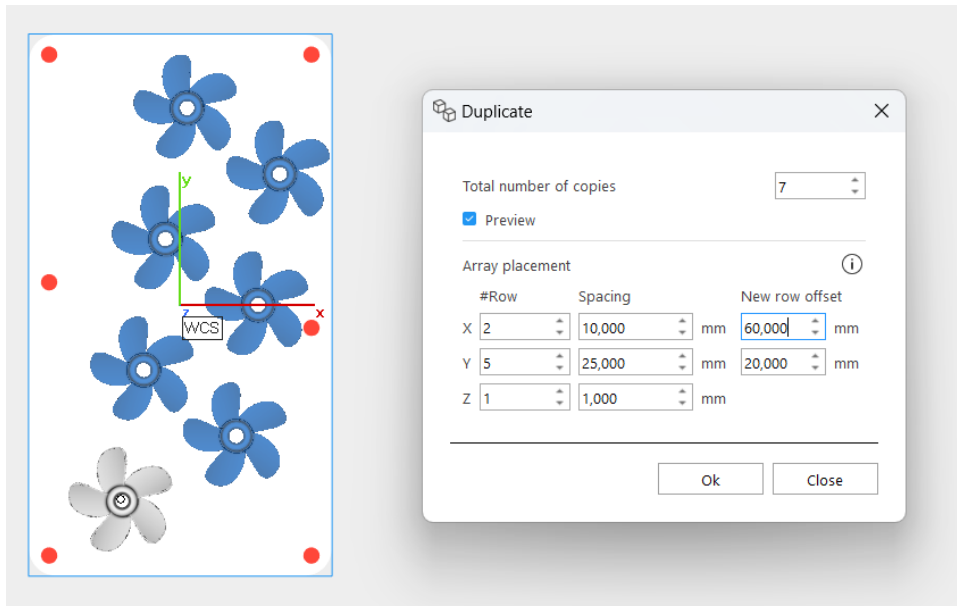
5 What's new - Nester

5.1 3D Nester UI/UX improvements

Nester parameters are now grouped in two sections: main parameters and **Advanced settings. Advanced settings** are collapsed by default.
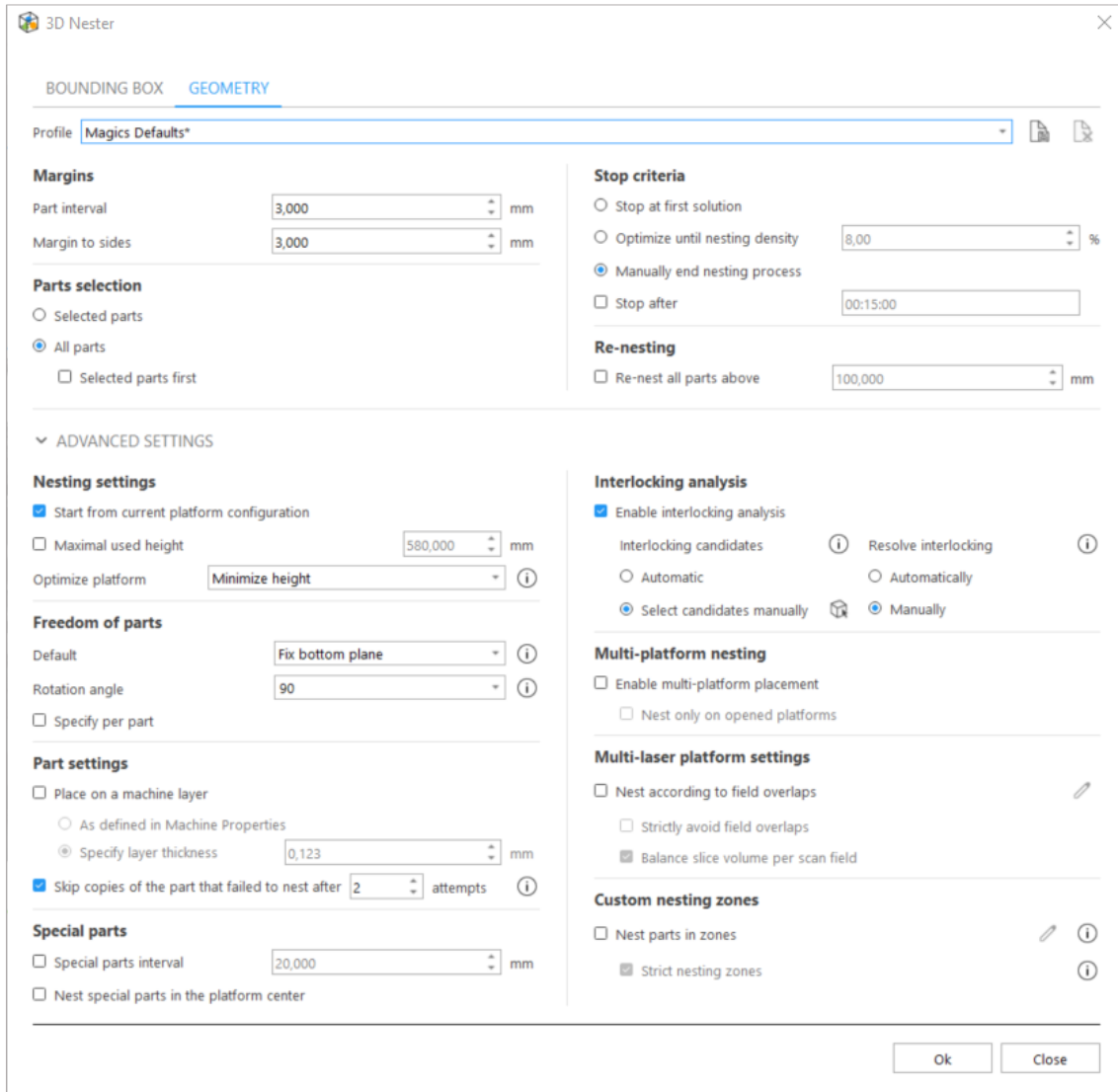
5.2 Nesting with field overlaps

It is now possible to activate and visualize the field overlaps on the platform without deleting the configured overlaps from **Machine Properties**.
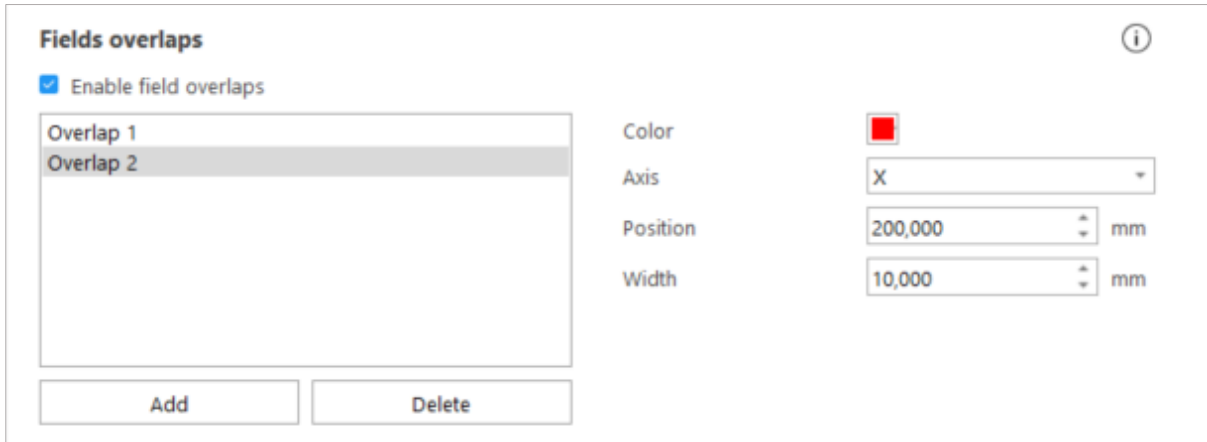
When the field overlaps are enabled, use **Multi-laser platform settings** in the **3D Nester** dialog.

- **Geometry**:
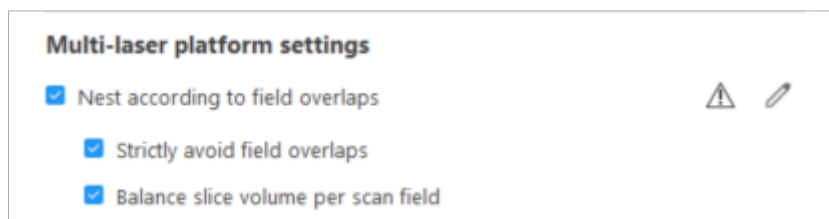
- **Bounding box**:
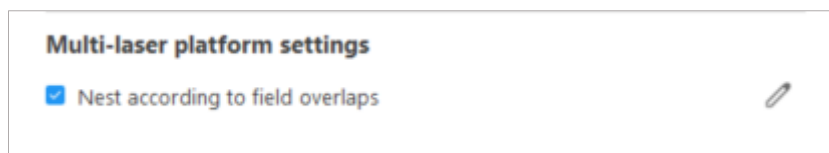
- **Nest according to field overlaps**: set whether the nester should account for the scan fields during nesting.

- **Strictly avoid overlaps:** enable to have all parts strictly avoid any field overlaps.

  - It is possible to have only some parts strictly avoid field overlaps in the **Settings per part** dialog that will appear after you click **OK** in the **3D Nester** dialog.

- **Balance slice volume per scan field**: **3D Nester** will try to make the slice volume as even as possible in each scan field in each layer. This setting might make nesting slower, but the laser efficiency during printing can improve.

Depending on the part size, orientation, and nesting settings, the parts will interact with the field overlaps as follows:

- If a part can fit, then place the part in a scan field without crossing into the overlap.

- If a part can't fit into a single scan field, then place the part into a minimal possible number of scan fields crossing a minimal possible number of field overlaps.

- **3D Nester** will try to distribute parts between the scan fields evenly so that the build height is similar in all fields.
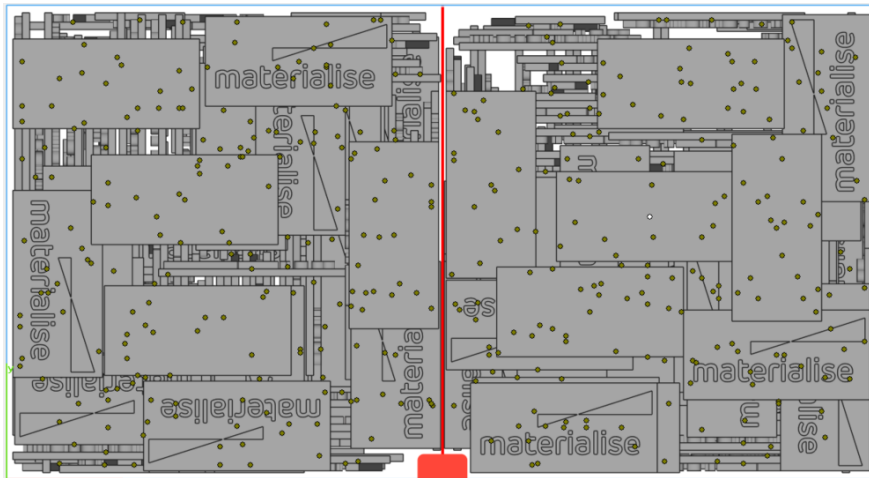
5.3 Custom nesting zones

Custom nesting zones

It is now possible to create custom nesting zones in the **Machine Properties** on the **Parts placement** page that can be used for nesting specific parts.

To enable nesting in custom zones, select **Nest parts in zones** property in **3D Nester** under **Custom nesting zones**. If a part can't fit into its assigned zone, then it will be placed in another available spot in the platform volume.

Additionally, if you select **Strict nesting zones**, then all parts assigned to zones should be placed only into the zone that they are assigned to. If a part can't fit into the assigned zone, then it will not be placed outside the platform.
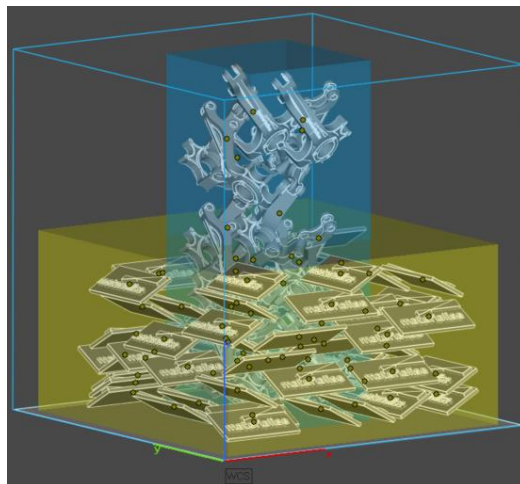
Parts can be assigned to the specific zones in the **Settings per part** dialog that will appear after the **3D Nester** is started. For each part two new columns will appear: **Zone** and **Strict nesting zone**.

Settings per part

There are settings that, if enabled, will prompt the **Settings per part** dialog to appear after clicking **OK** in the **3D Nester** dialog:

Column	Description	What setting triggers the column to be shown
Freedom of part	Freedom of parts options are available to assign to each part individually. For example, it is possible to make specific parts fixed in their existing position. The freedom of part can be modified by double clicking on it and selecting the value from the drop down.	Freedom of parts -> Specify per part
Angle	Set custom angle for each part with **Fix bottom plane** or **Fix Z direction** freedom of part value.	Freedom of parts -> Specify per part
Special part	Select the checkbox to indicate that the part is a special part. Special part interval and / or nesting in the platform center will apply depending on the **Special parts settings** from the **3D Nester** dialog.	Special parts -> Special parts interval; Special parts -> Nest special parts in the platform center
Strictly avoid field overlaps	Assign parts that should strictly avoid overlaps	Multi-laser platform settings -> Nest according to field overlaps
Zone	Double click to assign the part to one of the zones. Dash (**-**) value means no zone was assigned, and the part can be nested in any zone or space that isn't assigned as a zone.	Custom nesting zones -> Nest parts in zones
Strict nesting zone	Check this option so that the part can be placed in the assigned zone only.	Custom nesting zones -> Nest parts in zones

Settings per part can be applied per run of **3D Nester** or per Magics session now. Use checkbox **Save parameters per part for the current Magics session** to save per part settings in the session.

5.4 Skip copies of parts

Virtual copies (duplicates) of the same part are considered individually by the **3D Nester**. Sometimes the algorithm may find a placement option for one copy but not the others, but it will still be trying to place each copy which takes time. To speed up the nesting process it is possible to skip to the next unique part or finish nesting if the nester fails to find a placement option for *n* copies of the same part.

Enable by selecting **Skip copies of parts that failed to nest** and specify the number of attempts the nester can have before dismissing all the remaining copies.

The bigger the number of attempts, the higher is the chance that the nester will find a placement option again, even if it has already failed to place a copy of the same part. After a new placement option is found, the failed attempts counter is reset to zero.
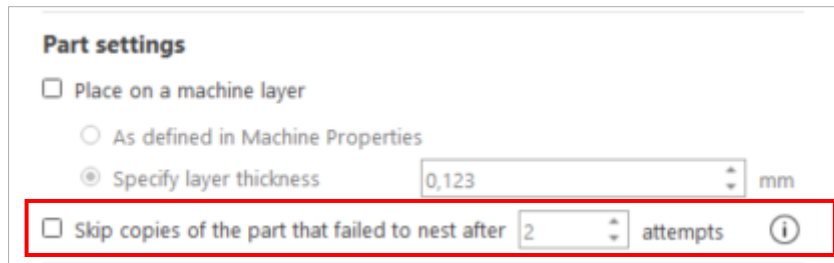
5.5 Interlocking analysis

Interlocking analysis options updated

It is possible to disable **Interlocking analysis** from the **3D Nester** dialog for use in select workflows, in particular for big parts with large open cavities in combination with small parts that can occupy the cavity space and be easily removed after printing. If interlocking is disabled, then no check is performed and nesting is sped up. It is recommended to use Interlocking analysis separately after nesting to ensure that only false-positive cases of interlocking exist.

If interlocking is enabled, use parameters to set up interlocking:

- **Interlocking candidates**:
    - **Automatic**: all parts are checked for interlocking
    - **Select candidates manually**: use a mouse picker to select individual parts for the check.

- Select the method of resolving interlocking:
    - **Automatically**: if interlocking is detected, then Magics will automatically renest interlocked parts. In the case of multiplatform nesting, this option allows to continue nesting all platforms without user interaction needed.
    - **Manually**: if interlocking is detected, then nesting is paused, and the user must make a choice to resolve interlocking or to keep the nesting results as is.
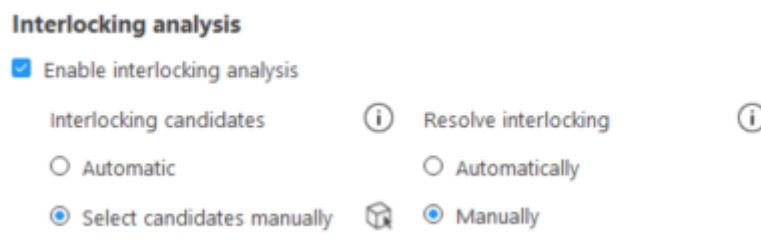
Multi-select parts for interlocking analysis

When you want to select candidates manually for interlocking analysis, instead of selecting one part at a time, it is possible to hold left mouse button and drag to select an area. All parts in the area will be selected. To unselect multiple parts, hold Shift and left mouse button and drag over an area.

Stop criteria
- ○ Stop at first solution
- ○ Optimize until nesting density   8,00   ▲▼ %
- ● Manually end nesting process
- ☐ Stop after   00:15:00

Re-nesting
- ☐ Re-nest all parts above   100,000   ▲▼ mm

Interlocking analysis
- ☑ Enable interlocking analysis

Interlocking candidates	ⓘ	Resolve interlocking	ⓘ
○ Automatic		○ Automatically	
● Select candidates manually 🔲		● Manually	

Multi-platform nesting
- ☐ Enable multi-platform placement
  - ☐ Nest only on opened platforms

Multi-laser platform settings
- ☑ Nest according to field overlaps   ⚠ ✎
  - ☑ Strictly avoid field overlaps
  - ☐ Balance slice volume per scan field

Custom nesting zones
- ☑ Nest parts in zones   ⚠ ✎ ⓘ
  - ☑ Strict nesting zones   ⓘ

5.6 Organic Sinterbox

There is a new option under **Sinterbox**: **Organic**. It creates a tight bag-like shape that closely wraps around the part.

Set the desired margin to the parts, and perforation size (hole size and beam thickness) and use the optional preview.
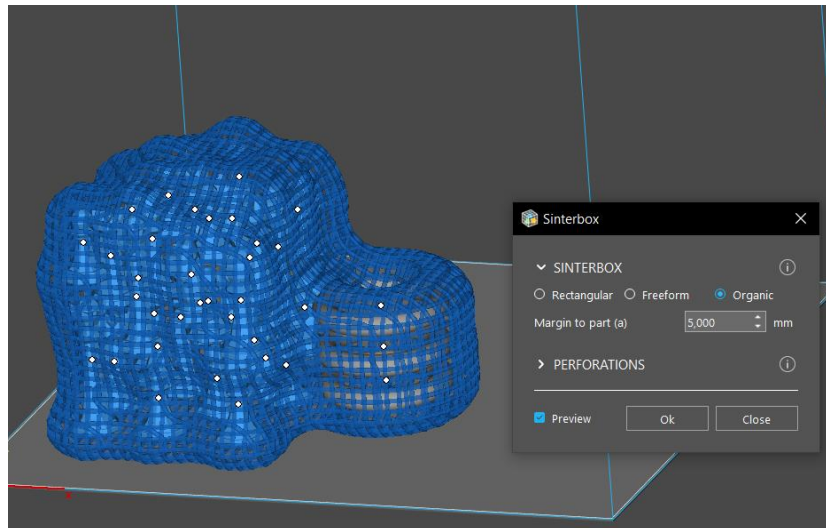
For faster rendering, any sinterbox is generated in **Shade** instead of **Shade&Wire** mode. Adjust the shade mode of the sinterboxes from the Part list or the toolbar as needed.

Use **Avoid holes and dents** for parts with large openings. When applied, sinterbox will not go through large holes and into large dents, but wrap them at the level of the high points of the surrounding geometry.

It is possible to add a label on an organic sinterbox. The label is placed on the XZ plane flush with the sinterbox. Depending on the resulting geometry of the sinterbox, it is possible to automatically create support beams that will connect the label and the sinterbox in a more secure way.

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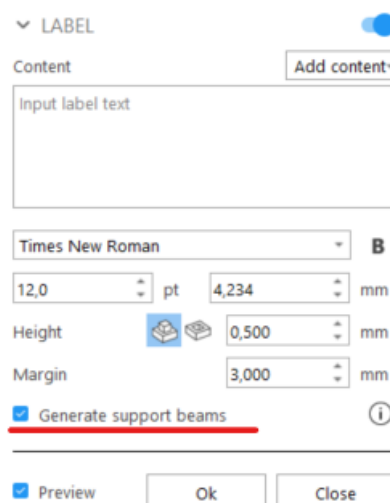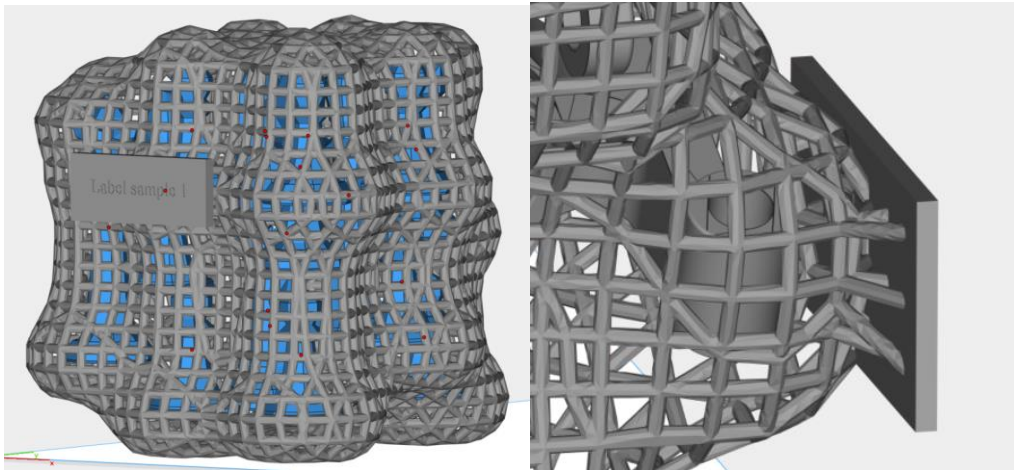
5.7 Other nester improvements

Rotation angles in Freedom of parts

Type in any angle for **Fix Z direction** or **Fix bottom plane** option.

In certain scenarios, picking the correct rotation angle will allow to nest more parts.
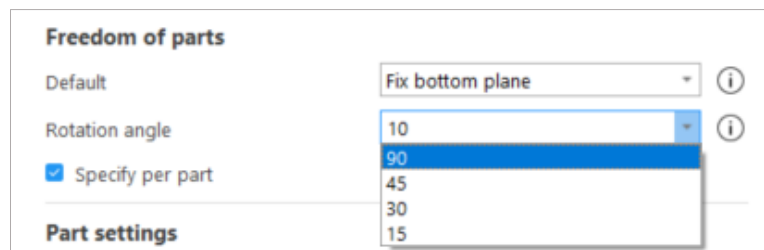
Optimize platform options are updated

The options to optimize platform are all listed in the dropdown and have a clear explanation. Functionally, the optimization options have not changed.

New UI for **Optimize platform** parameter includes the following options:

- **Minimize height**: nest parts to achieve the minimal possible build height.

- **Distribute in height**: distribute parts uniformly over the entire height of the platform.

- **Optimize slice volume**: distribute parts uniformly over the entire height of the platform and make slice volume as similar as possible across all slices.

- **Optimize slice volume and minimize height**: try to minimize the height of the build while keeping the slice volume as similar as possible across all slices.

Multiplatform nesting progress dialog

When multiplatform nesting is enabled, and the **3D Nester** is running, then the buttons in the progress dialog now work as follows:

- **Skip to next platform**: stop nesting the current platform and move to the next platform

- **Keep status**: stop nesting and keep all nested parts as they were placed by the nester

- **Cancel**: stop nesting and revert nested parts to the state before the nesting operation was started.
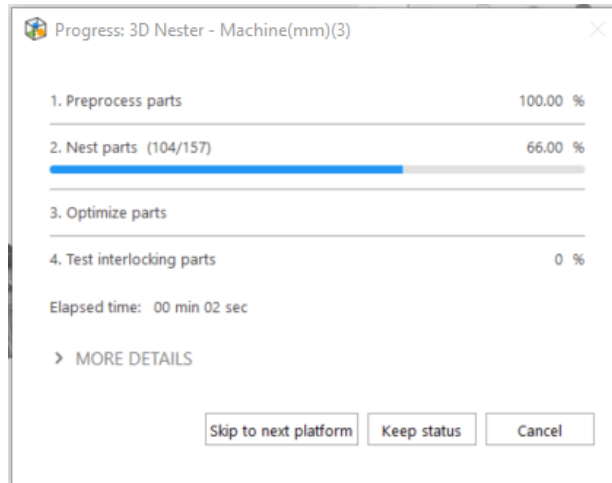
Subnester

- The option to place parts on a machine layer is added in the **Subnester**, similar to the same option in the **3D Nester**. In the **Subnester**, parts are placed on the machine layer only relative to other parts in the group. To preserve the placement on the machine layer till the end of the build creation, sinterbox parameter values and nesting parameter values need to be aligned with the layer thickness.

- The UI of the **Subnester** was updated to align with the rest of Magics.

6 What's New – Support Generation

6.1 Thickness for non-solid support

Improved thickness generation

While applying thickness to non-solid supports, sometimes it was creating undesired artifacts, open contours or intersecting triangles, especially for teeth and applied perforation on the corners of the support structure. This was creating issues while slicing the supports. With the new algorithm, teeth and perforations on the corners are smoothly transitioned.
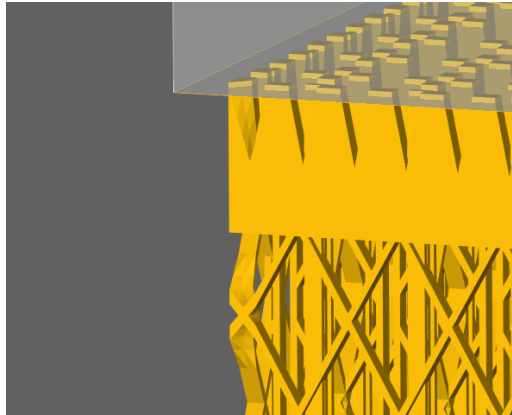
Improved connection of the thickened support to the part.

Previously, on inclined or curved surfaces, the internal wall of a thickened support would penetrate the part more than the value of the **Z offset** and the external wall would be detached from the part. This was fixed in Magics 28.

Separate thickness for lowest line.

Lowest line may be generated on a non-solid support surface. Previously, users needed to perform multiple manual operation to thicken only the lowest line (to prevent printing failures on separate islands), in Magics 28 it was simplified to one additional parameter in the **Support thickness** page of the **General** parameters.

6.2 Preserving supports

Preserving supports while editing

In previous versions any design changes on a supported part would force the user to remove generated support. Removed supports sometimes means hours of lost manual work. In Magics 28 it is possible to edit areas that are not connected to a support surface with **Chamfer**, **Fillet** or **Label** and preserve all supports.

While applying the **Fillet**, **Chamfer** or **Label** a confirmation message will be prompted giving the user three options:

- **Cancel** dismisses the confirmation message.

- **Remove supports** removes the supports and applies the editing operation.

- **Continue** preserves supports and applies the editing operation.
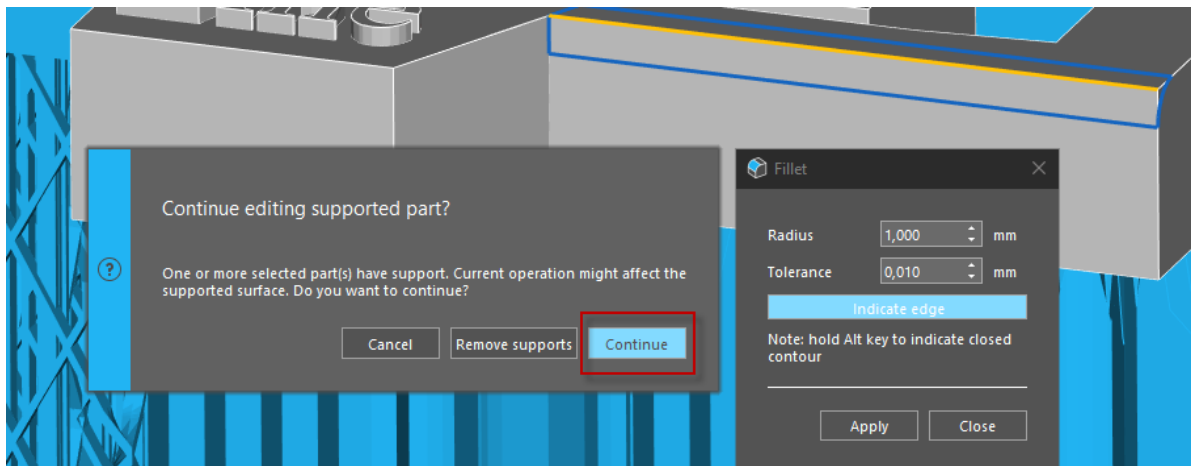
Preserving manual line position after regeneration

Manual **Line** is used to reinforce geometrical features of the part that were not sufficiently covered by **e-Stage** or automatic support generation. In the previous versions, when adjusting parameters and using **Regenerate 2D & 3D** – position of the manual **Line** would be changed, or the support would be completely removed. In Magics 28, it is possible to regenerate the **Line** with new parameters or change the support generation profile and keep the initial position of the manual **Line**, thus improving the productivity of the build preparation engineer.

6.3 Other support generation improvements

Re-trim support on platform

Re-trim support on platform command replaces the automatic **Trim on other parts** checkbox from **Machine properties**. Initiating the command will re-trim supports with other parts or with the platform. During the placement of the supported parts on the platform it can happen that supports of one part intersect another part, or part with support that rests on another part needs to be moved. In both cases supports need to be re-trimmed with a part or with the platform.

Move nodes of a manually added Line

After a manual **Line** is added, **Move nodes** command will be available for that surface. It is possible to move previously placed connection points and regenerate the **Line** with the new position.
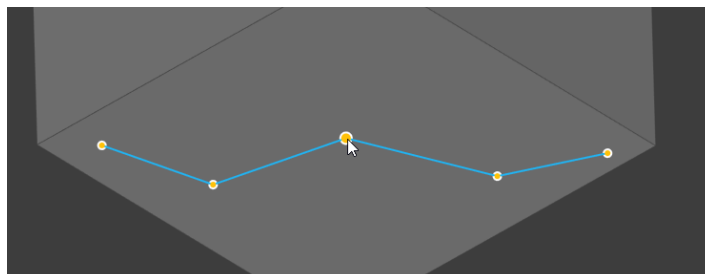
In-line angling for Tree support with one branch

In previous versions, angling **Tree support** was only possible using the **Vertical** option. **In-line** option of angling was added to Magics 28 to allow users to generate supports where branch is angulated together with the trunk, in this way reducing stress areas during metal printing.

Rescaling of Tree support

Tree (and **Tree***) support can now be rescaled in a similar way to other support types: interactively or by defining values manually. As a result of rescaling the **Tree** trunk and branch diameters are not changed and only the spacing between the trees is scaled according to X- and Y-factor.

Beam Lattice as No-Support Zones

Lattice beams can now be marked and added as **No-Support Zones** in the same way as the mesh of a part can. When generating automatic support, no support on graphs will be generated on the indicated parts of the beam lattice. When generating **e-Stage** support, the indicated parts of the beam lattice will not be included in the **e-Stage** support.
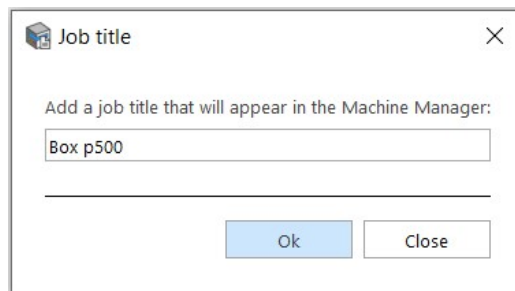
7 What's new - Integrations

7.1 Redirect to Machine Manager

It is now possible to create a draft job and get redirected to the Machine Manager terminal for Strategy assignment. A new **Create job** function has been added to the machine ribbon.
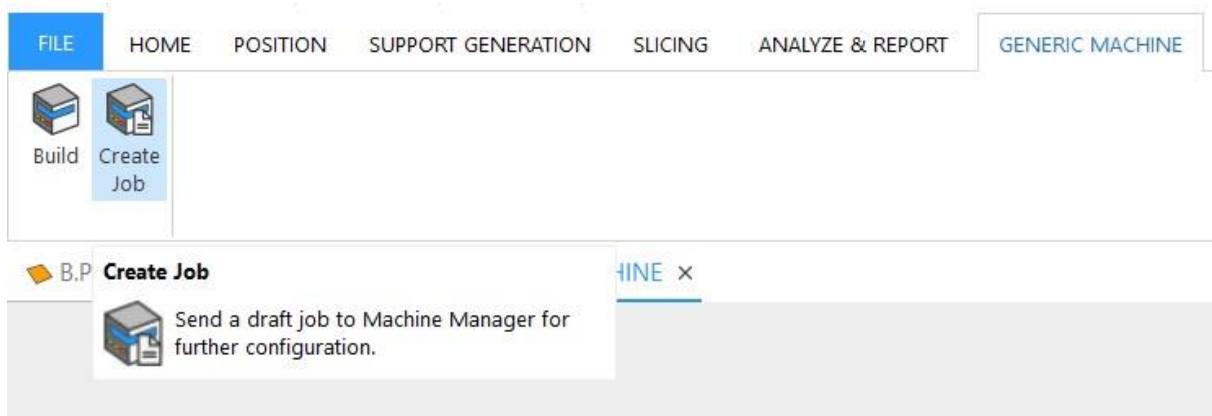
In the dialog that appears, the user can assign a job title for the Machine Manager:

The job will take some time to upload to the Machine Manager, after which the Machine Manager page with the draft job will open in the browser. Proceed to assign strategies in the Machine Manager.

7.2 Improved Open part flow towards CO-AM

In CO-AM interface there are multiple pages that give the option to open parts in Magics.

- Locate the **Open in Magics** button in CO-AM.
- Depending on the flow, select one or more parts and click **Open in Magics**.
- If there is one or more Magics instances already opened, then Magics will show a dialog for selecting an instance and scene for the part(s).

Select Magics instance	Open new instance	Select this option to open a new Magics instance.
	{Instance name}	Select this option to open parts in a Magics instance that is already opened.
Add part(s) to	Open scenes	All scenes available for CO-AM parts are listed in the order they are open in the selected Magics instance. All mesh part scenes are

		shown. Platform scenes created from CO-AM are shown.
	New scene	**New part scene**: All selected parts will be opened in a single part scene in Magics. **Individual part scenes**: All selected parts will be opened in individual part scenes in Magics, one part per scene.
Advanced options	The same behavior as the general Magics Import part flow.	
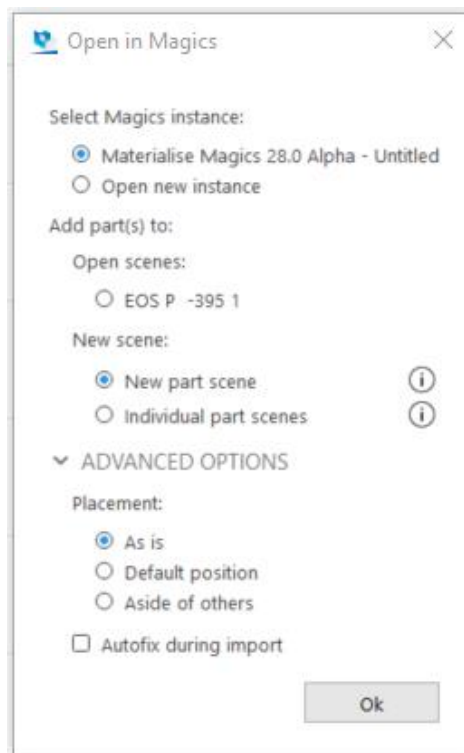
8 Known Issues

An overview of known issues can be found here: https://help.materialise.com/en_US/known-issues-magics.

9 Compatibility

9.1 Bundled components

Product	Versions
Magics	28.0.0.670 or 28.0.0.679 (*)
Solidware	28.0.0.284
CTools	28.0.0.284
MatConvert	10.9.0.21
Build Processor System	3.3.1 (**)
MatLicensing	7.5.3.1

* The only difference between 28.0.0.670 and 28.0.0.679 is related to a minor change in the optional usage data collection

9.2 Compatibility with other Materialise product releases (***)

Product	Versions
Streamics	9.0
Robot	9.0
3-matic	18.0
Simulation module	3.0.3
Ansys Simulation module	4.0
e-Stage	7.4
MatConvert	10.9
Build Processor System	1.7.16 (**)
CO-AM	release 1.0.100
CO-AM Machine Manager	1.13

For compatibility with specific Build Processors, please refer to the release notes of BPS and/or the specific Build Processor.

** The bundled BPS will only be installed/upgraded in case there is no installation yet of BPS, or in case the installed BPS is not compatible with Magics 28 (BPS version lower than 1.7.16).

*** Compatibility with newer versions of these products is expected unless explicitly mentioned in the respective release notes and is nevertheless limited to existing functionality only. Any new functionality in these products cannot be guaranteed to be compatible with Magics 28.

9.3 Compatibility with other CAD packages

Magics 28.0 comes with MatConvert 10.9, which supports the below CAD formats.

MatConvert is being released on a quarterly base, to ensure compatibility with the latest CAD formats, and can be downloaded and installed separately. More information can be found here: https://help.materialise.com/en_US/matconvert

Please note that the 'all imports' license is needed for all these CAD formats, except for importing STEP files.

Via 'Magics RP' base license		
STEP	*.stp, *.step	AP203 (E1, E2), AP214 (up to E3), AP242 (E1, E2, E3)
VRML	*.wrl, *.vrml, *.x3dv	1.0 and VRML 97, X3D 3.3
Via 'all imports' module		
IGES	*.igs, *.iges	Version 5.3
ACIS SAT	*.sat	Up to 2023 1.0
JT	*.jt	6.4 to 10.7
Rhino	*.3dm	Rhino 7.11
CATIA 5	*.CATPart, *.CATProduct	R10 to V5-6R2024
CATIA 6	*.3dxml	R2010x to R2024x
Pro/Engineer	*.prt, *.asm	2000i to Creo 10.0
Siemens NX	*.prt	15 to NX 2312 Series (until 2312.4000)
Parasolid	*.x_t, *.x_b	V7 to V36.1
SketchUp	*.skp	SketchUp 2023
Autodesk Inventor	*.ipt	9 to 2024
Revit	*.rvt	2011 to 2024
Solidworks	*.sldprt, *.sldasm	2006 to 2024
Solid Edge	*.par	10 to 2024

10 System Requirements

Hardware*	Software

CPU

- o Intel Core i7
- o AMD Phenom II X4/ X6 at 3.0 GHz or higher with SSE2 technology

Memory

- o 16 GB RAM or higher

Free Disk Space

- o Win 64-bit system
- o 2GB of free disk space

Display

- o 1920 x 1080 resolution or higher
- o 32-bit color depth (True color)

4K monitors work most optimal with scaling set to 125%

Video Card

- o NVIDIA GeForce GTX 1060' or AMD Radeon RX 480 or better
- o DirectX 11 compatible video card
- o At least 4 GB of memory
- o At least a memory interface width of 192-bit (256-bit is recommended)

Materialise Magics 28 **is only supported on** Windows 64-bit**:

- o Windows 11
- o Windows 10 version 21H2 or later

Materialise Magics 28 **is recommended on**:

- o Windows Pro edition
- o Windows Enterprise edition

Materialise Magics 28 **is not supported on**:

- o Windows 8.1 or earlier
- o Windows Server Editions
- o Virtualization systems such as VMWare

Materialise Magics **does not run** natively on **Mac OS X**, **Linux**, or **any other operating system** not listed above.

.NET 4.6 or later or a working internet connection during the installation is required.

* These hardware requirements are considered minimal for professional usage, but depending on the expected use cases (mainly influenced by project size, amount of triangles and number of parts) it is recommended to invest in appropriate hardware (more memory, larger disk size, ...). More info can also be found on: https://help.materialise.com/en_US/how-to-optimize-magics-performance

** Materialise Software will discontinue supporting an operating system, or a specific version of an operating system, from the moment that the OS vendor discontinues support.

11 Contact Information

For more information, check out our website: materialise.com/software/magics/

For technical support, click the **Online Support** button in Magics and check the local help pages (https://help.materialise.com/en_US/category-magics) or contact one of our Customer Support teams:

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