Materialise 3-matic
Modules

3-matic enables you to clean up rough data from a CAD design, topology-optimized model, simulation, or scanned data by making design modifications on the mesh level. Enhance models for 3D printing with 3D textures, lattice structures, conformal structures, and scripting automation to easily create ranges of validation samples — improving your overall productivity.

This document gives an overview of the different modules that are available for 3-matic, allowing you to customize the product to fit your specific needs.

If you're interested in 3-matic and its modules, contact us

materialise
innovators you can count on

Index

Texturing Module

The look and feel of a part is crucial to the success of a product design. It largely defines the esthetics of a part, but can also lead to added functionality or improved performance. With the **Materialise 3-matic Texturing Module**, you can efficiently create 3D textures, perforations and patterns directly on the STL file (which can later be printed with RP/AM technology). In addition, you have the flexibility to quickly change and preview 3D textured components without having to share your designs with external suppliers.

Why Add 3D Textures to Your Model?

Add Functionality to Your 3D Model
- Benefit from biomimicry and bionic engineering design possibilities
- Increase grip
- Improve aerodynamic properties
- Change acoustic properties
- Control density with perforations

Improve the Aesthetic Value of Your 3D Model
- Enjoy freedom of design
- Create a unique or personalized object
- Cover up 3D printing layers (and avoid finishing work)

Reasons to Choose the Texturing Module

✓ Choose 3D textures from a large library

✓ Create seamless textures without stretch marks by using procedural leather textures

✓ Add custom textures to existing library

✓ Work on complex, irregular surfaces with high accuracy

✓ Handle large and complex designs easily with our unique slice-based technology

✓ Create Python scripts to automate your texturing workflow

Using this software, we can relatively easily generate textures and structures on a part. Additionally, it makes it possible to perform structural design operations on STL files. There is hardly any other software on the market which makes this possible."
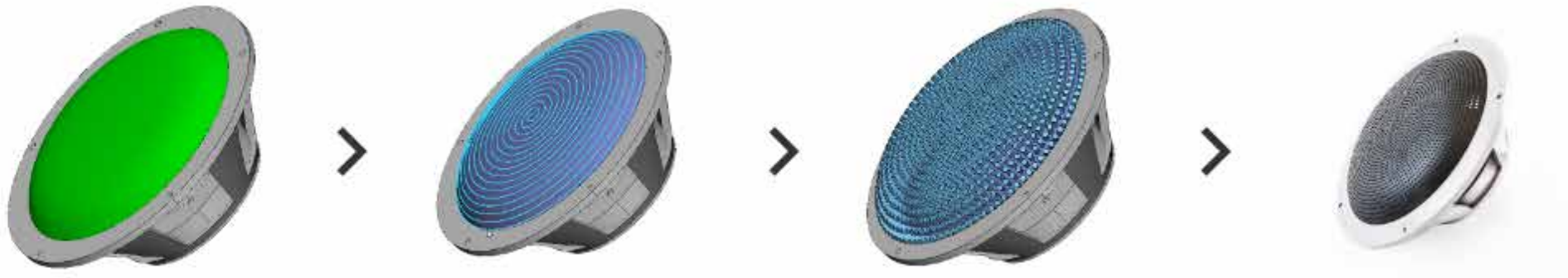
- Romuald Siegert, Rapid Technologien, BMW Group, Germany

How to texture a 3D model?

Start from a 2D bitmap and easily convert it into a 3D texture using our texturing software:

For perforations or 3D patterning, use a single pattern element to design an elaborate 3D patterning:

Texturing at Once: Easily Apply Textures to Hundreds of Complex Surfaces

With the Texturing Module, you can efficiently apply hundreds of 3D textures directly on the STL file while keeping the file size and triangle count to a minimum. In addition, you can handle highly complex surfaces efficiently and have full control over the creation of new textures.

Thanks to the integrated slice-based technology of the **Materialise Build Processor**, the demanding creation of triangles to an intermediate STL file is skipped and the desired geometry is generated directly onto the slices, avoiding large data. The Texturing Module allows designers to immediately include hundreds of textures in their design, skipping the tedious post-processing steps.

Key Benefits of the Texturing Module

- Reduce lead time
- Experience freedom of design
- Keep confidential files in your company
- Work on irregular surfaces
- Use textures that were unavailable before
- Blur striations

Textured shoe sole, 3D-printed at Materialise using 3-matic texturing software.
453 surfaces were textured and aligned, saving at least 80% of time compared to 1-by-1 texturing.

Lattice Module

Nature uses precisely designed structures to create shapes that fit the needs of strength, flexibility and rigidness while still keeping them as light as possible. Manufacturing similar lattice structures has always been challenging and often impossible to achieve with traditional manufacturing technologies.

One of the key advantages of 3D Printing is the flexibility to create shapes which are impossible or too costly to produce with traditional technologies. The **Materialise 3-matic Lattice Module** realizes one of the most promising potentials of the 3D printing industry: optimizing your designs and translating them into components with a lattice structure.

Why Choose the 3-matic Lattice Module?

Materialise 3-matic allows you to create 3D printable internal and external structures that add extra strength, provide cushioning, increase porosity, or simply reduce the weight of your design. It is compatible with data preparation software **Materialise Magics** and **Materialise Build Processor**, which means that the limitations and issues related to computation of complex structures are completely bypassed.

Whether it is for research purposes or for end-use, Materialise 3-matic offers the tools you need to optimize your design, including Python scripting to automate your process and increase efficiency.

Choose from a Wide Variety of Creative Designs

• Uniform structures
• Voronoi structure
• Randomized structures
• Mesh-based structures
• Quad-based structures
• Conformal structures

For each structure, you have the option to create organic connections between the lattices in order to increase lattice performance and design flexibility

Add or Design Unit Structures

• Use unit structures from the internal library

• Design your own structures in CAD and import them to Materialise 3-matic to grow your own library

Optimize Designs Based on Analysis

• Analyze the strength of the design with FEA and reinforce the structure density where needed

• Control the thickness of your model according to design requirements

• Control the porosity and density of Voronoi lattice structures

Ensure Build Ability

• Perform analysis to test if the design is 3D printable

• Process complex designs via the slice-based technology of the Materialise Build Processor

Scripting Module

Automating your workflow is your best bet to save time and increase consistency and productivity. The **Materialise 3-matic Scripting Module** is designed to do a lot of the legwork for you by automating repetitive work, leaving you free to focus on more interesting tasks. Once workflows are codified, you will be able to work in a highly efficient way that minimizes the risk of human error and allows you to get the job done a whole lot faster.

Mass customization is tangible with this module: scale up your work from one custom design to 10, 20, or even hundreds of designs, whilst still maintaining the option to customize every individual design when needed.

Python allows for customizing user interfaces that interact with 3-matic, making the UX more user-friendly and consistent.

To ensure that you hit the ground running, the **Scripting Module** includes extended API documentation as well as tutorials, and our Software team is always there to provide support.

innovators you can count on

Use the Scripting Module to:

▶ Create time-saving automated workflows
▶ Mass customize your designs
▶ Scale up your research
▶ Tailor 3-matic to your needs

Key benefits of the Scripting Module

▶ Achieve more consistency results between different users
▶ Avoid human error
▶ Do more design iterations/variations
▶ Create a workflow that could easily be expanded and adapted for future projects
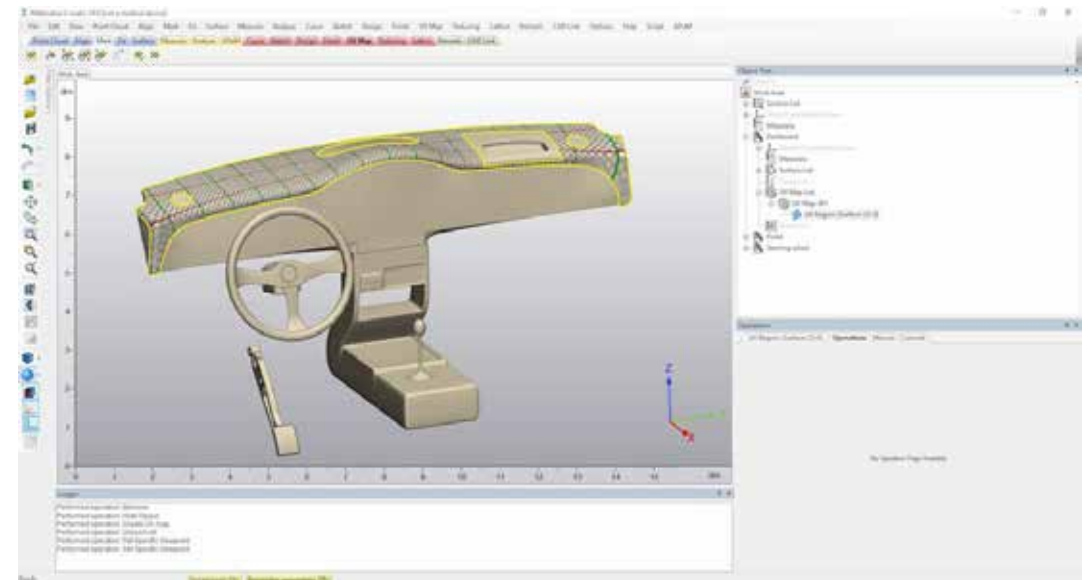
Import Module

With the **Materialise 3-matic Import Module**, you can create STL data from native and non-native CAD data, including IGES, VDA, Vrml, Catia V4, V5 and V6, UG, Pro-E and STEP files. In addition, it offers import and meshing functionality for point cloud data.

CAD Link Module

The **Materialise 3-matic CAD Link Module** gives you the possibility to easily bring your file back to CAD and CAM environments. As a combination of the segmentation tools and intelligent automatic splitting, and our new Quad Dominant patching method, this module offers you the complete solution to convert STL files to IGES or STEP, optimized for processing in CAM software.

Included in the conversion is a feature recognition where the basic analytical shapes will be converted with the correct parameters, while the organic regions will be converted to NURBS to obtain a fully parametric design.

The **CAD Link Module** is available through scripting so you can increase your productivity.

Remesh Module

The **Materialise 3-matic Remesh Module** allows you to fully prepare your parts for CAE applications. The surface mesh is optimized through different manual and automatic remesh operations, which control the quality and size of the part's surface triangulation.

The **Remesh Module** also offers a volume meshing functionality, which lets you create Tet4 and Tet10 volume meshes. These surface meshes and volume meshes can be exported to Fluent, Ansys, Abaqus, Comsol, Patran and Nastran file formats. Additionally, the lattice beams designed in Materialise 3-matic can be exported to Abaqus and Optistruct, which allows you to fully analyze the structural integrity of your lightweight part before printing.