

# Product Overview



Materialise  
Magics

materialise

Magics RP gives you the tools to quickly prepare files for printing by focusing on printability, quality and speed.



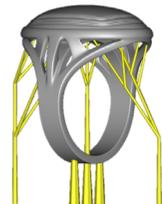
The **Import module** imports nearly all standard CAD files without the need for mesh conversion in separate software.  
e.g. CATIA, STEP, Siemens NX,...



The **Structures module** allows reduction in material usage, cost, printing time and weight and improves part quality.  
The **Slice-based Structures module** offers the same functionality with increased performance by creating geometry during slicing.



The **Support Generation (SG) module** identifies critical areas, generates supports for resin parts and allows manual fine-tuning.  
The **SG+ module** generates supports for metal parts including solid supports and trees for heat transfer. Saves time and improves quality.  
**SG resin (SLA, DLP) | SG+ metal (SLM)**



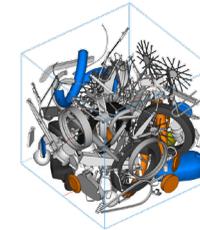
The **Tree Support module** prevents deformation, allows heat transfer, improves surface quality due to minimal contact points.  
→ Independent from SG, included in SG+  
**Metal (SLM) | Bottom-up resin (DLP, SLA)**



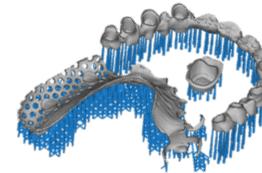
The **Volume SG module** provides solid raft supports which add to the stability of delicate parts.  
Binder jetting builds are automatically supported which allows the print to be easily lifted off the platform.  
**Binder Jetting (Metal & Sand) | Extrusion**



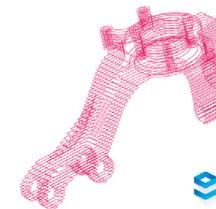
The **e-Stage module** provides semi-automatic supports. Avoids build failures, allows easy post-processing and reduces material usage.  
→ Separate version for resin and metal.  
**Resin (SLA, DLP) | Metal (SLM)**



The **Sinter module** fully automates the 3D nesting of your parts. Optimizes the build height, density and volume distribution.  
**Powder bed fusion (SLS, MJF, EBM)**

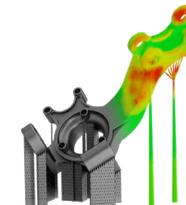


The **Dental module** allows for easy and fast build platform preparation and support generation for the dental industry.  
**Metal (SLM)**



The **Build Processor** links Magics to your 3D printer so they communicate smoothly, allow you to define build strategies and transfer data in a clear way.

The **Slice module** generates job files (SLC and CLI) which can be interpreted by 3D printers.



The **Simulation module** predicts part behavior during printing.  
Helps with support optimization and compensation of part deformation.  
**Metal (SLM)**

# Detailed Module Overview

## MAGICS

**Import & Export:** Most of the industry standard mesh based file formats can be imported and exported, including color textures and colors (image on the right). By default, you are also able to import Rhinoceros and Sketchup files, as well as export 3D PDF files. Additionally, you can get the import module (below) for more options. After preparing your build platform you can also export all parts and supports separately or all at once. With these import and export options at your disposal you can save time and improve quality of your files.

**Fixing:** We provide state of the art automatic and manual fixing tools to make sure your mesh files are printable. Save time, ensure quality and avoid build crashes with our quick and easy to use tools.

**Editing:** With our range of tools you can make the necessary adjustments to your designs for optimizing the printability. Among these tools are offset, fillet, hollow, cut and label. Having these possibilities all in one program saves both time and money. The tools available in Magics are especially

focussed on the Additive Manufacturing industry, providing you with parameters that you can customize to your 3D printing needs.

**Build Preparation:** When your part is ready for printing you can load it onto a build platform, with our software we offer an extensive library of different machine platforms which are fully customizable. On this platform you can arrange different parts using our placement and orientation tools that help you find the optimal placement to ensure part quality. This minimizes the time you spend on manual placement as well as optimizes the build volume usage which will reduce printing time.

**Analysis:** You can use analysis tools to investigate both your parts and your platform set-up. You can for example measure aspects of your part and analyze the wall thickness, for the platform you can look for interlocking and colliding parts, or parts outside your build volume. These tools will ensure your file is printable, ensure good part quality and reduce scrap rate saving you both time and money.



**Reporting:** With the professional quality reporting you can verify and compare printed parts to your initial design. A large set of Excel and Word Templates are at your disposal to use and customize (e.g. extract nearly any parameter from magics to set-up a fully custom quote or report). The ability to easily generate information such as measurements, nesting density and cost estimation within the software will save you time and will improve communication, both within your team and with clients.

	Import	Export	Texture	Color		Import	Export	Texture	Color
OBJ	■	■	■	■	DXF	■	■	■	■
VRML	■	■	■	■	DAE	■	■	■	■
X3D	■	■	■	■	FBX	■	■	■	■
ZPR	■	■	■	■	3DM	■	■	■	■
3MF	■	■	■	■	3DS/PRJ	■	■	■	■
PLY/ZCP	■	■	■	■	SKETCHUP	■	■	■	■
STL	■	■	■	■	3D PDF	■	■	■	■
AMP	■	■	■	■					

## Import Module

The Import module lets you import common CAD files (image on the right):

STEP, IGES, CATIA5, CATIA6, JT, Inventor, NX (unigraphics), Parasolid, Pro/Engineer, Revit, SAT, Solid Edge, Solidworks, VDA(no color support)

### Functionalities:

- When importing a CAD file the parameter pop-up allows you to determine how to convert the part to mesh: surface accuracy, edge length, number of triangles, import colors, automatic fixing options...
- Only applicable to M26: Convert a CAD file to BREP in Magics to allow usage of BREP tools (VDA excluded).

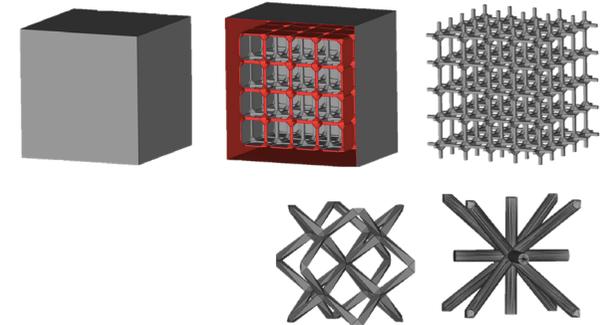
	Import	Color		Import	Color
CATIA4	■	■	PRO/ENGINEER	■	■
CATIA5	■	■	REVIT	■	■
CATIA6	■	■	SAT	■	■
IGES	■	■	SOLID EDGE	■	■
JT	■	■	SOLIDWORKS	■	■
INVENTOR	■	■	STEP	■	■
NX (UNIGRAPHICS)	■	■	VDA	■	■
PARASOLID	■	■			

## Structures Module

By replacing the solid core of a part or the entire 3D part with a lightweight structure the material cost, part weight and printing time is reduced while structural integrity is maintained. The generated mesh dimensions and thickness are dependent on the base structure. This module allows you to quickly generate lightweight structures. By reducing part volume, the part quality increases by the reduction of heat related risks.

### Functionalities:

- Creating structures within a part (outer shell) or replacing the entire part with structures (no outer shell)
- Uniform unit cell library available and the ability to create custom unit cells
- Adding drain holes for resin/powder removal



## Slice-based Structures Module

Thanks to our slice-based technology you can avoid mesh generation by creating the lightweight structures during the build preparation process. The structures are thus generated upon slicing the part during build job generation using one of our Build Processors. Slice-based technology makes large design files with internal structures more manageable. It only renders a representative model, while the actual files are not yet produced on mesh level. This greatly reduces the file size making it easier and faster to work with and reduces the need for large data storage.

### Functionalities:

- Creating structures within a part or replacing the entire part with structures
- Library of many structural shapes and the ability to create a structural shape yourself
- Adding drain holes for powder removal

**Use case: Fiberneering** prints large parts using SLA. Interior structures reduced the material cost significantly while the part maintained good structural integrity and even an improved part quality (warp reduction). Without the slice-based module the parts were too large and handling them required a lot of time. The Slice-based Structures module reduced the preparation time with 90%.

# Detailed Module Overview

## SG Module

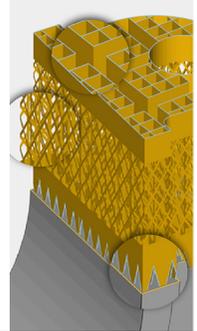
Resin  
(SLA, DLP)

The SG module provides an extensive toolbox for support generation for stereolithography machines. With the customizable non-solid supports structures your parts will be automatically supported, reducing build failures and scraps and optimizing the surface and part quality. The ability to make custom support profiles helps you adjust the settings to your

needs in order to ensure good part quality, reduce post-processing time and material consumption (e.g. perforations aid in resin removability, small contact points minimize post-processing time, ...). Combined this tool will lead to reduction in time and cost.

### Functionalities:

- Customizable non-solid supports (point, web, block, line, contour and gusset)
- Setting up reusable support profiles



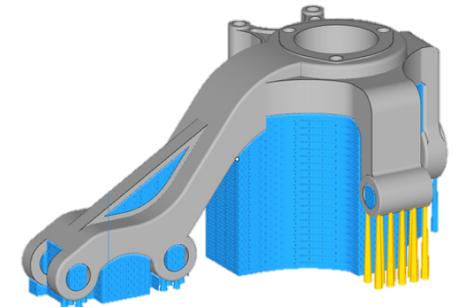
## SG+ Module

Metal  
(SLM)

The SG+ module provides an extensive toolbox for support generation, specialized for metal 3D printing to maximize the productivity of your metal AM machine. With the combination of the customizable non-solid and solid structures your parts will be optimally supported as well as allow for good heat transfer to avoid detachment or warpage. This minimizes build failures and ensures great part quality. Perforations in the support allow for good recuperation of powder.

### Functionalities:

- All support type parameters are fully customizable, your preferences can be saved as a profile
- Non-solid supports exist in multiple geometries and support your part
- Solid supports such as cones and trees allow for heat transfer
- Ability to angle and rescale supports with an interactive user-interface
- The 'Transfer support' function lets you automatically position and support other parts of similar geometry based on a master part



## Volume SG Module

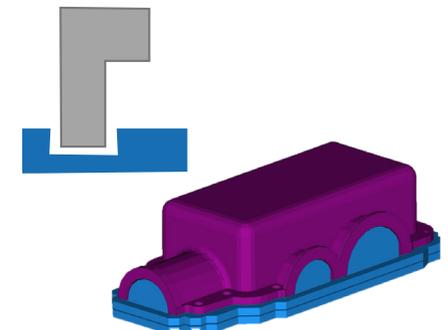
Binder Jetting  
(Metal & Sand)

Extrusion  
(FDM)

The volume SG module contains all support functionalities but is limited to only one type, the volume support. This module is primarily aimed for the binder jetting technology, where support are not needed for the printing step but are used as a "stand" for the printed parts during the heat treatment step (debinding & sintering). It can also be used in extrusion, especially to support thin walls.

### Functionalities:

- Raft: The raft is intended to be used as a sacrificial element, to avoid smearing, i.e. the "spreading" of material created during powder deposition. The raft immobilizes the part in the powder bed and thus reducing the risk of potential smearing, improving part quality.
- Stabilization wall: these walls are a new kind of support aimed at extrusion technologies like FDM and HSE. For long, thin parts, this feature decreases the effect of vibrations due to the movements of the extruder, improving the quality of the part.



## Tree Support Module

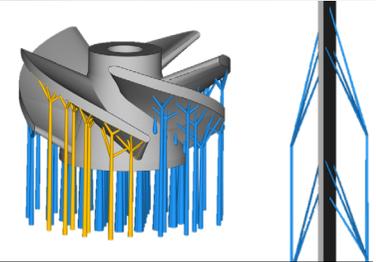
Metal (SLM)

Bottom-up Resin (SLA, DLP)

The Tree support module is beneficial when printing small and delicate parts. These solid trees provide good heat conduction, small and a minimal amount of contact points that are easy to remove. This prevents deformation and leads to good surface finish. The trees are also well spaced allowing for easy powder recuperation.

### Functionalities:

- Both automatic and manual tree support generation
- Branch nodes and connections can be easily moved, added or deleted
- Custom trees can be made to support very thin vertical surfaces



**Use case:** *Progold* was able to support their small precious parts using Tree Supports. Leading to reduced manufacturing time and increased productivity.

## e-Stage

Resin (SLA, DLP)

The e-Stage module for resin automates your support generation process for SLA and DLP technologies. Time and cost savings are achieved both by providing a one-click solution in the software to create an optimal support structure, as well as the needle shaped contact points that allows for easy removal. The algorithm can reduce data preparation time by up to 95% and finishing time by up to 25%. Our customers have also decreased their resin consumption for support structures by up to 50% thanks to the open diamond structure of the e-stage supports.

### Functionalities:

- Automated generation of support structures for DLP and SLA
- Extensive parameter list to tweak the algorithm for your machine and needs



**Use case:** *Raging Heroes* is a company based in France that creates collectable miniatures. They were spending between 20 minutes to one hour generating the support structures for each DLP build. Using e-Stage, they reduced their support generation time by up to 92% (less than 5 minutes per build)

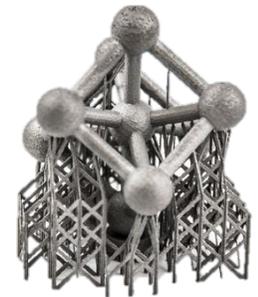
## e-Stage for Metal

Metal (SLM)

The e-Stage for metal module automates your support generation process for metal parts. The parameters of the supports can be fully customized to the material you use. Once this is set up the supports are generated in just one click. This automation allows you to reduce both time (data preparation and support removal) and costs (better supports lead to minimal scrap parts). In addition, the design of the e-Stage support structures allows for optimal powder removal (nearly 100%), resulting in optimal powder usage and recycling leading to decreased costs.

### Functionalities:

- Automated generation of support structures for metal builds
- Extensive parameter list to tweak the algorithm for your machine and needs
- Ability to customize the position of contact points



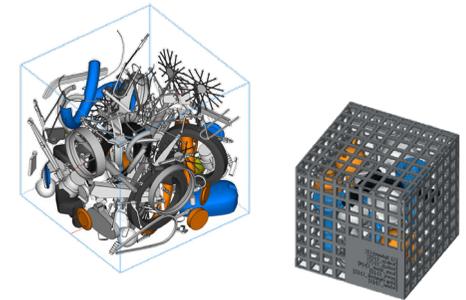
**Use case:** *Volum-e* is specialized in the Additive Manufacturing of plastic and metal parts, both prototypes and end-use parts. e-Stage enabled them to make the support generation 80% faster and the support removal 50% faster. Other customers were able to reduce their data preparation time for metal builds up to 90% and their finishing time up to 50%.

## Sinter Module

The Sinter module allows you to nest your 3D models in a controlled way. Next to being a smart and very fast 3D nester, it also offers advanced options to protect small parts, indicate no-build zones and print on multiple machines. You can rely on our software's powerful, accurate and incredibly fast multi-core nesting algorithms, but also adapt parameter settings for every situation. The slice volume optimizer reduces variation in the surface area printed in each layer, leading to less temperature variation, resulting in less shrinkage and better part quality. Save time and increase the nesting density to include more parts in one build.

### Functionalities:

- Geometry 3D nesting algorithm
- Slice volume optimization
- Multi-platform placement
- Sinter boxes and sub nester for delicate parts
- Add parts to an already ongoing build



**Use case:** *Nissan* switch from Manual placement to the Sinter Module. This increased the capacity of a single build job, reduced the number of labor hours, the amount of printer occupancy time for operations such as data preparation, printing time, and cooling time, and the amount of wasted raw materials. As a result, the entire 3D printing process is now more efficient!

**Powder Bed Fusion**  
(SLS, MJF, EBM)

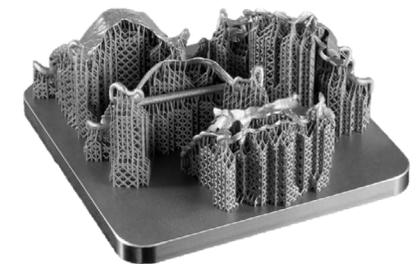
## Dental Module

› CLASSIFY › FIX › ALIGN › LABEL › SUPPORT › NEST

The Dental Module performs the full data preparation workflow required for printing metal dental parts. Crowns, bridges and partials are automatically classified. With one click of a button, the imported models are fixed, oriented, labeled, supported and nested, all according to the classification. Lastly, reports are generated for maximum traceability.

### Functionalities:

- Complete platform automation for metal dental printing applications
- Set up custom profiles for your specific requirements and part types



**Metal**  
(SLM)

## Simulation Module

The Simulation module is a tool that lets you predict possible printing risks and part artefacts of your SLM build before printing, or it can help you understand previous build failures. Mechanical and thermal simulations help you interpret part behaviour during printing (deformation, shrinklines, recoater collision, overheating...). Simulation is an easy to use tool and does not require expertise, same person can prepare the build and run the simulation. This saves time and reduces costs. The simulation results help you improve your design and supports, so you can print it right the first time and minimize time to market.

Metal  
(SLM)

**Use case:** *Materialise Medical* was able to choose the right orientation and support configuration for CMF (cranio-maxillofacial) implants, ensuring the part experienced minimal deformation.

### Functionalities:

- Run thermal and mechanical simulations (calibrated to your machine and material)
- Automatic part modification to compensate for distortion
- Adaptive support creation based on the simulation

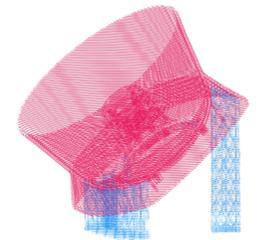


## Slice module

With the Slice module you are able to export your part or entire platform as slices instead of in a mesh format. This lets you create the slices in Magics, after which you can load them into your AM machine straight away. Included formats are CLI, SLC, SLL and F&S. This will simplify job generation, save you time and remove the need for multiple programs, making it both faster and cost beneficial.

### Functionalities:

- Save parts as slices
- Magics also allows you to preview the sliced part



## Build Processors

3D printers are complex, so between designing a part and 3D printing it, there needs to be an intermediate step that connects data to the machine in a clear, unambiguous way. Build processors provide this seamless connection between software and hardware making this complex process straightforward and greatly improving your productivity.

- Integrates seamlessly into workflows
- Provides control over process parameters
- Robust processing keeps file sizes small
- Communicates printing information
- Monitoring machine parks
- Developed with machine builders

MAGICS

CONFIG. JOB

EDIT PROFILES

ADVANCED OPTIONS

SUBMIT JOB

JOB QUEUE