



materialise

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Materialise Magics Dental Module

1.1

User Guide

Revision : September, 2021



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Table of Contents

1. About This Manual	5
2. Installation	6
2.1. Minimal System Requirements	8
2.2. Licensing	9
3. Introduction to Magics Dental Module	10
4. Prepare Platform	11
4.1. Import Parts to Dental Platform	13
4.2. Managing Profiles	14
4.2.1 Select Profile	14
4.2.2 Add new Profile	15
4.2.3 Edit Profile	16
4.2.4 Delete Profile	16
4.3. Classification of Part Types	18
4.4. Placement Options for Parts	19
4.5. Start Platform Preparation	20
5. Approve Platform	21
5.1. Grouping Parts	22
5.2. Input and Output Folders	23
6. Logging and Reporting	25
6.1. Logging Functionality	25
6.1.1 Log Files from Platform Preparation	25
6.1.2 Log Files from Platform Approval	25
6.2. Approval Report	26
7. Build Platform	28
8. Frequently Asked Questions	31
8.1. Use of the Dental Module	32
8.1.1 “Prepare Platform” Dialog	32
8.1.2 “Approve Platform” Dialog	33
8.2. Parameter Settings	34
8.2.1 Parameter Profiles	34
8.2.2 Part Alignment	35
8.2.3 Part Classification	35
8.2.4 Part Placement	36
8.2.5 Part Labels	38
8.2.6 Support Type - Cones	38
8.2.7 Support Type - Scaffold	40
8.2.8 Dental Platform	43
8.2.9 Dental Application “Crown”	44



8.2.10 Dental Application “Bridge”	46
8.2.11 Dental Application “Partials”	48
8.3. Unexpected Results	49
8.3.1 Part Placement on Platform	49
8.3.2 Part Labels	50
8.3.3 Part Orientation	50
8.3.4 Approve Platform	50
8.4. Warnings and Errors	51
8.5. How to add more parts to an existing Dental Platform	53
8.6. How to print parts that were not automatically prepared	53
8.7. How to add new parts to an existing part group that has scaffold supports	53
8.8. How to assign classification and placement options to a group of parts	54
8.9. How to delete single cone supports	55
9. References	56
9.1. Part Types	56
9.2. Profile Editor Parameters	56
9.2.1 Labeling	56
9.2.2 Reduced Defect Sensitivity	58
9.2.3 Supports	58
9.2.4 Part Placement Options	62
9.3. Typical Warning Messages	64
10. Tutorials	66
10.1. Tutorial: Getting Started	66
10.2. Tutorial: Working with Defective or Non-alignable Parts	81
10.3. Tutorial: Obtaining a Completely Filled Platform	88
10.4. Tutorial Preparing a Platform with Already-Prepared Parts	97
10.5. Tutorial: Adding New Parts to an Existing Platform with a Scaffold Support	103
10.6. Tutorial: Adding Parts to a Platform Containing Parts with Directed Labels	108
10.7. Tutorial: Using Regular Expressions to Create Label Texts	112
10.7.1 Prerequisites for Regular Expressions	112
10.7.2 Ready-to-use Regular Expressions for the Dental Module	112
10.7.3 Overview of Rules for Regular Expressions	114
11. Contact and Technical Support	115

1. About This Manual

This manual describes how to work with the new Materialise Magics Dental Module.

The following symbols will guide you:



This is a technical requirement.



This is an important notice.



This is a warning.



Jump here to continue the Dental Workflow.



See also

First user? Start with this tutorial:

-  *Tutorial: Getting Started* on page 66

This manual contains information regarding the following:



Installation on page 6



Minimal System Requirements on page 8



Licensing on page 9

Dental Workflow descriptions:

-  *Prepare Platform* on page 11
-  *Approve Platform* on page 21
-  *Build Platform* on page 28



Frequently Asked Questions on page 31



Logging and Reporting on page 25



Profile Editor Parameters on page 56



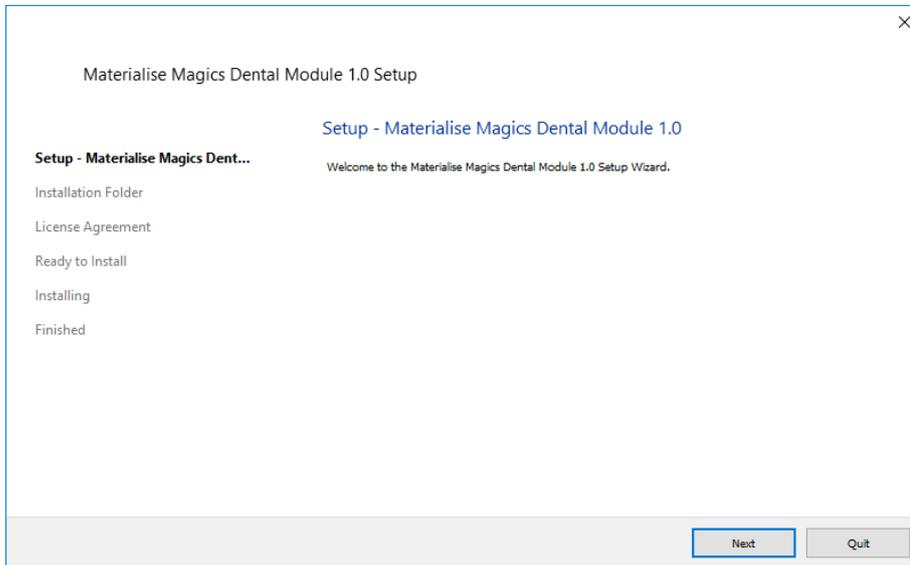
Typical Warning Messages on page 64



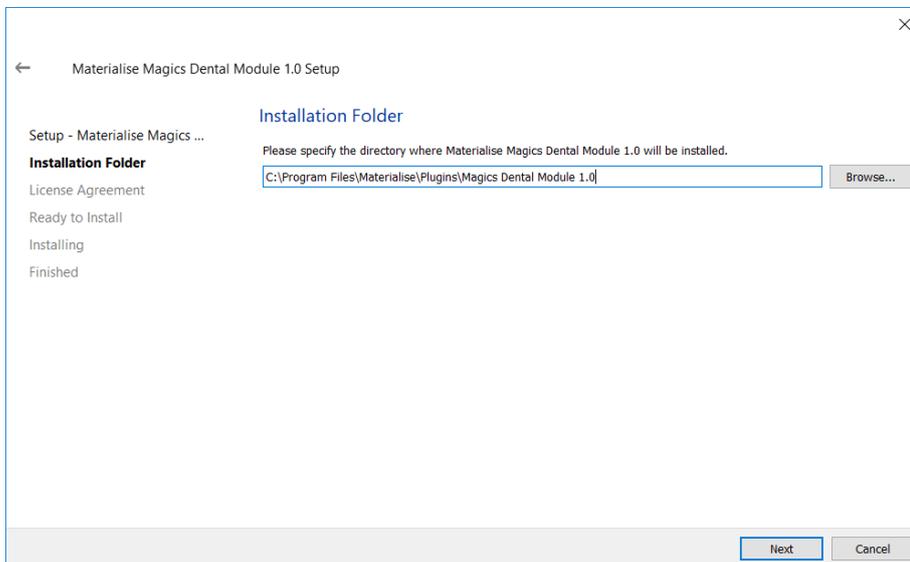
2. Installation

You can install Magics Dental plug in following the steps below:

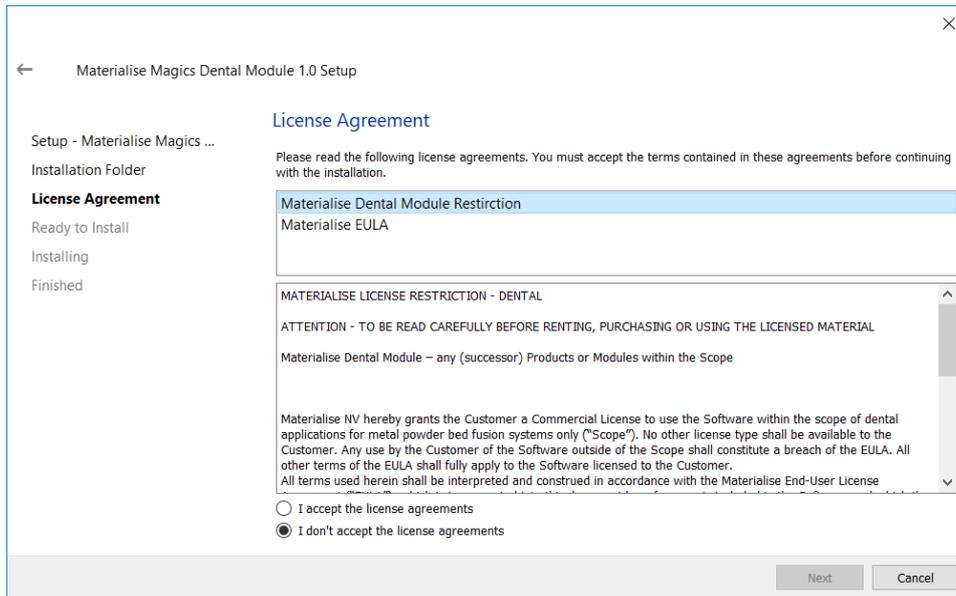
1. Open the provided installer and click **Next**:



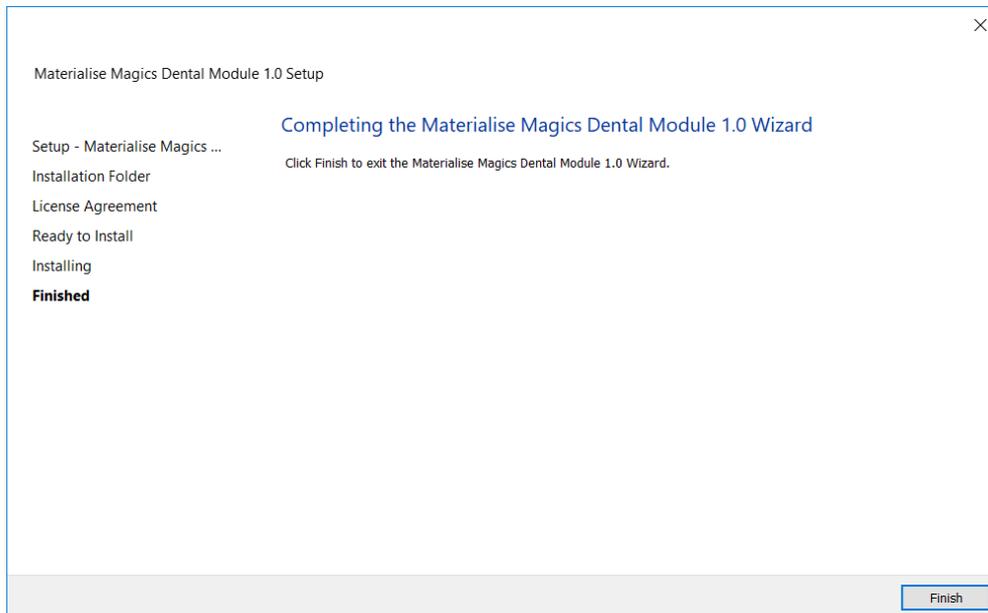
2. Choose a directory where the Dental Module will be installed. A default directory is provided. If you wish to change it, click **Browse...** and choose the directory you wish to use. Click **Next** once you are done.



3. After reading the License Agreements, click **I accept the license agreements and Next**.



4. Click **Install** when you are ready to start the installation process.
5. Once the installation has completed successfully, the following window is shown. Click **Finish** to close the installer window.



2.1. Minimal System Requirements



To be able to use Magics Dental plug in you must have Magics Print or Magics RP in version 25.02 installed. Furthermore, it is recommended to have a Build Processor installed.

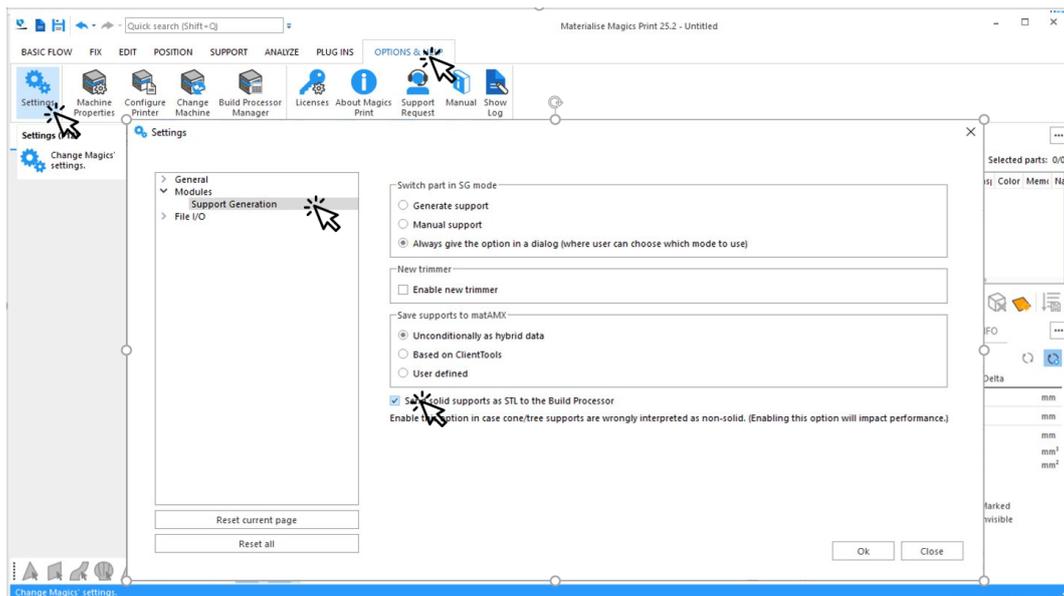
Please refer to the Magics 25 User Manual and the user manual of your installed Build Processor for further minimal system requirements.



For **Magics Print** users only: In order for the Dental Module to work correctly you must disable the **Send solid supports as STL to the Build Processor** option.

To do this:

1. In Magics Print, go to **Options & Help** ribbon and select **Settings**.
2. In **Modules** options select **Support Generation**.
3. Disable the **Send solid supports as STL to the Build Processor** option.

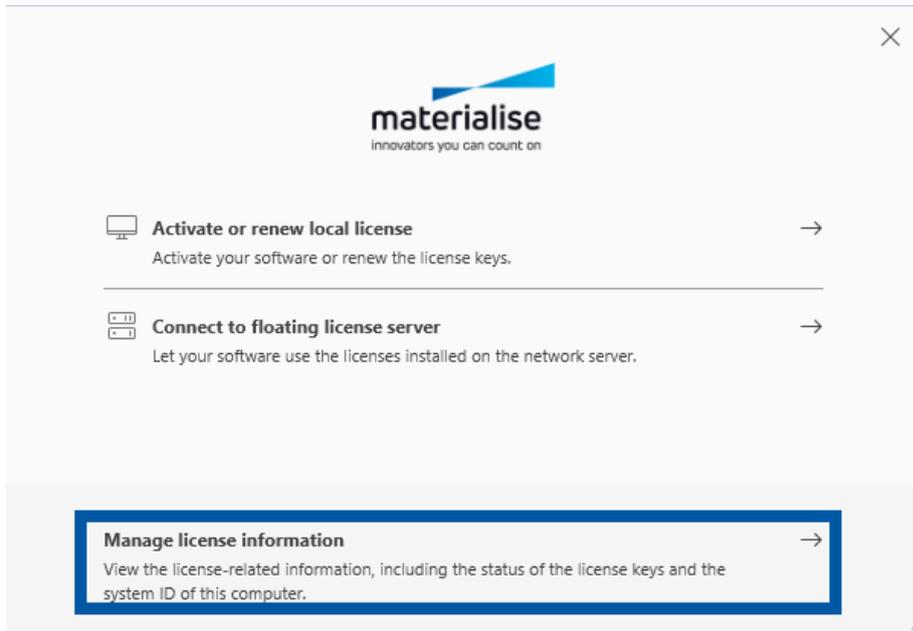


4. Click **Ok** to Save.

2.2. Licensing

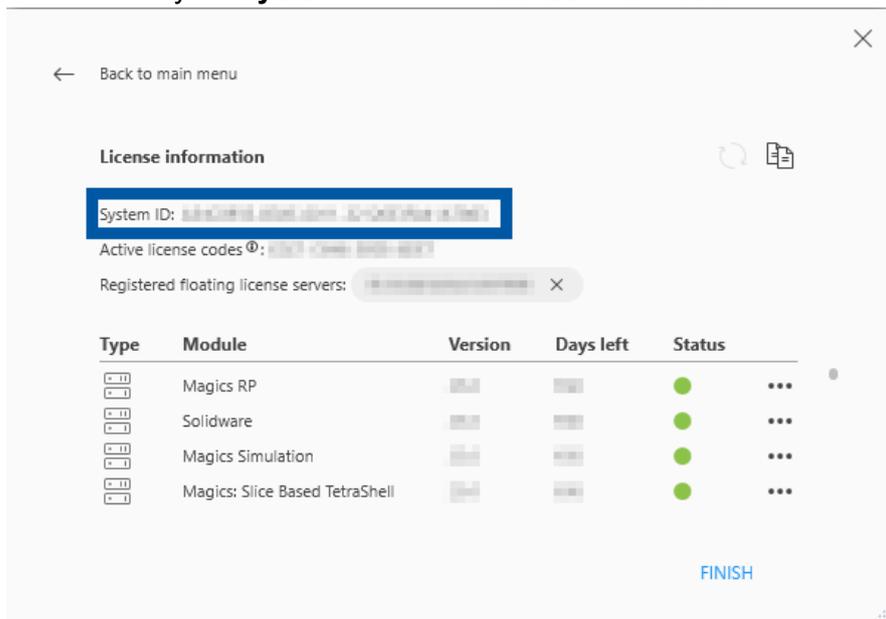
In order to run the Magics Dental Module with Magics it needs to be licensed.

In Magics go to **Options & Help** ribbon and select **Licenses**. The Licensing dialog is displayed:



To find your **System ID**:

1. Click **Manage License Information**.
2. You can see your **System ID** under **License information**.



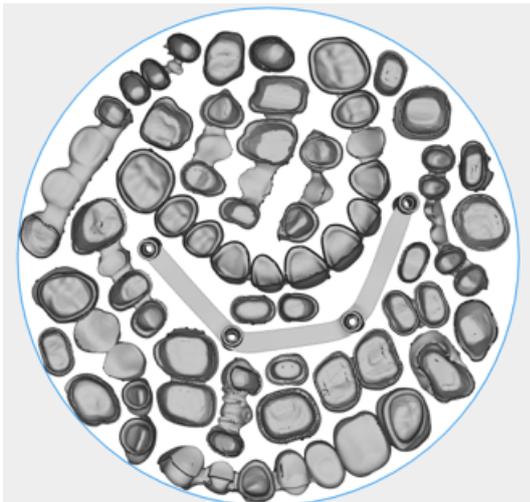
See [this tutorial](#) on YouTube to learn about how to register key files.

3. Introduction to Magics Dental Module

The Materialise Magics Dental Module is a software for fully automated 3D print preparation for dental prostheses.

In this first version, the Magics Dental Module supports the most important dental applications such as:

- crowns,
- bridges, and
- removable partial frameworks.



The Dental Module will classify, repair, position, orient and support your dental parts in an optimal way.

Highly efficient digital workflows for these dental applications were developed in cooperation with dental laboratories and machine manufacturers.

Flexible settings allow for adaptation to lab-specific experience for dental 3D printing with minimum post-processing and maximum print reliability.

The combination of the Dental Module with Materialise Magics and a machine-specific Build Processor provides the best of three worlds for 3D printing of dental applications: **Powerful automation** combined with superior 3D print preparation and build job generation with state-of-the-art building strategies.

The Dental Module works in the following three steps:

1. *Prepare Platform* (see page 11)
2. *Approve Platform* (see page 21)
3. *Build Platform* (see page 28)

4. Prepare Platform

The Dental Module performs many different operations automatically one after the other. The aim of the first step in this process is to prepare all parts in such a way that they can be approved afterwards.

To start the process:



Before preparing the Dental Platform make sure you carried out all these instructions correctly.

1. In Magics create scene and select machine
 -  [Magics 25 User Manual](#)
2. Import parts
 -  [Import Parts to Dental Platform on page 13](#)
3. In Magics on ribbon **Plug-Ins** select **Prepare Platform** option.
4. Select correct profile
 -  [Select Profile on page 14](#)
5. Optional: Classify part type
 -  [Classification of Part Types on page 18](#)
6. Optional: Select placement option
 -  [Placement Options for Parts on page 19](#)
7. Click **Start**.

The following operations are carried out when creating the Dental Platform:

Classification

During the classification step, the Dental Module determines the type of part: crown, bridge, or partial. If the classification is not successful the part is flagged as 'unknown' and discarded for further processing.

Fixing

Parts are fixed if necessary using Magics auto-fixing as appropriate.

Positioning

The individual parts are translated and/or rotated as applicable and as selected to achieve the best orientation and position for each part type.

Labeling

Part labels are created and applied if labeling is activated in the selected profile.

Nesting

The software will pack as many parts as possible onto the build platform while maintaining correct orientation and optimal position.

Support Generation

Parts are supported with cone or scaffold supports if support generation is activated in the selected profile. The type of support is determined per part type in the selected profile.

8. When the Dental Platform has been created successfully you can **Close** the dialog.

Some parts were not placed on the platform?

To determine which parts switch to top-down view:

- Crowns are shown to the left of the platform
- Bridges above
- Partials to the right of the platform

What does the coloring of some parts mean?



If a part has been colored, the Dental Module encountered some problem with the part. These parts are never placed on the platform.

- Red: Part could not be fixed.
You need to use the Magics functionality to fix the part yourself.
- Yellow: Part orientation uncertain.
This can happen for crowns and bridges and means that the occlusal surface could not be determined with enough certainty. You need to manually determine the orientation.

 *How to add more parts to an existing Dental Platform on page 53*

 *Logging Functionality on page 25*

 *Typical Warning Messages on page 64*

 *Approve Platform on page 21*

4.1. Import Parts to Dental Platform



Before importing any parts, make sure to select your machine and create a scene in Magics.

To import parts into current scene you have three options:

- Select **Import 3D Model** from context menu in Magics (right-click in workspace).
- Drag & drop part files from Windows Explorer.
- Select **File > Load > Import Part** in Magics.



The name of the part files have no effect on the workings of the Dental Module.



Magics may prompt you to select a certain part orientation. You can select any orientation. Dental Module will determine the optimal orientation when creating the Dental Platform.



When loading very small parts, Magics displays a default warning to ask whether you are using the correct measurement unit (inch-mm). Make sure to select the correct option to continue.

4.2. Managing Profiles

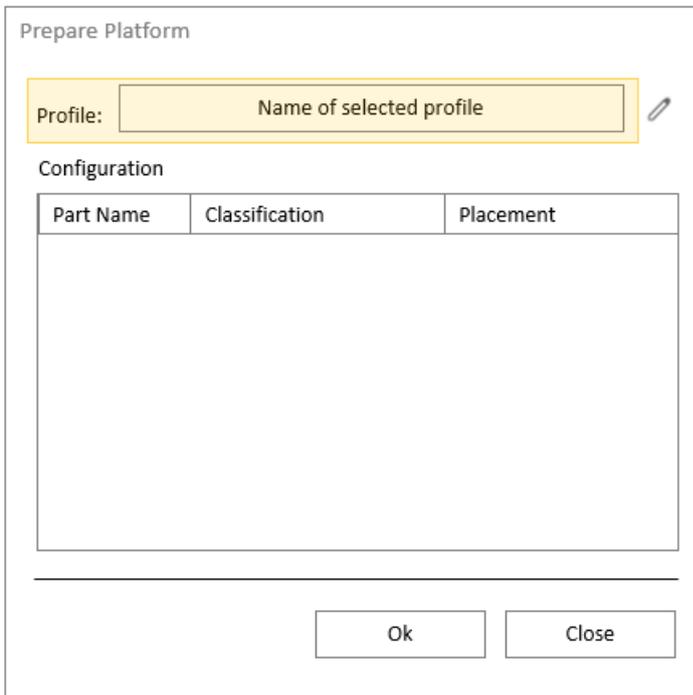
The Dental Module uses profiles to store your preferences for preparing the Dental Platform.

 *Profile Editor Parameters* on page 56

4.2.1 Select Profile

In Magics on ribbon **Plug-Ins** select **Prepare Platform** option.

Select profile from **Profile** drop-down list



Prepare Platform

Profile: 

Configuration

Part Name	Classification	Placement

Ok Close



The default profile cannot be altered.

A profile defines the following parameters:

- Part type & settings
- Label
- Placement
- Support types

 *Profile Editor Parameters* on page 56

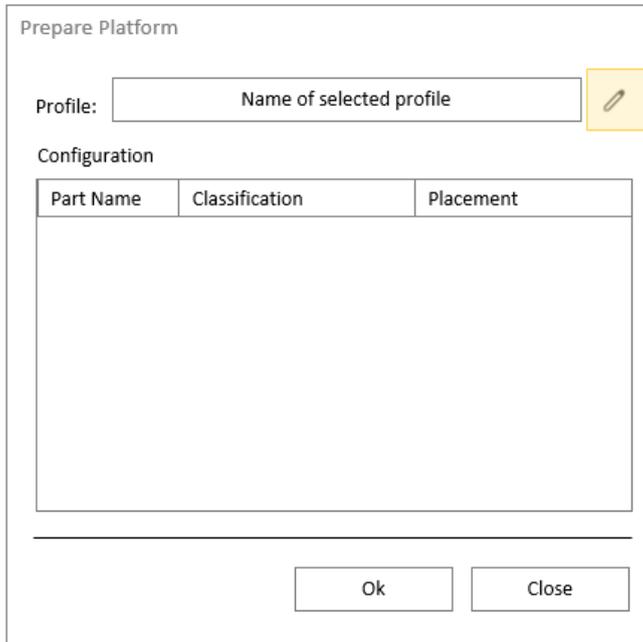
 *Classification of Part Types* on page 18

4.2.2 Add new Profile

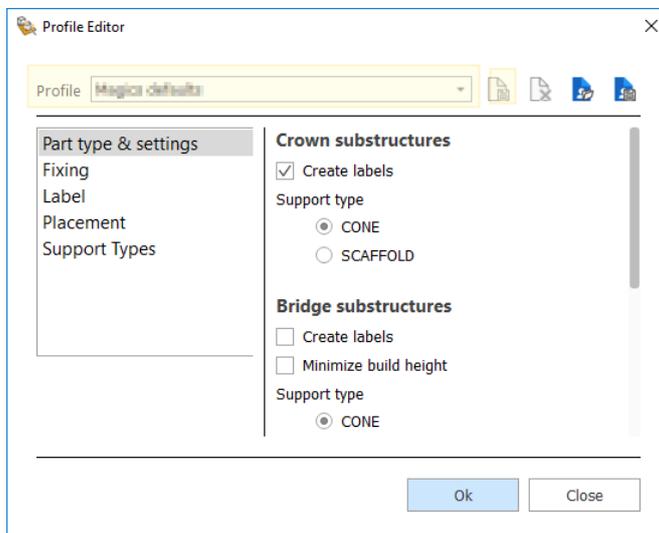
In Magics on ribbon **Plug-Ins** select **Prepare Platform** option.

To add a new profile you must modify an existing profile and then save it under a new name:

1. In **Prepare Platform** dialog click the pencil icon.



2. Edit the **Parameter Values**. An asterisk after the profile name shows that you made changes.



In the beginning only the default profile is available. If you edit the default profile you will be prompted to save it under a different name.

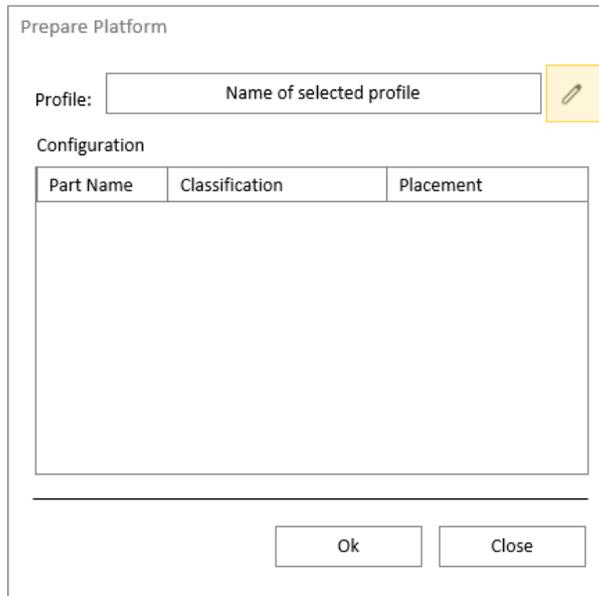
3. Click **Save** icon.
4. In the prompt, enter a new profile name and click **Ok**.

4.2.3 Edit Profile

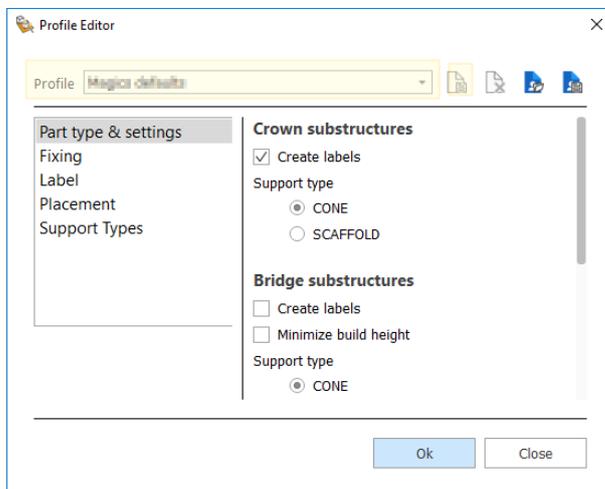
In Magics on ribbon **Plug-Ins** select **Prepare Platform** option.

To edit profile parameters:

1. In **Prepare Platform** dialog select existing profile from drop-down list and click the pencil icon.



2. Change parameters as necessary and click Save icon.



3. In prompt keep profile name and click **Ok**.



If you wish to rename an existing profile you need to change parameter values and click the Save icon. In the prompt you can change the profile name.

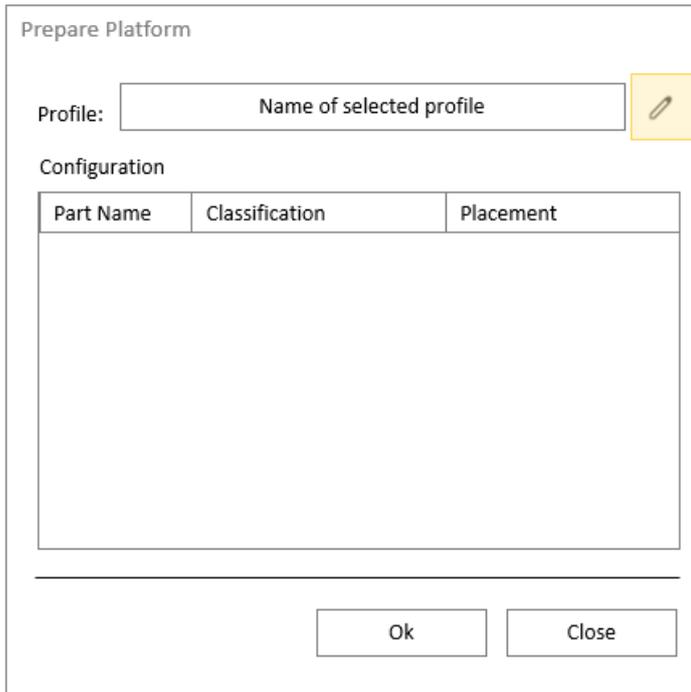
4.2.4 Delete Profile

In Magics on ribbon **Plug-Ins** select **Prepare Platform** option.

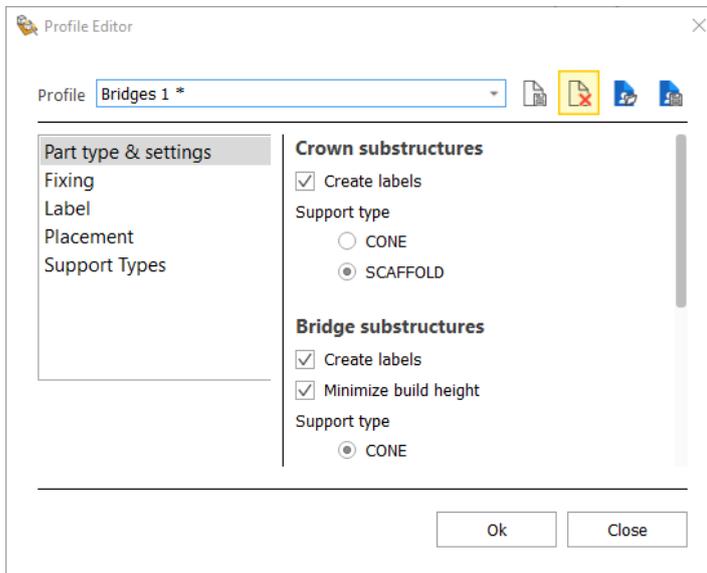


To delete a profile:

1. In **Prepare Platform** dialog select profile from drop-down list and click the pencil icon.



2. In **Profile Editor** click Delete icon.



3. In prompt click **Ok** to confirm deletion.



4.3. Classification of Part Types

In Magics on ribbon **Plug-Ins** select **Prepare Platform** option.

Prepare Platform

Profile:

Configuration

Part Name	Classification	Placement

Ok Close

For each part in the **Part Name** list the following **Classification** options are available:

- Automatic
- Crown
- Bridge
- Partial
- Processed part

The option **Automatic** is the default option for parts with no information present. With this option selected, parts are automatically classified as crown, bridge or partial.

You can also determine the part type directly by selecting the appropriate entry from the **Classification** drop-down list.

For parts that already have supports, the option **Processed part** is selected.



If **Processed part** is selected, no operations will be executed for this part, i.e. this part is not modified in any way but only positioned on the platform.



Placement Options for Parts on page 19

4.4. Placement Options for Parts

In Magics on ribbon **Plug-Ins** select **Prepare Platform** option.

Prepare Platform

Profile: 

Configuration

Part Name	Classification	Placement

For each part in the **Part Name** list the following **Placement** options are available:

- **Translation & Rotation** (default option):
Set this option to let the Dental Module find the optimal angle and position for the part on the platform.
- **Translation only:**
Dental Module will find the optimal position for the part without rotating it.
- **Fixed Position:**
If this option is selected Dental Module will not change your part's orientation or its position.



Use this option if you are sure that your part has already been optimally positioned and oriented.

If necessary, modify the profile parameters to adjust settings for your part type.

 [Profile Editor Parameters on page 56](#)

 [Start Platform Preparation on page 20](#)



4.5. Start Platform Preparation

In Magics on ribbon **Plug-Ins** select **Prepare Platform** option.

Prepare Platform

Profile: 

Configuration

Part Name	Classification	Placement

Press **Ok** to prepare the Dental Platform once all parameters are set correctly.

Press **Cancel** while the processes are still running to stop the Dental Module and return to the **Prepare Platform** dialog.

Press **Close** to exit the **Prepare Platform** dialog.



Once the Dental Platform has been prepared, you can execute any step in Magics before moving to the approval step.



Approve Platform on page 21

5. Approve Platform

The Dental Module performs many different operations automatically one after the other. The aim of the second step is to finalize the platform with all the parts so that it can be sent to the Build Processor afterwards. The BP will then create the job file for your machine.

To start the process:



Before approving the Dental Platform make sure you carried out all instructions correctly.

1. In Magics on ribbon **Plug-Ins** select **Approve Platform** option.



Once the approval process has started, all parts outside of the platform are removed from the scene. Only parts that are fully located on the platform can be approved.

2. Enable **Group parts** option as appropriate
 *Grouping Parts* on page 22
3. Define **Input** and **Output Folder**
 *Input and Output Folders* on page 23
4. Click **Start**.
5. When the Dental Platform has been approved successfully you can **Close** the dialog.



Approval Report on page 26



Build Platform on page 28

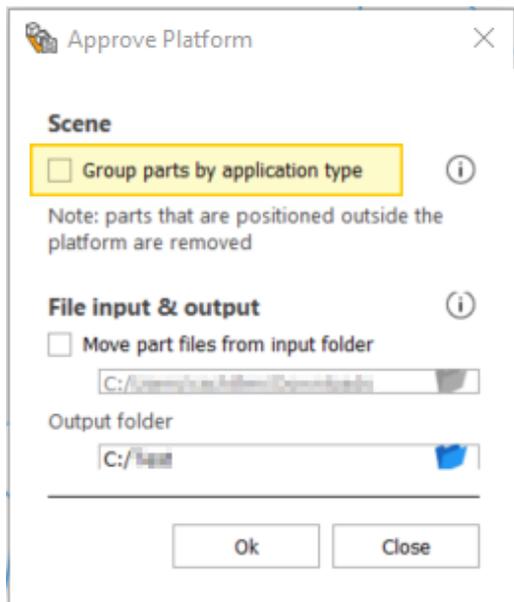
5.1. Grouping Parts

Each part has already received a classification of part type (crown, bridge, or partial) during the previous step of creating the Dental Platform. This has either been done automatically using the dental workflow or manually.

This classification of part type is valuable meta information for each part that can be used to group parts.

Later, it is much easier and faster to assign different build strategies to different groups within the Build Processor for optimal build results.

In Magics on ribbon **Plug-Ins** select **Approve Platform** option.



Enable the **Group parts by application type** option to allow the Dental Module to create one group per part type, depending on the parts you have loaded.



This option is enabled by default. It is advised to keep it enabled.

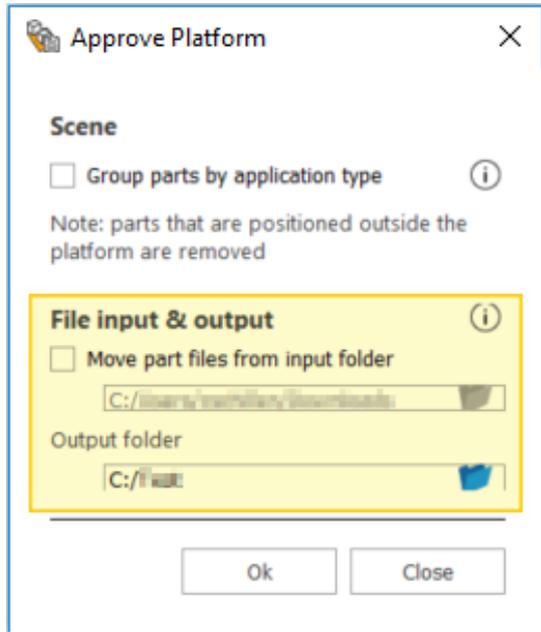


Not all Build Processors support part groups. Please refer to your Build Processor user manual for further information.

5.2. Input and Output Folders

For each platform approval process you need to specify an input and an output folder for part and processing data to be stored.

In Magics on ribbon **Plug-Ins** select **Approve Platform** option.



Input folder

Browse to the folder containing the imported part files.

Enable **Move part files from input folder** option to move part files of approved platform into the SourceData folder and delete them from the input folder.



This option is enabled by default as it is very useful to determine which parts from the input folder have already been processed and approved.

Output folder

Browse to the folder in which the process will create a subfolder with a current time stamp. The following data is stored in this subfolder:

- **SourceData** subfolder: Original part files of parts present on approved platform (if **Move part files from input folder** is enabled)
- Approval report
 - ⋮ *Approval Report* on page 26
- Platform.MATAMX file
- Images of platform in Magics (bottom-up, top-down views)



– Log files

 *Logging Functionality* on page 25



Each time a new approval process is started, a new subfolder with the current time stamp is created.



6. Logging and Reporting

Dental Module offers the following logging and reporting:

- Log files
- Approval report

6.1. Logging Functionality

The Dental Module has a logging functionality. When preparing or approving the dental platform the information about the running process stored in a log file that you can access later on.

When preparing or approving the dental platform a progress bar indicates the status of the process.

6.1.1 Log Files from Platform Preparation

You can find the log files from this step stored as text files in your personal AppData directory: ...\\Users\\your_username\\AppData\\Local\\Materialise\\DentalPlugin\\DentalEngineData\\out\\



The AppData directory is hidden by default. To access it you need to enable the **Hidden items** option on the **View** tab of your Windows Explorer.

The log files are stored in a time-stamped subfolder.



Each time a new dental workflow process is started, a new subfolder with the current time stamp is created.

6.1.2 Log Files from Platform Approval

After the approval process of the Dental Platform is complete, all data is stored in the **SourceData** subfolder of the output folder.



Input and Output Folders on page 23

The log files are stored in a time-stamped subfolder.



Each time a new dental workflow process is started, a new subfolder with the current time stamp is created.

6.2. Approval Report

After the approval process of the Dental Platform is complete, all data is stored in the **SourceData** subfolder of the output folder.

 *Input and Output Folders* on page 23

The approval report is stored in HTML format and can be displayed using any browser.

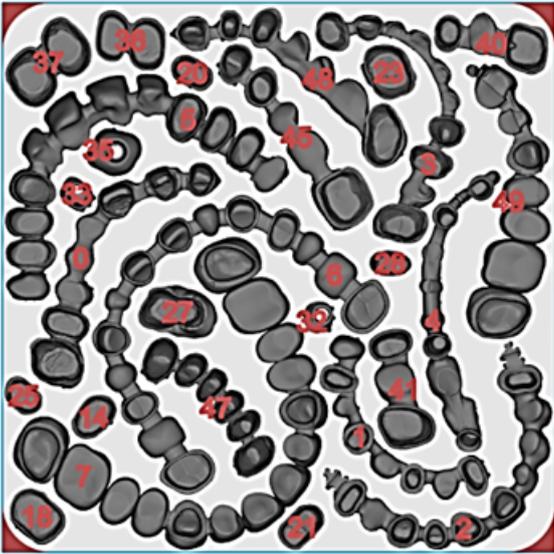
The following information is displayed in the approval report:

- Approval Date
- Machine
- Top view of the Dental Platform where each part has a unique number
- List of all approved parts showing Number, Part Name and Part Type
- Nesting density
- Count of tooth units for crowns and bridges

This is an example of an approval report:

Materialise Dental Module - Platform Overview

Approval date:	20210224-192525
Machine:	Materialise LM Machine
Number of objects (units):	27 (127)
Height:	21.230 mm
Dental Module Version:	0.57.1



Nesting density: 56.2 %

Number of nested units: 127

Number	Part Name	Part Type
0	bridge_cm_08u_8006_1	BRIDGE
1	bridge_cm_08u_8007_1	BRIDGE
2	bridge_cm_10u_A001_1	BRIDGE
3	bridge_cm_10u_8002_1	BRIDGE



As an additional visual aid the Dental Module saves two images of the created and approved dental platform in the output folder:

- platform-top_down.png
View of platform in Magics from the top where each part is allocated a unique number.
This image is also part of the approval report.
- platform-bottom_up.png
View of platform in Magics from the bottom, showing contact points of supports.

Furthermore, the platform from Magics is saved in a platform.MATAMX file for ease of access later on.

7. Build Platform

Once the Dental Platform has been created and approved, you will have a platform containing oriented and positioned parts, that have been supported. For each part type a group has been created containing the relevant parts. All parts outside of the platform have been removed from the workspace. The next step is to create a job file for the AM machine via the Build Processor.

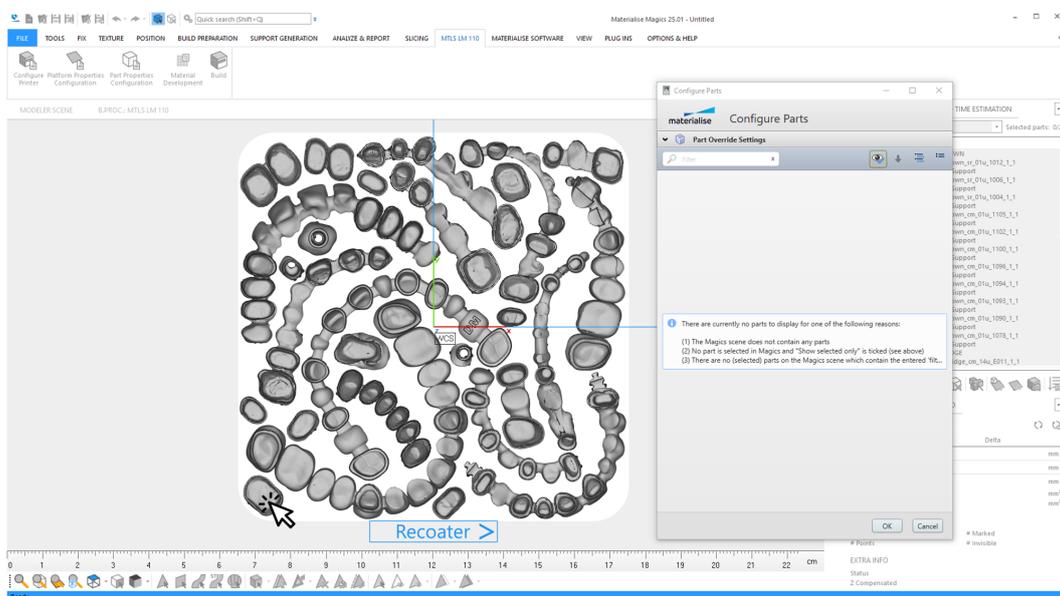


The following workflow shows how to work with a Build Processor that supports part grouping. Check your manual to determine if your Build Processor supports this functionality.

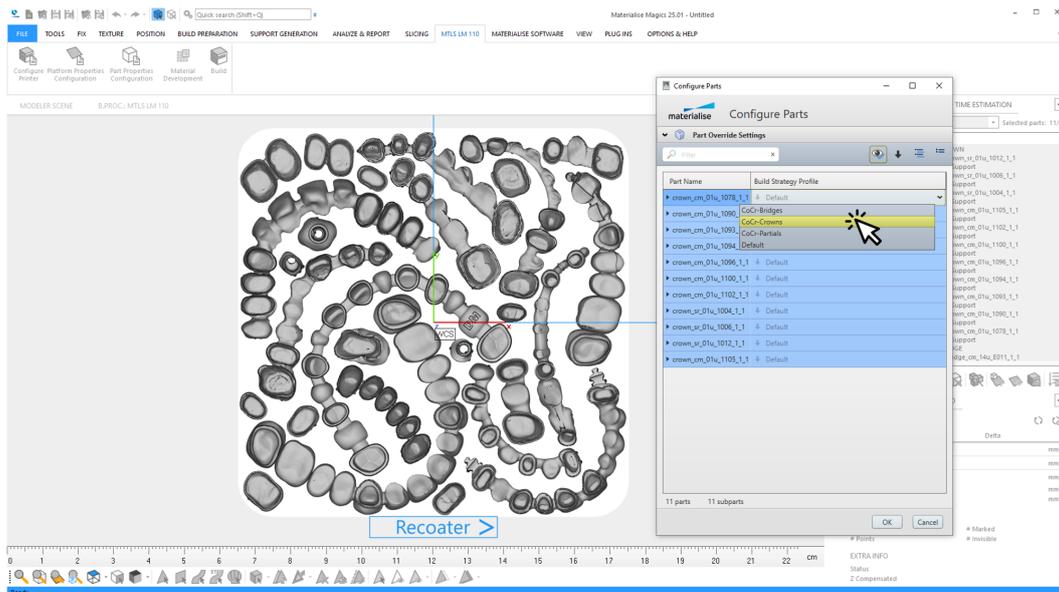
To proceed with building your Dental Platform using the Build Processor:

1. In Magics on ribbon **Machine Name** select **Part Properties Configuration** option.
2. In Magics, select a dental part, e.g. of type "Bridge":

The Build Processor now displays all dental parts contained in the group "Bridge".

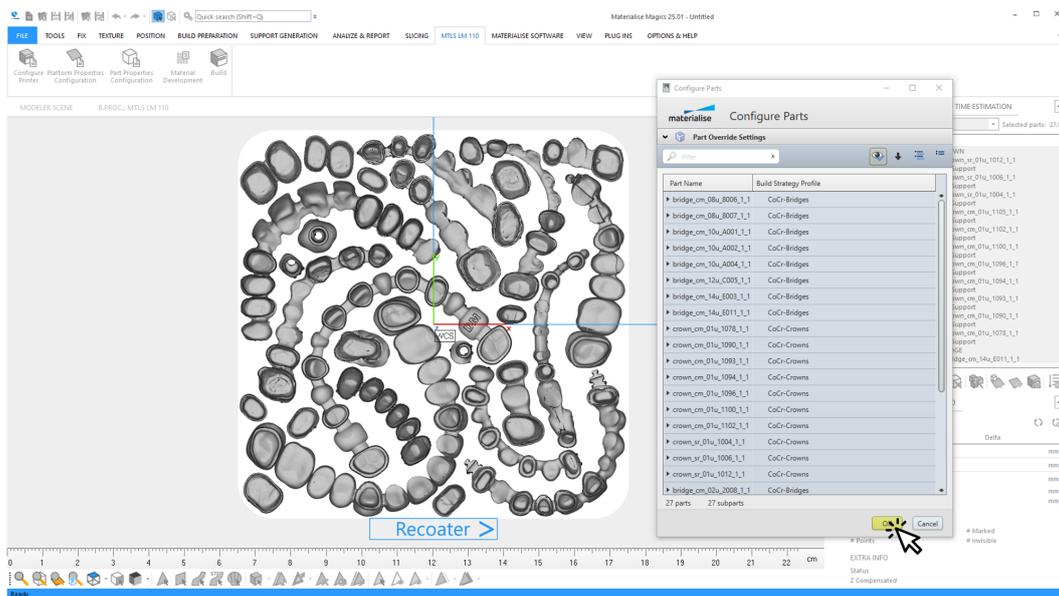


3. Select a **Build Strategy** from the drop-down list.

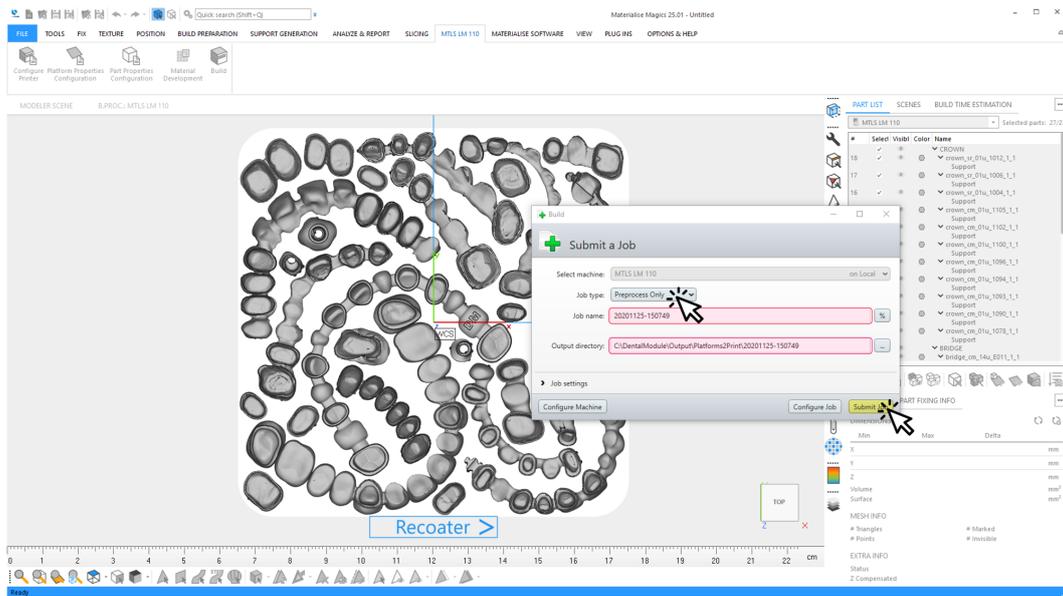


This build strategy is then applied to all parts in this group.

4. Continue this for all other groups, i.e. "Crowns" and "Partials".
5. In Magics, select all parts on the platform. The **Configure Parts** dialog shows all parts of the platform. Click **OK** to finalize the data.



6. In Magics, on ribbon **Machine Name** select **Build** option. The **Submit a Job** dialog opens.



- Job type: Select the Preprocess only option.
- Job name: The job name you enter should be the same name as the saved Dental Platform.
- Output directory: This is the path where the final buildjob file will be saved. It should be the same as your output folder.

☰ 5.2 Input and Output Folders on page 23

7. Click **Submit Job**.



8. Frequently Asked Questions

This section addresses the frequently asked questions concerning the efficient usage of the Dental Module. Select from the list below:

8.1. Use of the Dental Module	32
8.1.1 “Prepare Platform” Dialog	32
8.1.2 “Approve Platform” Dialog	33
8.2. Parameter Settings	34
8.2.1 Parameter Profiles	34
8.2.2 Part Alignment	35
8.2.3 Part Classification	35
8.2.4 Part Placement	36
8.2.5 Part Labels	38
8.2.6 Support Type - Cones	38
8.2.7 Support Type - Scaffold	40
8.2.8 Dental Platform	43
8.2.9 Dental Application “Crown”	44
8.2.10 Dental Application “Bridge”	46
8.2.11 Dental Application “Partials”	48
8.3. Unexpected Results	49
8.3.1 Part Placement on Platform	49
8.3.2 Part Labels	50
8.3.3 Part Orientation	50
8.3.4 Approve Platform	50
8.4. Warnings and Errors	51
8.5. How to add more parts to an existing Dental Platform	53
8.6. How to print parts that were not automatically prepared	53
8.7. How to add new parts to an existing part group that has scaffold supports	53
8.8. How to assign classification and placement options to a group of parts	54
8.9. How to delete single cone supports	55

8.1. Use of the Dental Module

Materialise Magics Dental Module 1.0 is a new product from Materialise and automates 3D print data preparation for dental applications.

8.1.1 “Prepare Platform” Dialog

8.1.1.1 What does “Prepare Platform” do?

This function automatically creates a fully prepared dental platform for a given set of dental parts based on a selected parameter profile without further user interaction, with all parts repaired, aligned, labeled, supported, and arranged on the platform.

The part preparation is specifically tailored to the various application classes and can differ greatly from one another.

For this reason, the dental module classifies the transferred parts.

- The user can specify the class of a part.

The automatic part preparation and platform generation can be influenced by parameters that are stored in profiles.

- The user can influence the placement of a part on the platform via placement options.

8.1.1.2 How can I call the dialog?

Click the "Prepare Platform" button in the "Plugins" ribbon in Magics.

8.1.1.3 What can I do in the dialog?

- Select of a parameter profile.
- Create, modify, and delete parameter profiles.
- Part-specific selection of options

8.1.1.4 How can I select a profile?

- Click on the profile name in the "Prepare Platform" dialog to display a drop-down list.
- Click on the desired profile to apply the selection.

8.1.1.5 How can I create, delete, rename, or modify a profile?

Click the "Edit" button to open the parameter editor:

- Click the "Save" button to save changes to the parameter values of the selected profile.
- Click the "Delete" button to delete the selected profile.
- Click the "Rename" button to change the name of the profile.
- Click on a profile name to display and change its parameter.

8.1.1.6 How can I import / export profiles?

This function is not (yet) available in the dental module.

8.1.1.7 How can I start the automatic platform generation?

Click the "Start" button to start the automatic platform generation.



8.1.1.8 How can I cancel the platform generation?

Click on the "Stop" button to cancel a running platform generation.

8.1.2 “Approve Platform” Dialog

8.1.2.1 What does “Approve Platform” do?

This function bundles various activities that help the user with archiving, build job generation and part to order assignment.

This function is optional and does not have to be executed by the user.

- In a first step, all dental parts in the scene are checked to see if they are completely on the platform. All parts for which this is not the case are removed from the scene.
- In a second step, all parts are grouped into type classes. In the build processor, the user selected build strategy for a part is applied to all parts of the same type. This step is only performed if this option is selected by the user.
- In a third step, the platform with the prepared parts is saved in a platform file in an output directory specified by the user.
- In a fourth step, the original data of the remaining parts are moved from their original location to a separate subfolder. This prevents their unintended use in further platform creations. This step is only performed if this option is selected by the user.
- In a fifth step, an Approval Report is created. In the report, there is a top view of the dental platform in which all components have been assigned a number. A table lists the associated file name for each number. This is to facilitate the assignment of the components to the orders.

8.1.2.2 How can I call the dialog?

Click the "Approve Platform" button in the "Plugins" ribbon.

8.1.2.3 What can I do in the dialog?

Enable or disable the option "Grouping by part type".

Enable or disable the option "Move parts from source folder".

- Enter path to a folder which contains the original data.

Enter path to an output folder.

8.1.2.4 How can I start the platform approval?

Click the "Start" button to start the approval operation.

8.1.2.5 How can I cancel the platform approval?

Click the "Cancel" button to cancel the approval operation.



8.2. Parameter Settings

8.2.1 Parameter Profiles

8.2.1.1 What are parameter profiles?

The parameter profiles of the dental module define the exact procedure for the automatic generation of dental platforms.

The parameters influence the result - e.g. the distance of the parts to each other on the platform, the support type used, whether labels are applied or not, etc.

A parameter profile saves all settings for the supported dental types "Crowns", "Bridges" and "Partials" in a single profile at the same time.

8.2.1.2 How do I select a profile?

- Click on the profile name in the "Prepare Platform" dialog to display a drop-down list.
- Click on the desired profile to apply the selection

8.2.1.3 How can I import/export profiles?

This function is not (yet) available in the dental module.

8.2.1.4 How can I create, delete, rename, or modify a profile?

Click the "Edit" button to open the parameter editor:

- Click the "Save" button to save changes to the parameter values of the selected profile.
- Click the "Delete" button to delete the selected profile.
- Click the "Rename" button to change the name of the profile.
- Click on a profile name to display and change its parameter.

8.2.1.5 What are the parameters for crowns?

There are two parameters for the application type "Crown":

1. Activation / deactivation of the automatic generation of labels.
2. Specification of the support type: cone support or framework support.

8.2.1.6 What are the parameters for bridges?

There are three parameters for the application type "Bridge":

1. Activation / deactivation of automatic generation of labels.
2. Automatic minimization of the height of slanted bridges.
3. Specification of the support type: cone support or framework support.?

8.2.1.7 What are the parameters for partials?

There are three parameters for the application type "Partial":

1. Orientation of the lingual/palatal side upwards (pointing away from the platform) or downwards (pointing towards the platform).
2. Angle of inclination:

- A positive angle tilts the anterior region upward (in the build direction).
- A negative angle inclines the anterior region downward (toward the platform)

3. Specification of the support type: cone support or framework support.

8.2.2 Part Alignment

8.2.2.1 How do I keep a given alignment of a part?

This function is not (yet) available in the dental module.

8.2.3 Part Classification

8.2.3.1 Why are there part classes?

Automated data processing is customized for each dental application class such as crowns, bridges, and partials.

To apply the correct processing for a dental part, its application class must be determined beforehand.

8.2.3.2 Which part classes are supported by the Dental Module?

There are the part classes "crown", "bridge" and "partial".

In addition to the application classes, there are two further "classes":

- "-Automatic-":

If this "class" is selected, the application class of the part is automatically determined when the dental platform is generated.

This option is the default selection for all parts unless there is information about the determined application class of the part.

- "Processed Parts":

This class is assigned only by the dental module.

It is used if no information about the determined application class is available for a part, but the part has supports.

"Processed Parts" are placed on the platform by the dental module without any further changes to the part.

8.2.3.3 How do I manually assign a part class to a part?

- Click on the table entry of a part class to display a drop-down list.
- Click on the desired part class to apply the selection.

8.2.3.4 How do I sort the table by part name?

- Click on the table element "Part Name".
- A small arrow indicates whether sorting is from A-Z (arrow down) or from Z-A (arrow up).

8.2.3.5 How do I sort the table by part classes?

- Click on the table element "Classification".
- A small arrow indicates whether sorting is from A-Z (arrow down) or from Z-A (arrow up).



8.2.3.6 How do I make a multiple selection of parts?

- Multiple selection of a contiguous series of parts:
 - Select the first part by clicking on the part name.
 - Select the connected row by "shift-clicking" on the part name in another row.
- Multiple selection of individual table rows:
 - Select the first part by clicking on the part name.
 - Select further parts by "Ctrl-click" on their part name in other rows.

8.2.3.7 How do I assign a part class to multiple parts at once?

- First select multiple parts that should get the same placement option.
- Click on the class of one of the selected parts to display a drop-down list.
- Click on the desired part class to apply the selection to all previously selected parts.

8.2.4 Part Placement

8.2.4.1 Why are there placement options?

The placement options allow the user to specifically influence how a part is placed on the platform.

8.2.4.2 What are the placement options?

- "Translation and Rotation"
 - The part can be moved and rotated on the platform as desired.
 - This is the default option for all parts.
- "Translation only"
 - The part may only be moved on the platform.
 - The given orientation of the part will not be changed.
- "Fixed Position"
 - The given position and orientation of the part will not be changed.

8.2.4.3 How do I manually assign a placement option to a part?

- Click on the table entry of a part placement to display a selection list.
- Click on the desired placement option to apply the selection.
- Click on the table element "Part Name".
- A small arrow indicates whether sorting is from A-Z (arrow down) or from Z-A (arrow up).

8.2.4.4 How do I sort the table by part name?

8.2.4.5 How do I sort the table by part classes?

- Click on the table element "Classification".
- A small arrow indicates whether sorting is from A-Z (arrow down) or from Z-A (arrow up).

8.2.4.6 How do I make a multiple selection of parts?

- Multiple selection of a contiguous series of parts:
 - Selection of the first part by clicking on the part name.
 - Selection of the connected row by "shift-clicking" on the part name of another part.
- Multiple selection of individual table rows:
 - Selection of the first part by clicking on the part name.
 - Selection of further parts by "Ctrl-click" on their part name.

8.2.4.7 How do I assign a placement option to multiple parts at once?

- First select multiple parts that should get the same placement option.
- Click on the placement option of one of the selected parts to display a drop-down list.
- Click on the desired part class to apply the selection to all previously selected parts.

8.2.4.8 How do I change the distance between the parts on the platform?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to displays its parameters.
- Adjust the "Placement/Part interval" parameter to the desired distance.
- Click the "OK" button to apply the modified value.

8.2.4.9 How do I change the distance of the parts to the platform border?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to displays its parameters.
- Adjust the "Placement/Platform margin" parameter to the desired distance.
- Click the "OK" button to apply the modified value.

8.2.4.10 How do I change the distance of the parts to the platform (part height)?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to displays its parameters.
- Adjust the "Placement/Default z-height" parameter of the application class to the desired distance.
- Click the "OK" button to apply the modified value.

8.2.4.11 How do I create / do not create part labels?

Click on the "Edit" button to open the profile editor.

8.2.5 Part Labels

- Click on the name of the profile to be adjusted to displays its parameters.
- Enable the option(s) "Part type & settings/Crowns/Create Labels" and/or "Part type & settings/Bridge/Create Labels" if a label should be created for the part and disable the option if no label should be created.
- Click the „OK“ button to apply the changed setting.

8.2.5.1 How do I align part labels in re-coater direction?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to displays its parameters.
- Enable the option "Label/Directed labels".
- Click the „OK“ button to apply the changed setting.

8.2.5.2 How do I create / do not create supports for part labels?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to displays its parameters.
- Enable the option "Support Types/Add supports for labels" if supports should be created for the labels and disable the option if no supports should be created.
- Click the „OK“ button to apply the changed setting.

8.2.5.3 How do I adjust the content of a label?

This function is not (yet) available in the dental module.

8.2.5.4 How do I adjust the size of a label??

This function is not (yet) available in the dental module.

8.2.5.5 How do I adjust the connection of a label to the part?

This function is not (yet) available in the dental module.

8.2.6 Support Type - Cones

8.2.6.1 What are cone supports?

The cone support is a type of support that allows a very stable connection of parts to the platform.

The stability is achieved by a truncated cone design:

- The wide base surface allows a firm connection of the support to the platform.
- The narrower top surface allows a connection with sufficient strength with easy removability.
- The truncated cone connects both surfaces and provides one with good stability.

However, long cone supports with very small top area become very thin in the upper area, which negatively affects the stability.

- A design consisting of two truncated cones placed on top of each other prevents this:
 - The upper cone forms the tip of the support design and connects the support to the part.
 - The lower cone forms the base of the support design and ensures a stable connection to the platform.
 - The size of the bottom of the tip corresponds to the size of the top of the base.

8.2.6.2 How do I assign the support type "Cone support" to a part type?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Set the parameters "Part type & settings/Support Type" for crowns, bridges and/or partials to the support type "Cone".
- Click the „OK“ button to apply the changed setting.

8.2.6.3 How do I adjust the geometry of the cone supports?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameters for the cone supports under "Support Types/Cones".
- Click the „OK“ button to apply the changed setting.

8.2.6.4 How do I adjust the contact size to the part?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Cones/Contact part radius".
- Click the „OK“ button to apply the changed setting.

8.2.6.5 How do I adjust the tip of the cone support?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Cones/Tip height".
- Adjust the parameter "Support Types/Cones/Tip base radius".
- Click the „OK“ button to apply the changed setting.

8.2.6.6 How do I adjust the contact size to the platform?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Cones/Contact platform radius".
- Click the „OK“ button to apply the changed setting.

8.2.6.7 How do I adjust the density of the cone supports?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Cones/Minimum distance between cones".
- Click the „OK“ button to apply the changed setting.

8.2.6.8 How do I increase/decrease the surface area for cone supports?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Cones/Self-supporting angle".
- Click the „OK“ button to apply the changed setting.

8.2.6.9 How do I avoid cone supports at the margin lines of crowns and bridges?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Distance to margin line".
- Click the „OK“ button to apply the changed setting.

8.2.6.10 How do I create individually parameterized tapered supports for each part type?

This function is not (yet) available in the dental module.

8.2.6.11 How do I add individual cone supports to a part manually?

Please refer to your Magics user manual for further information on manual support generation.

8.2.6.12 How do I adjust the geometry of manually added cone supports?

Please refer to your Magics user manual for further information on manual support generation.

8.2.7 Support Type - Scaffold

8.2.7.1 What is a scaffold support?

A scaffold support is a type of support for optimal component support without entrapment of metal powder with easy removability.

A framework support consists of a grid-like framework structure that is connected to the platform surface.

The surfaces of the components to be supported are connected to the intersection points of the lattice-like framework structure by means of struts.

- The number of struts converging at a crossing point depends on the lattice spacing, which is determined by the rhombus width.
 - The greater the rhombus width, the more connecting struts converge at the crossing points.

The struts are connected to the surface of the component to be supported by means of three different types of contact points:

- Connection of local extrema by means of anchor contact points. These should be connected in a stable manner to be able to absorb greater loads.
- Connection of border areas by means of border contact points. These should be tightly and finely bonded to increase the surface quality at component edges.
- Connection of inner areas by means of inner contact points.

8.2.7.2 How do I assign the support type "Scaffold Support" to a part type?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Set the parameters "Part type & settings/Support Type" for crowns, bridges and/or model casts to the support type "Scaffold".
- Click the „OK“ button to apply the changed setting.

8.2.7.3 How do I adjust the geometry of the scaffold supports?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameters for the scaffold supports under "Support Types/Scaffold Support".
- Click the „OK“ button to apply the changed setting.

8.2.7.4 How do I change the width of the grid structure?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Scaffold Support/Grid/Diamond width".
- Click the „OK“ button to apply the changed setting.

8.2.7.5 How do I change the thickness of the grid struts?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Scaffold Support/Grid/Edge width".
- Click the „OK“ button to apply the changed setting.

8.2.7.6 How do I change the thickness of the connection struts?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Scaffold Support/Top Connection/Connection width".
- Click the „OK“ button to apply the changed setting.

8.2.7.7 How do I change the thickness of the contact joint of a connecting strut with the part?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Scaffold Support/Top Connection/Contact width".
- Click the „OK“ button to apply the changed setting.

8.2.7.8 How far does the scaffold support protrude beyond a part?

The scaffold support protrudes beyond the part by approx. half the width of the diamond.

The distance to the platform edge should be set to at least half of the diamond width.

- A smaller distance can have a negative effect on the support performance of the scaffold support.

8.2.7.9 How do I increase/decrease the surface area for scaffold supports?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Scaffold Support/Point Distribution/Minimum self-support angle".
- Click the „OK“ button to apply the changed setting.

8.2.7.10 How do I avoid scaffold supports at the margin lines of crowns and bridges?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Support Types/Distance to margin line".
- Click the „OK“ button to apply the changed setting.

8.2.7.11 How do I create individually parameterized scaffold supports for each part type?

This function is not (yet) available in the dental module.

8.2.7.12 How do I create a weaker/stronger support connection to the part?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Decrease/increase the parameter value "Support Types/Scaffold Support/Top Connection/Connection width".
- Decrease/increase the parameter value "Support Types/Scaffold Support/Top Connection/Contact width".
- Click the „OK“ button to apply the changed settings.

8.2.7.13 How do I achieve a weaker/stronger grid structure?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Decrease/increase the parameter value "Support Types/Scaffold Support/Grid/Edge width".
- If applicable, decrease/increase the parameter value "Support Types/Scaffold Support/Grid/Diamond width".
- Click the „OK“ button to apply the changed settings.

8.2.7.14 Why is the scaffold support assigned to only one part?

- The scaffold support connects the parts to the platform surface via a single grid structure.
- For this reason, the scaffold support cannot be divided among the different parts.
- Because of this, the scaffold support is assigned to only one of the parts that have received the scaffold support.

8.2.7.15 How can I edit a generated scaffold support manually?

This function is not (yet) available in the dental module.

8.2.7.16 How do I add additional parts to an existing platform with scaffold support?

- Delete the existing scaffold support in Magics.
- Import the additional parts to the scene.
- Have the scaffold support regenerated for all parts via the "Prepare Platform".

8.2.8 Dental Platform

8.2.8.1 How do I distribute the parts across multiple platforms?

This function is not (yet) available in the dental module.

8.2.8.2 How do I move prepared parts on the platform?

- Select one or more parts in Magics.
- Press the "Ctrl T" key combination.
- Move the part(s).
- Press "OK" button in the move dialog.

8.2.8.3 How do I create supports even for surplus parts?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Enable the option "Support Types/Add supports to labels".
- Click the „OK“ button to apply the changed setting.

8.2.8.4 How do I add further parts to a platform that has not been fully filled by the dental module (e.g., due to too few imported parts)?

- Import additional parts to the scene in Magics.
- Click the "Prepare Platform" button in the "Plugins" ribbon.
- Select a profile.
- Adjust the placement options (if necessary):
 - All parts whose placement options have been adjusted by the user for the first iteration must be set to the same placement options in subsequent iterations.
 - Any existing scaffold support should be deleted in Magics beforehand.
 - For parts with directed labels, their placement options must be set to "Translation only" to preserve the alignment of the labels.
- Click the "Start" button to start the automatic platform generation.

8.2.8.5 How do I change the distance between the parts on the platform?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Placement/Part interval".
- Click the „OK“ button to apply the changed setting.

8.2.8.6 How do I change the distance of the parts to the platform border?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Placement/Platform margin".
- Click the „OK“ button to apply the changed setting.

8.2.8.7 How do I change the distance of the parts to the platform surface (part z-height)?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameters in "Placement/Default z-height".
- Click the „OK“ button to apply the changed settings.

8.2.9 Dental Application “Crown”

8.2.9.1 How are crowns processed automatically?

If a part has been classified as a crown, it is processed as follows:

- Fixing of mesh defects.
- Orienting of the occlusal surface downward.
- Applying a label (optional).

- Generating support structures.
- Placing on build platform.

8.2.9.2 How do I change the distance between the crowns on the platform?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Placement/Part interval".
- Click the „OK“ button to apply the changed setting.

8.2.9.3 How do I change the distance of the crowns to the platform border?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Placement/Platform margin".
- Click the „OK“ button to apply the changed setting.

8.2.9.4 How do I change the distance of a crown to the platform surface (part z-height)?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Placement/Default z-height/Crowns".
- Click the „OK“ button to apply the changed setting.

8.2.9.5 How do I create cone supports for crowns?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Set the parameter "Part type & settings/Crowns/Support type" to the support type "Cone".
- Click the „OK“ button to apply the changed setting.

8.2.9.6 How do I create scaffold support for crowns?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Set the parameter "Part type & settings/Crowns/Support type" to the support type "Scaffold".
- Click the „OK“ button to apply the changed setting.

8.2.9.7 How do I create part labels for crowns?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.

- Enable the option "Part type & settings/Crowns/Create Labels".
- Click the „OK“ button to apply the changed setting.

8.2.9.8 How do I align part labels in re-coater direction?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to displays its parameters.
- Enable the option "Label/Directed labels".
- Click the „OK“ button to apply the changed setting.

8.2.9.9 How do I create / do not create supports for part labels?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to displays its parameters.
- Enable the option "Support Types/Add supports for labels" if supports should be created for the labels and disable the option if no supports should be created.
- Click the „OK“ button to apply the changed setting.

8.2.9.10 What does a red-colored crown next to the platform mean?

- The fixing of a crown could not be performed with sufficient quality for error-free automated further processing.
- The crown was therefore excluded from placement on the platform and placed outside.

8.2.9.11 What does an orange-colored crown next to the platform mean?

- The occlusal surface of the crown could not be determined with sufficient certainty.
- The crown was therefore excluded from placement on the platform and placed outside.

8.2.10 Dental Application “Bridge”

8.2.10.1 How are bridges processed automatically?

If a part has been classified as a bridge, it is processed as follows:

- Fixing of mesh defects.
- Orienting of the occlusal surface downward.
- Minimizing height (optional).
- Applying a label (optional).
- Generating support structures.
- Placing on build platform.

8.2.10.2 How do I change the distance between the bridges on the platform?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.

- Adjust the parameter "Placement/Part interval".
- Click the „OK“ button to apply the changed setting.

8.2.10.3 How do I change the distance of the bridges to the platform border?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Placement/Platform margin".
- Click the „OK“ button to apply the changed setting.

8.2.10.4 How do I change the distance of a bridge to the platform surface (part z-height)?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Placement/Default z-height/Bridges".
- Click the „OK“ button to apply the changed setting.

8.2.10.5 How do I create cone supports for bridges?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Set the parameter "Part type & settings/Bridges/Support type" to the support type "Cone".
- Click the „OK“ button to apply the changed setting.

8.2.10.6 How do I create scaffold support for bridges?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Set the parameter "Part type & settings/Bridges/Support type" to the support type "Scaffold".
- Click the „OK“ button to apply the changed setting.

8.2.10.7 How do I create part labels for bridges?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Enable the option "Part type & settings/Bridges/Create Labels".
- Click the „OK“ button to apply the changed setting.

8.2.10.8 How do I align part labels in re-coater direction?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to displays its parameters.

- Enable the option "Label/Directed labels".
- Click the „OK“ button to apply the changed setting.

8.2.10.9 How do I create / do not create supports for part labels?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to displays its parameters.
- Enable the option "Support Types/Add supports for labels" if supports should be created for the labels and disable the option if no supports should be created.
- Click the „OK“ button to apply the changed setting.

8.2.10.10 What does a red-colored bridge next to the platform mean?

- The fixing of a bridge could not be performed with sufficient quality for error-free automated further processing.
- The bridge was therefore excluded from placement on the platform and placed outside.

8.2.10.11 What does an orange-colored bridge next to the platform mean?

- The occlusal surface of the bridge could not be determined with sufficient certainty.
- The bridge was therefore excluded from placement on the platform and placed outside.

8.2.11 Dental Application “Partials”

8.2.11.1 How are partials processed automatically?

If a part has been classified as a partial, it is processed as follows:

- Fixing of mesh defects.
- Minimizing the build height.
- Alignment of the lingual/palate areas.
- Tilting up/down the anterior region.
- Generating support structures.
- Placing on build platform.

8.2.11.2 How do I change the distance between the partials on the platform?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Placement/Part interval".
- Click the „OK“ button to apply the changed setting.

8.2.11.3 How do I change the distance of the partials to the platform border?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.

- Adjust the parameter "Placement/Platform margin".
- Click the „OK“ button to apply the changed setting.

8.2.11.4 How do I change the distance of a partial to the platform surface (part z-height)?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Adjust the parameter "Placement/Default z-height/Partials".
- Click the „OK“ button to apply the changed setting.

8.2.11.5 How do I create cone supports for Partials?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Set the parameter "Part type & settings/Partials/Support type" to the support type "Cone".
- Click the „OK“ button to apply the changed setting.

8.2.11.6 How do I create scaffold support for partials?

- Click on the "Edit" button to open the profile editor.
- Click on the name of the profile to be adjusted to display its parameters.
- Set the parameter "Part type & settings/Partials/Support type" to the support type "Scaffold".
- Click the „OK“ button to apply the changed setting.

8.2.11.7 What does a red-colored partial next to the platform mean?

- The fixing of a partial could not be performed with sufficient quality for error-free automated further processing.
- The partial was therefore excluded from placement on the platform and placed outside.

8.3. Unexpected Results

8.3.1 Part Placement on Platform

8.3.1.1 Parts are placed beyond the platform.

The error occurs on rectangular platforms with rounded corners.

- Here, the corners up to the rounding of the build platform were not correctly defined as no-build zones in the machine configuration of the build processor.
- Solution: Request a correctly configured machine configuration from the machine manufacturer or Materialise.

8.3.1.2 The part was placed outside the platform with the color "Orange".

The part could not be aligned correctly:

- Crowns/Bridges: The position of the occlusal surface could not be determined correctly.
- Solution: Manual orientation and support generation in Magics before transfer to dental module.

8.3.1.3 The part was placed outside the platform with the color "Red".

The part could not be repaired in such a way that further data preparation could be performed without errors.

- Solution: Manual repair in Magics before transfer to the dental module.

8.3.2 Part Labels

8.3.2.1 The orientation of the labels is not in the re-coating direction.

In the profile, the parameter "Directed labels" is disabled.

- Solution: Enable the option "Directed labels".

The re-coating direction is not or incorrectly defined in the "Machine Properties".

- Solution: Define the re-coating direction in the "Machine Properties".

For successive passes of "Prepare Platform", the placement option for parts that have already received directed labels in previous passes must be set to the "Translate only" option to prevent rotation of these parts.

8.3.3 Part Orientation

8.3.3.1 The orientation of a part is different than expected.

The type of a part was classified wrong and thus processed with the data formatting of the wrong application type (alignment, selected support type, ...):

- Solution: In the "Prepare Platform" dialog, manually select the correct part type in the Classification column.

8.3.3.2 The part was placed outside the platform with the color "Orange".

The geometry of the part deviates from the expected standard and cannot be processed correctly by the automatic system.

- Solution: Transfer to the dental module as fully prepared data in Magics (repair, alignment, support).

8.3.4 Approve Platform

8.3.4.1 The generated platform shows an incorrect part assembly.

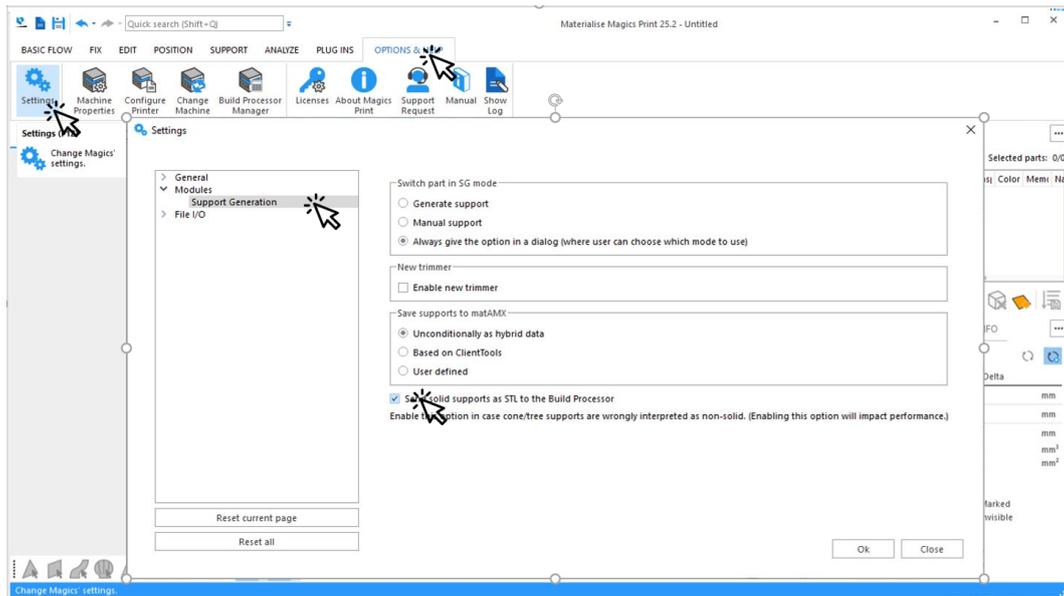


For **Magics Print** users only: In order for the Dental Module to work correctly you must disable the **Send solid supports as STL to the Build Processor** option.

To do this:

1. In Magics Print, go to **Options & Help** ribbon and select **Settings**.
2. In **Modules** options select **Support Generation**.

3. Disable the **Send solid supports as STL to the Build Processor** option.



4. Click **Ok** to Save.

8.4. Warnings and Errors

8.4.0.1 The error "Magics v25.01 needed" is shown.

The version of the used Magics is not compatible:

- Magics RP: Version must be 25.01 or higher!
- Magics Print: Version must be 25.2 or higher!

8.4.0.2 The error "Please select a machine to prepare" is shown.

In Magics, a machine must be selected before using the dental module.

- Magics RP:
 - Click the "New Scene" button in the "Build Preparation" ribbon in Magics RP.
 - Select a machine.
- Magics Print:
 - Click the "Change Machine" button in the "Options & Help" ribbon in Magics Print.
 - Select a machine.

8.4.0.3 The error "No Platform" is shown.

The build envelope was not defined correctly/completely in the machine properties:

- Under "General info", the information for the "Build envelope" must be complete.
 - Platform shape
 - Size
 - Position

Under Default Parts the option "Enable no-build zones" must be selected.



8.4.0.4 The error "No Recoater direction" is shown.

The re-coater direction was not defined correctly/completely in the machine properties:

Under "General info", the information for the re-coater direction in "Configuration" must be complete:

- Axis
- Direction.

8.5. How to add more parts to an existing Dental Platform

Question:

What should I do in case I have remaining space on the dental platform?

Answer:

If you cannot fill the remaining space with parts that have already been imported and processed, you need to import additional dental parts.

To add additional parts to an existing Dental Platform:

1. Import parts using Magics.
2. Click **Prepare Platform**.



For parts that are already on the platform, the classification from the previous iteration is shown.

3. Click **Start** to generate the new dental platform with the newly-added parts.

8.6. How to print parts that were not automatically prepared

Question:

How can I print parts that are not supported by the automatic data preparation feature of the Dental Module?

Answer:

After creating a scene, import the parts that have no automatic data preparation support and process them manually by using Magics tools (Fixing, Orientation, Support Generation).

After these parts are fixed and placed onto the platform with the correct orientation, you can import additional parts that have automatic data preparation support.



If you wish to have specific placement constraints for a part, make sure to select the appropriate **Placement** option.

Once you are done importing, click **Prepare Platform**.

You can use the default settings for the rest of the parts.

When you are ready, click **Start** to create the actual dental platform.

8.7. How to add new parts to an existing part group that has scaffold supports

Question:

Can I add new parts to an existing part group with scaffold supports?



Answer:

Yes, you can. There are two possible scenarios:

1. One or more new parts are to receive scaffold support
2. None of the new parts are to receive scaffold support

One or more new parts are to receive scaffold support

In this case, delete the existing scaffold support by using **Unload Support** function in Magics after importing the new parts. Once the old support has been deleted, click **Prepare Platform**. As a result, a new platform-wide scaffold support for the existing and the new parts on the platform will be created.

None of the new parts are to receive scaffold support

In this case, you have two options:

- *Keep existing part orientation and their scaffold supports*

Click **Prepare Platform**.

Make sure you choose **Processed Part** and **Fixed Position** options for the parts that have scaffold supports.

- *Re-arrange parts and re-create supports*

Delete the existing scaffold support by using **Unload Support** function in Magics.

Click **Prepare Platform**.

Use the **Automatic** and **Translation & Rotation** options for all parts.

8.8. How to assign classification and placement options to a group of parts

Question:

Can I assign options for classification and/or placement to several parts at once?

Answer:

Yes, you can. You need to first select several parts. There are two possible ways to do select several parts at once:

1. Individual selection:

Press CTRL and hold while clicking each part in the list you wish to select.

2. Group selection:

Select first part from a block of parts. Press SHIFT and hold while clicking the last part in the block. All files between first and last are now selected.

Proceed to assign classification and/or placement option to this selected group of parts as applicable.

8.9. How to delete single cone supports

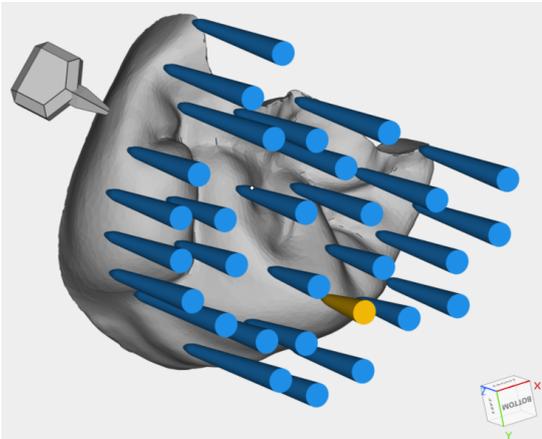
Question:

Can I delete specific cone supports after the platform has been prepared? And can I do this by selecting the supports individually from the image?

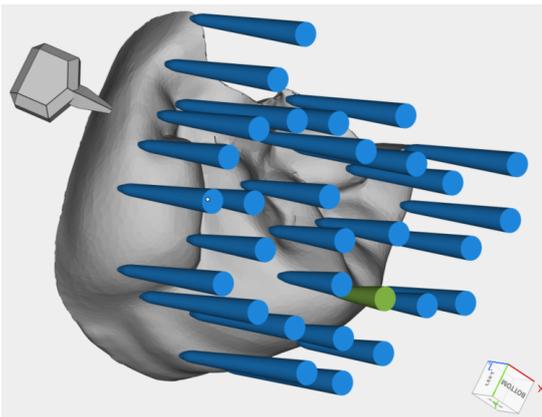
Answer:

Yes, you can do this using Magics:

1. In Magics on ribbon **Support Generation**.
2. Select part from which you wish to delete a single cone support.
3. Click **Manual Support**. You have now entered the Support Generation (SG) module.
4. From the toolbar make sure the  **View all support** option is enabled. All supports are now displayed. Any support that is highlighted in the **Support List** is shown in yellow.



5. From the SG ribbon choose **Select item**. The cursor changes. Using the cursor, select the support you wish to delete. Click until the support is shown in green.



6. From SG ribbon choose **Deleted selected** to delete the support. The support is not shown on the part and in the **Support List** any more.



9. References

9.1. Part Types

The following part types are currently supported by the Dental Module:

- Bridges
- Crowns
- Partial

Part types are needed for:

- Part classification
 - ☰ [4.3 Classification of Part Types on page 18](#)
- Grouping of parts
 - ☰ [5.1 Grouping Parts on page 22](#)

9.2. Profile Editor Parameters

This chapter will serve as a reference point for the different parameters available in Profile Editor.

- ☰ [4.2.3 Edit Profile on page 16](#)

9.2.1 Labeling

Create Labels

For Crown or Bridge substructures, you need to define whether you wish to **Create labels**. You have these options under **Part type & Settings**:

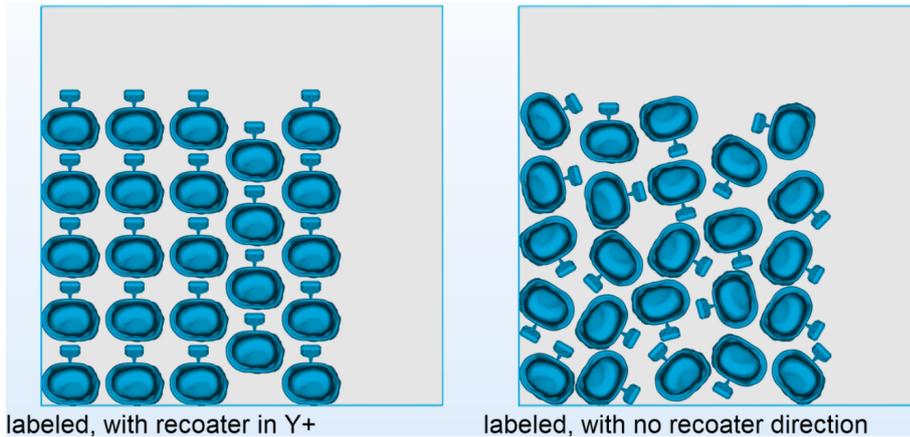
- **Enabled**: For this part type labels are generated.
- **Disabled**: No labels are generated for this part type.

Directed Labels

For all labels that are created on the platform, under **Label** you can also define whether you want to have **Directed labels**:

- **Enabled**: All labels on the platform will point in recoater direction.
- **Disabled**: Labels will not point in any specific direction but instead will fill space as it is available.

The following image illustrates the influence of directed labeling.



Auto-numbering for Labels

The Dental Module always issues an auto-number for each part on the platform. In the **Label** section of the Profile Editor section you can define whether you wish to this **Auto-numbering** for the label text.

- **Enabled:** Each part on the platform receives a unique number that is used as label text for this part. The assignment between number and part name is shown in the Approval report.

 *Approval Report* on page 26

- **Disabled:** The label text for the parts is not determined. You can use regular expressions to determine the label text.

 *Tutorial: Using Regular Expressions to Create Label Texts* on page 112



Labels must be enabled for a part type in order for auto-numbering to work.

Using Regular Expressions to Create Label Text

You can use regular expressions to extract alpha-numeric strings from the part names to be used as labels for your part. *Tutorial: Using Regular Expressions to Create Label Texts*

 *Tutorial: Using Regular Expressions to Create Label Texts* on page 112



Labels must be enabled for a part type and **Auto-numbering** must be disabled in order for regular expressions to work.



In case the defined regular expression does not yield a result, the auto-number will be used as label text.

Label Dimensions

Using the parameters **Tag height** and **Text offset** you can determine the dimensions of your labels and thus indirectly the font size:

- **Tag height** [mm]: Font size + Margin



- **Text offset** [mm]: Height of the text measured from the label.



If you enable the option **Engraved** the label text will be offset into the label.



If the label text is too small, increase the value for **Tag height**.

9.2.2 Reduced Defect Sensitivity

The automatic Fixing algorithms in the Dental Module are very powerful. But sometimes they cannot produce an error-free part. You can opt to use **Reduced Defect Sensitivity**:

- **Enabled**: Continue the Dental Workflow with all parts regardless of their fixing status.
- **Disabled**: Discard parts where the automatic fixing was not fully successful.



The automatic fixing algorithms of the Dental Module are always fully carried out. This option simply determines whether parts are ignored after the fixing or not.

9.2.3 Supports

Support Types

You can choose a support type for every part type (see *9.1 Part Types* on page 56). Set the support type under **Part type & settings**. Available support types are:

- **CONE**: Parts are supported individually using cone supports.
- **SCAFFOLD**: One scaffold support structure is generated which covers all parts flagged for this support type.



If you decide to use scaffold support you will not be able to move your parts individually after generating support.

Support Types Options

These options are available for all support types (i.e. Cones and Scaffold):

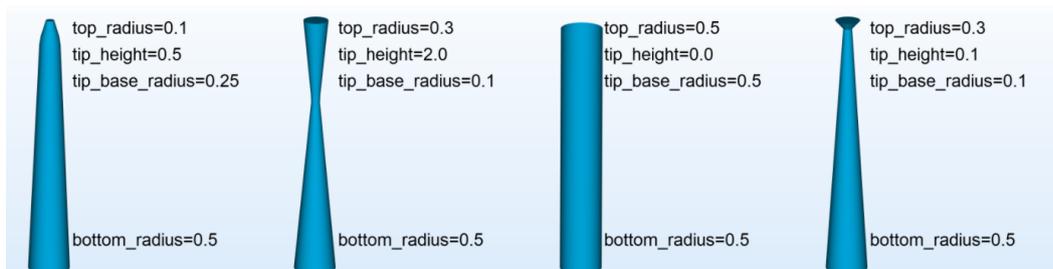
- **Create supports for surplus parts** [Enabled/Disabled]: Surplus parts are parts that are not nested on the platform and will be removed in the Approval phase. If you choose to generate support nonetheless, you may be able to add some parts to a created Dental Platform to increase nesting density (see *8.5 How to add more parts to an existing Dental Platform* on page 53)
- **Add supports to labels** [Enabled/Disabled]: You can choose to also add support structures to your labels.
- **Distance to margin line** [mm]: You can set the value for the distance to the margin line in which no support is to be created.

Cone Support Settings

These parameters are available to define cone supports.

- **'Contact part' radius** [mm]: Cone's top radius where it comes in contact with the part.
- **Penetration length** [mm]: The distance a cone will penetrate into the part.
- **Tip height** [mm]: Height of the top part of the cone.
- **'Tip base' radius** [mm]: Radius of the bottom of the tip where it merges into the lower part of the cone support.
- **'Contact platform' radius** [mm]: Cone's bottom radius where it comes in contact with the platform.
- **Self supporting angle** [°]: Triangles which have an angle to the XY plane that is higher than this angle are supposed to be self-supporting. Hence, these triangles have not need for support. This parameter is typically machine-technology dependent.
- **Minimal distance between cones** [mm]: Minimal distance between any two cones.

The following image illustrates the influence of some of the parameters on the way the cone supports are generated:



Scaffold Support Settings

- **Point Distribution** parameters:

- **Interior point influence region** [mm]: A circular area of influence with user-defined radius is assigned to each interior contact point.
- **Border point influence region** [mm]: A circular area of influence with user-defined radius is assigned to each border contact point.
Tip: Border contact points should have a smaller radius of influence than interior contact points, because they must be able to withstand impinging recoater forces.
- **No support offset** [mm]: The overhang distance for which no support is needed.
Tip: The no support offset value should be bigger than or equal to the border point influence region. The no support offset also has a large influence on the minimum self support angle, because as the no support offset value is increased, the distance between two supporting layers on an angled surface will also increase.
- **XY offset** [mm]: The distance between a border point and its closest border (applicable if possible).
- **Minimum self support angle** [°]: The minimum angle for which the part is self-supporting.

- **Top Connection** parameters:

- **Connection width** [mm]:
- **Contact margin** [mm]: The distance between the part surface and the contact point before it broadens to its connection width.
Tip: The contact margin does not account for z-compensation.
- **Penetration length** [mm]: The distance a contact point will penetrate into the surface of the part.
Tip: The penetration length does not account for z-compensation.
- **Contact width** parameters: Determine the width of the different part contact points.
 - **Anchor point** [mm]: The width of the part contact points for interior points.
 - **Border point** [mm]: The width of the part contact points for border points.
 - **Interior point** [mm]: The width of the part contact points for anchor points.

- **Bottom connection** [mm]: Parameters related to the geometry of the contact points and the connections to the grid for up-facing surfaces.

- **Connection width** [mm]: The connection width is the width of a support that leads to the contact point.
- **Contact margin** [mm]: The distance between the part surface and the contact point before it broadens to its connection width.
- **Contact width** [mm]: The support width at the contact point where it touches the part.

- **Grid parameters:**
 - **Diamond angle** [°]: The elevation angle of the diamonds.
 - **Diamond width** [mm]: The width of the smallest diamonds that make up the lattice body of the support structure.
Tip: As the diamond width is increased, the flexibility of the supports is also increased. If numerous connections originate from one grid point with high frequency, it is recommended to decrease the diamond width.
 - **Edge width** [mm]: The width of the diamond edges.
Tip: As the edge width is increased, the support will increase in stiffness. Stiffness is highly dependent upon support over-cure and thus a test build is recommended to obtain desired compressibility (for removal).
 - **Rotation around z** [°]: The angle around the z axis by which the support grid is rotated relative to the platform.
Tip: Especially with viscous, ceramic materials or a hard recoater, it is recommended to give a rotation to the support structure. Then, the recoater will exert less forces on the grid structure.

Minimize Build Height

For Bridge Substructures you can determine if the Dental Module tries to minimize build height (i.e. dimension in z). Select from:

- **Enabled:** Build height in z will be minimized.
- **Disabled:** Build height will not be taken into account when finding the optimal position and orientation for the parts.

Partials Orientation and Partial Tilt Angle

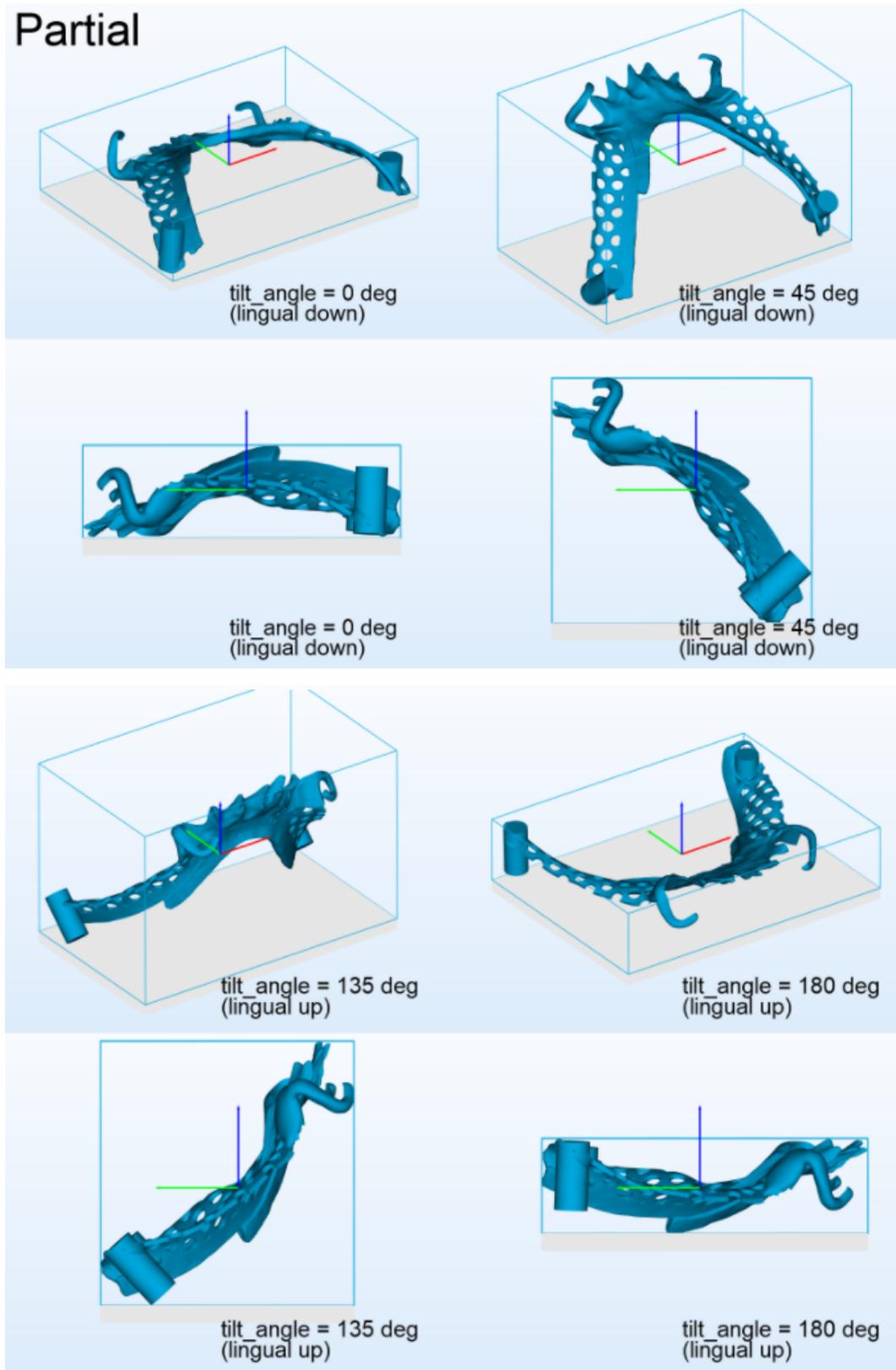
The **Orientation** of partials is done with one of the following options:

- **LINGUAL_DOWN:** Surface of partial facing to palate will be oriented facing down.
- **LINGUAL_UP:** Surface of partial facing to palate will be oriented facing up.

The **Tilt Angle** is given in degrees and describes the angle of the partial structure plane in relation to the XY plane.

The following images illustrate the interdependence between tilt angle and orientation.

Partial

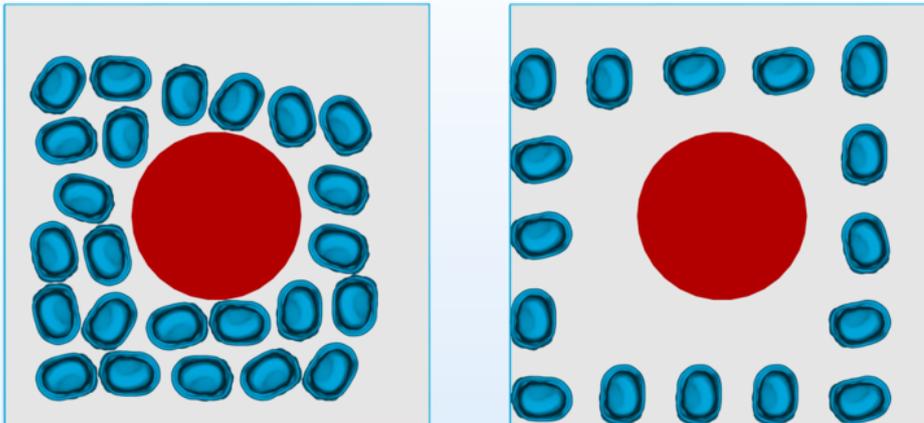


9.2.4 Part Placement Options

These parameters are available to determine the part placement on the platform:

- **Part interval** [mm]: Minimum distance between parts on the platform.
- **Platform margin** [mm]: Minimum distance that parts need to be positioned from the border of the platform.

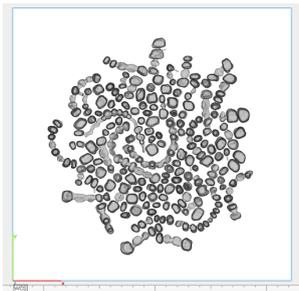
The following image illustrates the parameters Part interval and Platform margin:



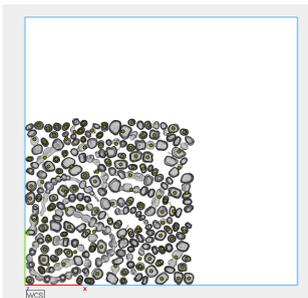
Part interval = 0.0 mm
Platform margin = 3.0 mm

Part interval = 3.0 mm
Platform margin = 0.0 mm

- **Placement**: Defines the type of placement on the platform. Select from:
 - **CENTER**: The parts are placed around the platform center.



- **MINIMAL_XY**: The parts are placed with minimum expansion in X and Y direction.



Default Z-Height

For each part type (crown, bridge, partial) you can set options for the Z-height positioning of the parts on the platform. The Z-height is determined in mm.



9.3. Typical Warning Messages

This chapter lists the most common error messages, what they mean, and what might need to be done to fix them.

Fixing bridge failed

Full message: Fixing bridge <Part_Name> failed, fallback to shrink wrap (this may influence the mesh morphology)

This warning indicates that the fixing for a bridge part used the ShrinkWrap functionality. This operation usually works fine, but we advise a visual inspection before continuing to make sure that the mesh was not changed significantly.

Part fixing failed

Full message: Part <Part_Name> (type=<Part_Type>) fixing failed

This warning indicates that the part could not be fixed and is therefore discarded from the flow. These parts will show up in red and will be arranged next to the platform in the final result.

Could not create label

Full message: Could not create label with text 'your_label_text'

This warning indicates that the label text is too long. We advise to keep label text to a maximum of four (4) characters.

Label may stick out above the part

In rare cases, a label cannot be placed correctly, i.e. in such a way that it does not stick out above the part mesh. In that case you might need to take note of the part to make sure that it can be allocated correctly later on.

Orientation is uncertain

Full message: Orientation of part <Part_Name> (type=<Part_Type>) is uncertain
and: Orientation top/down of part<Part_Name> (type=<Part_Type>) is uncertain

In very rare cases the automatic workflow is not able to position crowns and bridges correctly. In these cases a manual orientation and positioning might be necessary.

Part is of unknown type

Full message: Part <Part_Name> is of unknown type (no initial positioning performed)

If you try to position a part without it being classified, it will not work. This should not occur in the Magics module, since parts are always classified (maybe wrongly, but never "unknown").

Unable to generate scaffold support

There can be many reasons for this message. The most important reasons are: Either the configuration of the meshes on the platform may make it impossible for scaffold to generate supports or there may be an invalid license.

Empty support generated for part

Full message: Empty support generated for part <Part_Name> (type=<Part_Type>)

This message points to wrong input given to scaffold, but the user does not have control over this. An example could be intersecting contours in the slice info.

Please find a different support strategy for this part or try to fit it on another platform with other parts where scaffold can generate the support structure more easily.

Recoater direction is not set

Full message: Recoater direction is not set, matamx file defaults to POSITIVE_X

When saving the platform to a MatAMX file, there may be no recoater directions saved in the machine properties. In this case the Dental Module will assume Xpositive as the default direction.

If your machine has a different recoater direction, please select **Machine Properties** on **Build Preparation** ribbon in Magics, and on tab **General** configure the **Recoater Direction**.

Run only 1 instance of the Dental Module

Full message: Warning: You can only run 1 instance of the Dental Module.

This message can be displayed when Magics has not been shut down properly, e.g. because the computer has crashed. Sometimes, when restarting Magics the Dental Module is initialized a second time.

If this is the case, close Magics and in **Task Manager** locate the process `plug-in host`. End this process and then restart Magics.

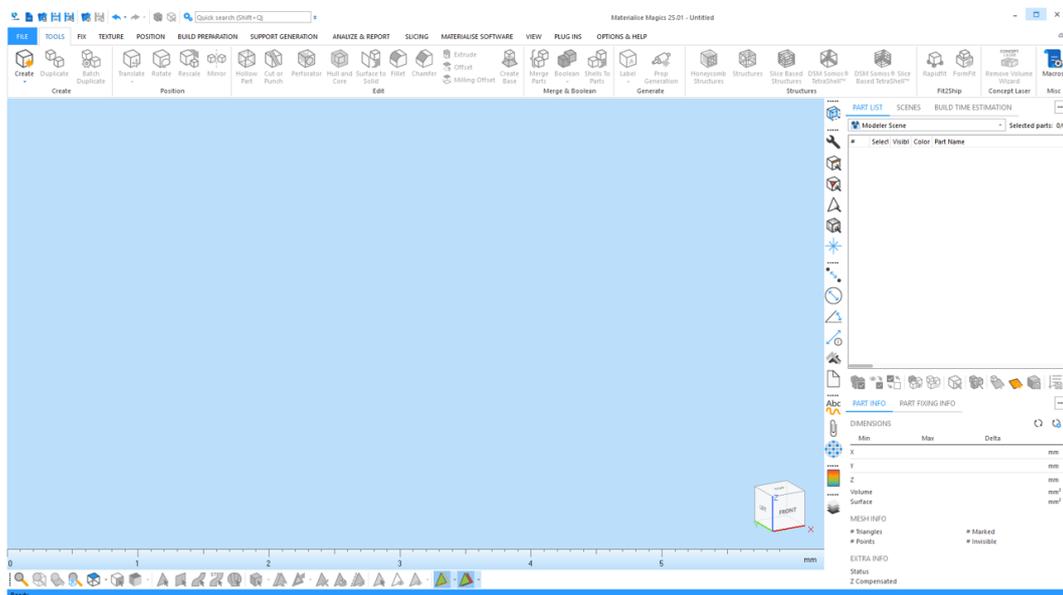
10. Tutorials

In this part of the user manual you will find tutorials to show you step-by-step instructions how to tackle specific tasks. At this time there is only one tutorial available. More will follow with the next release.

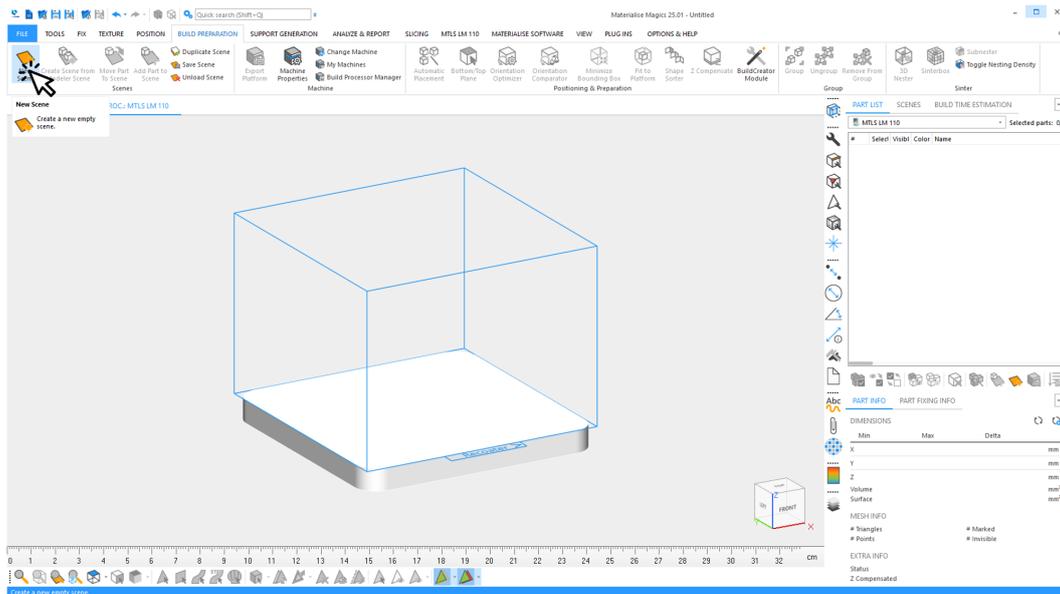
10.1. Tutorial: Getting Started

This tutorial describes the job-to-be-done of a user when preparing the dental platform for production.

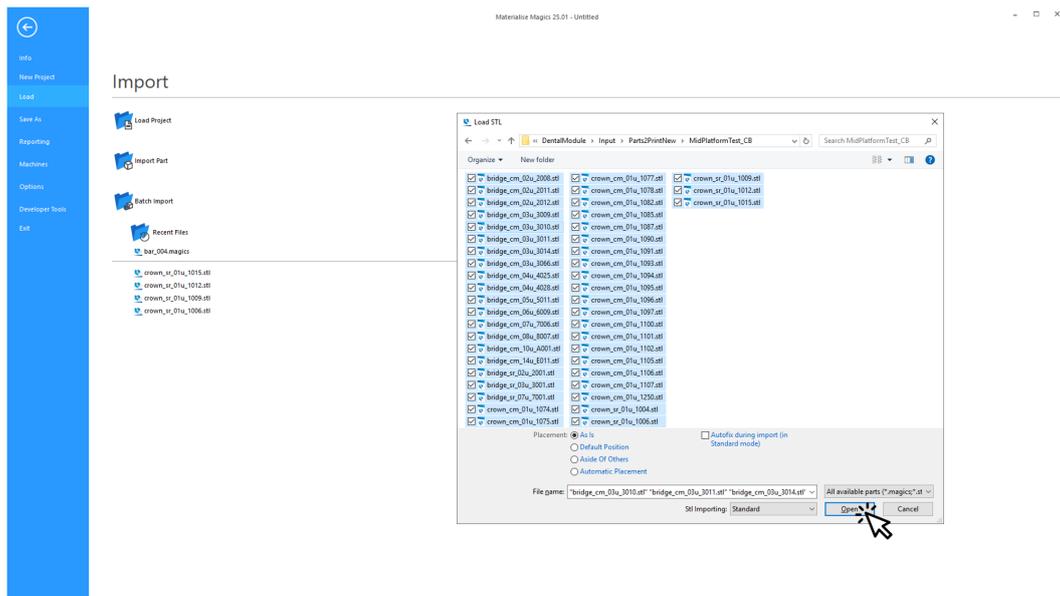
1. Create new build job file:
Start Magics RD or Magics Print.



2. Create scene for specific BP machine:

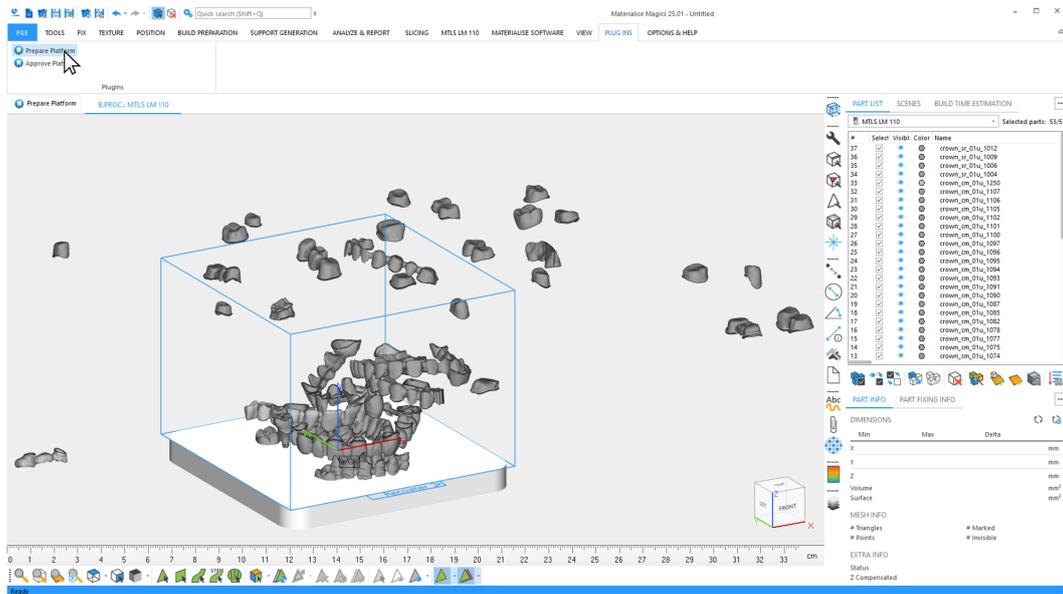


3. Select all dental parts to used for the next build job:

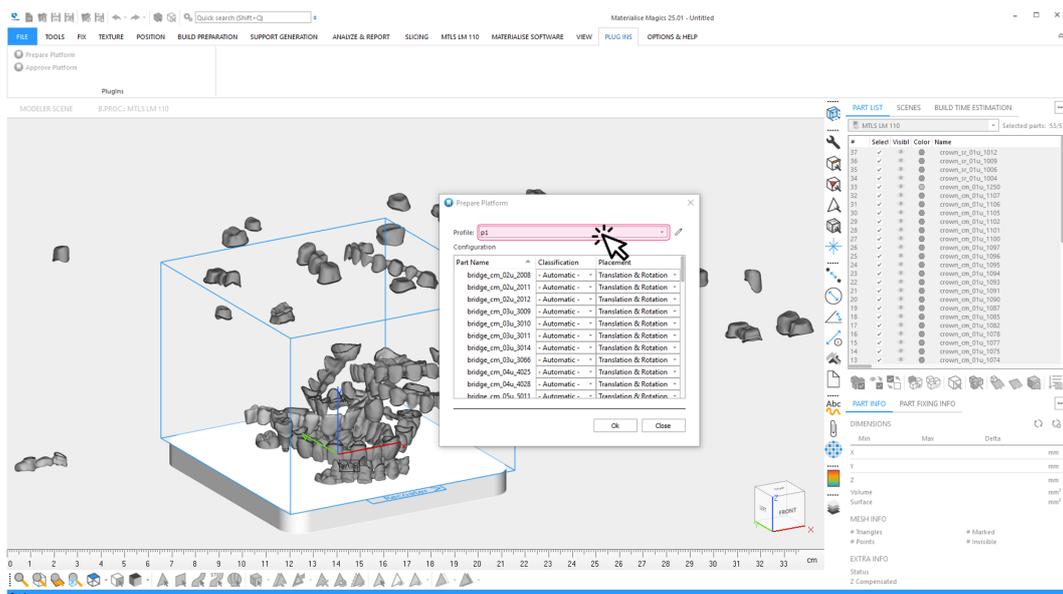


Click **Open**. All dental parts to be built are imported.

- Start the process of creating the dental build platform:
Click **Prepare Platform**.



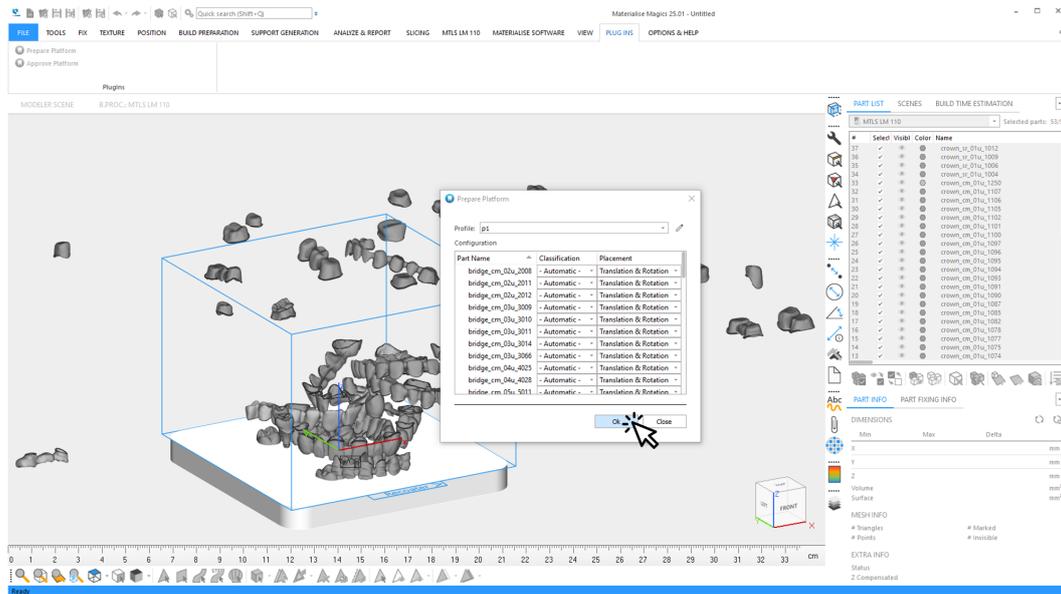
- Select profile to be used for automated data preparation.



In this example, only dental parts supported by the dental module are loaded. Therefore, there is no need to manually change the default option for **Classification** and **Placement**.

6. Start automatic creation of the dental platform:

Click **Ok**.

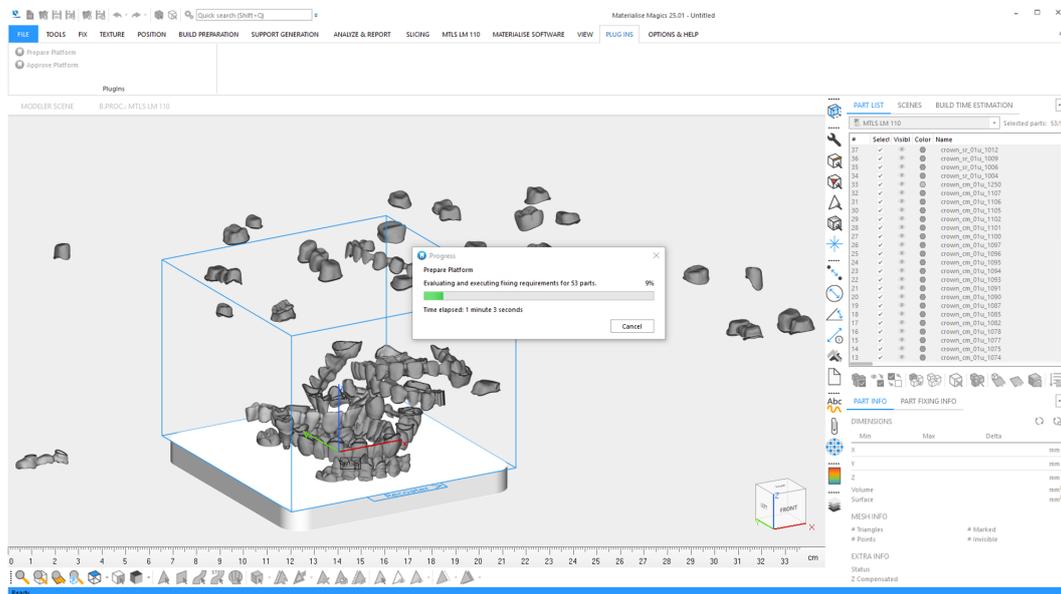


7. During automatic creation, you will see information about:

- current processing step and the overall progress
- events such as warnings or errors

Typical warning: uncertain classification of part type.

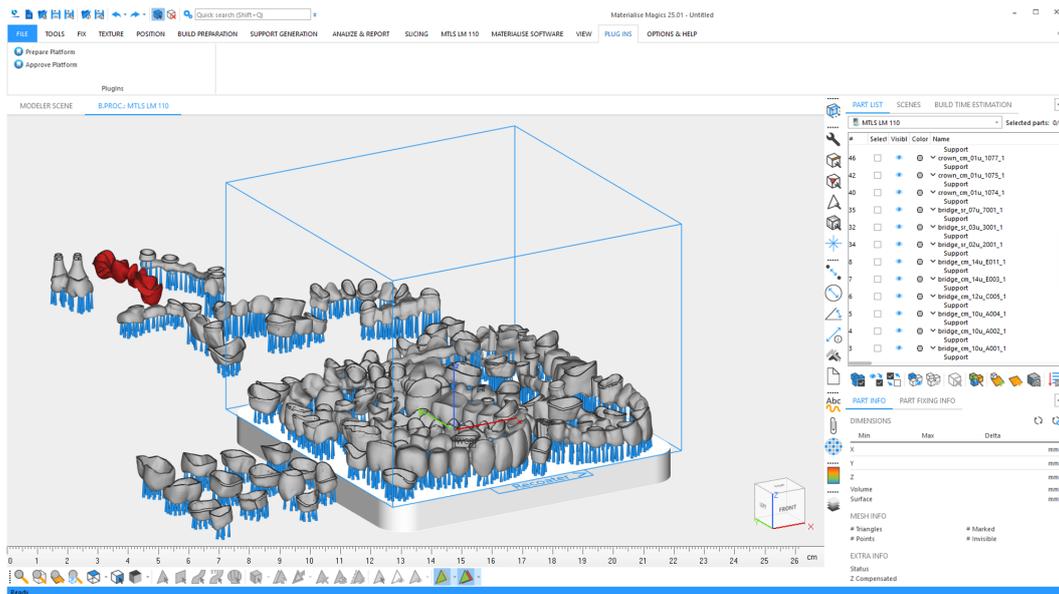
Typical error: failure to fix part so that part is excluded from further processing.



☰ Typical Warning Messages on page 64

☰ Log Files from Platform Preparation on page 25

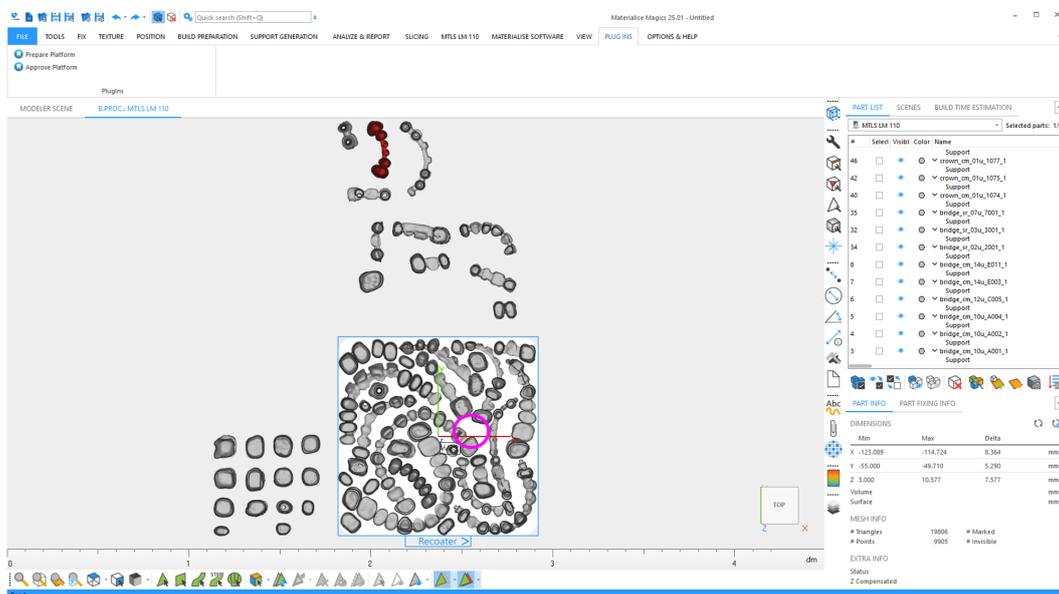
8. View results of Dental Module in Magics:



Part not nested are placed around the platform in a way that easy differentiation and access is possible.

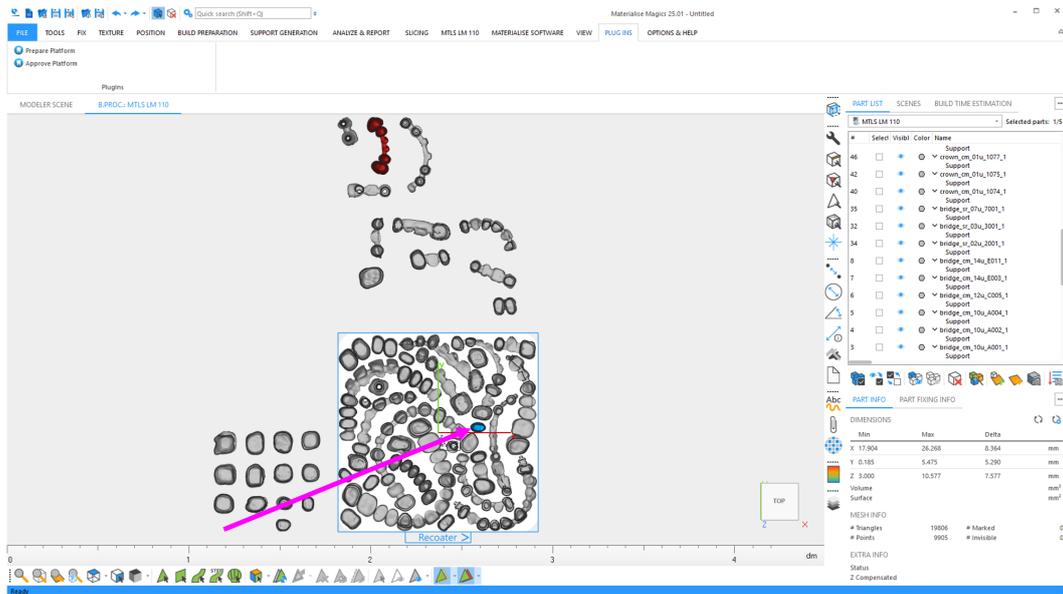
Prepare Platform on page 11

9. Inspect created platform:

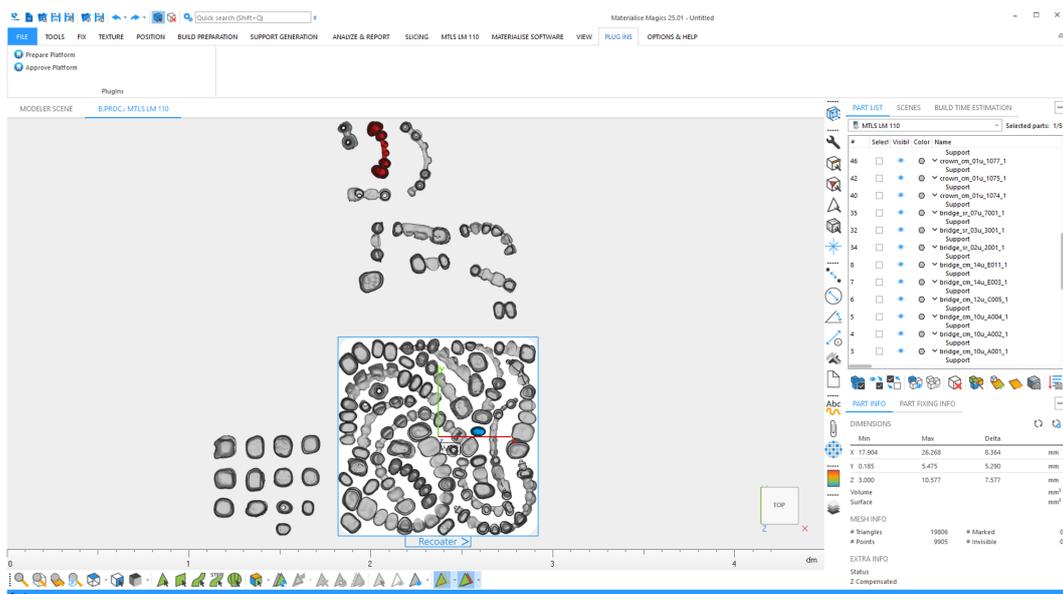


In this example, you have the possibility to place additional parts due to larger void areas on the platform. You can manually re-nest the placed parts if the Dental Module also fully prepares all non-nested parts. You can set this option in the Profile Editor.

10. Place additional non-nested (but fully prepared) parts on the platform.
Rearrange the parts already placed on the platform if necessary.



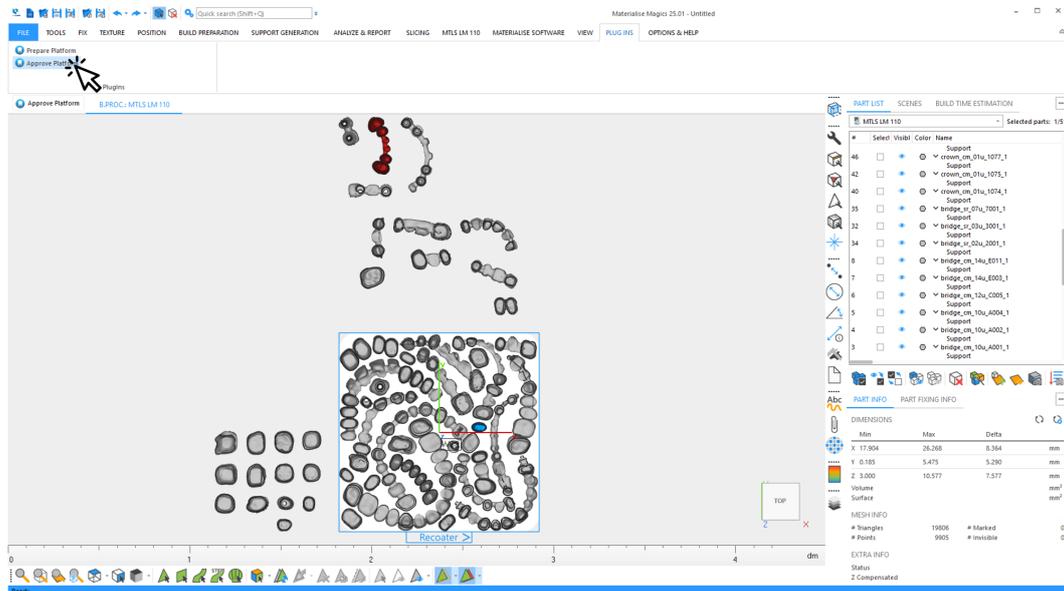
11. Manually move and rotate parts:



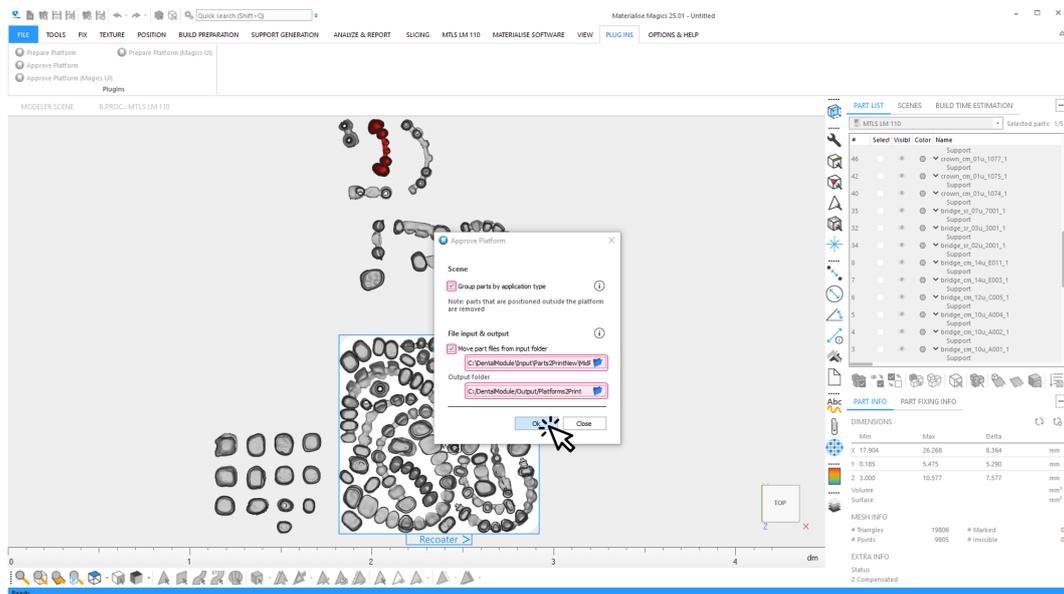
In this example, you can place one additional part with a total of 1 tooth unit.

12. Approve platform if you are satisfied with the result:

Click **Approve Platform** to finalize the platform so that it can be sent to the Build Processor afterwards..



13. The approval process of the Dental Platform performs the following steps:

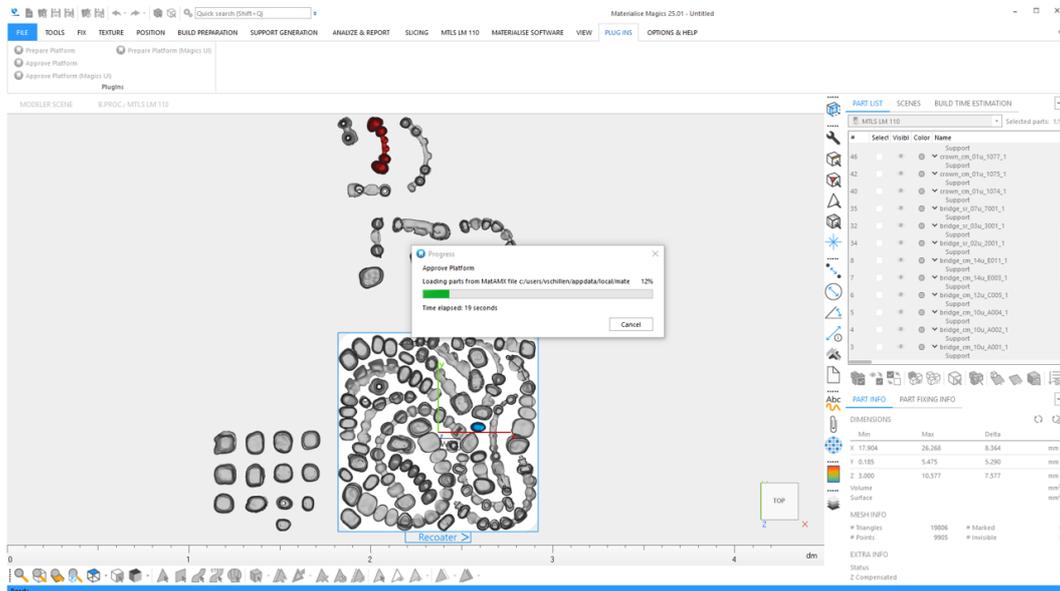


1. Remove all parts (and their supports) from scene if they are not COMPLETELY on the build platform.
2. (Optional) Move all STL data from dental parts on the platform from input folder into subfolder Source Data in output folder.
3. Save platform in time-stamped subfolder of output folder.
4. (Optional) Group all parts of same type including their supports into one group.
5. Generate report and save it in subfolder of output folder.

14. During automatic preparation, you will see information about:

- current approval steps and overall progress
- events such as warnings or errors

Typical warning: file could not be moved.

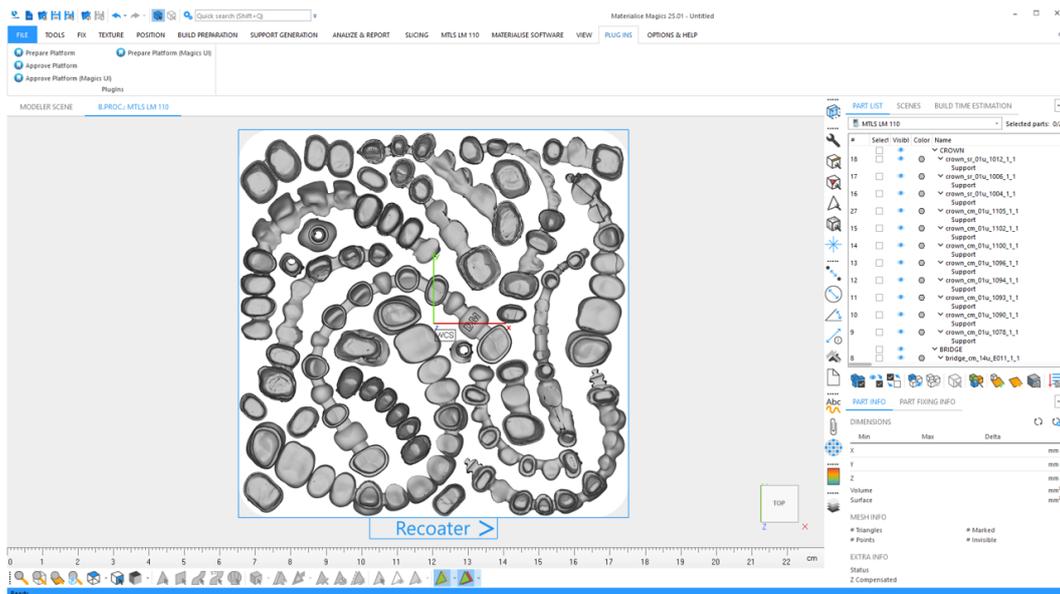


15. Approved dental platform in Magics is ready:

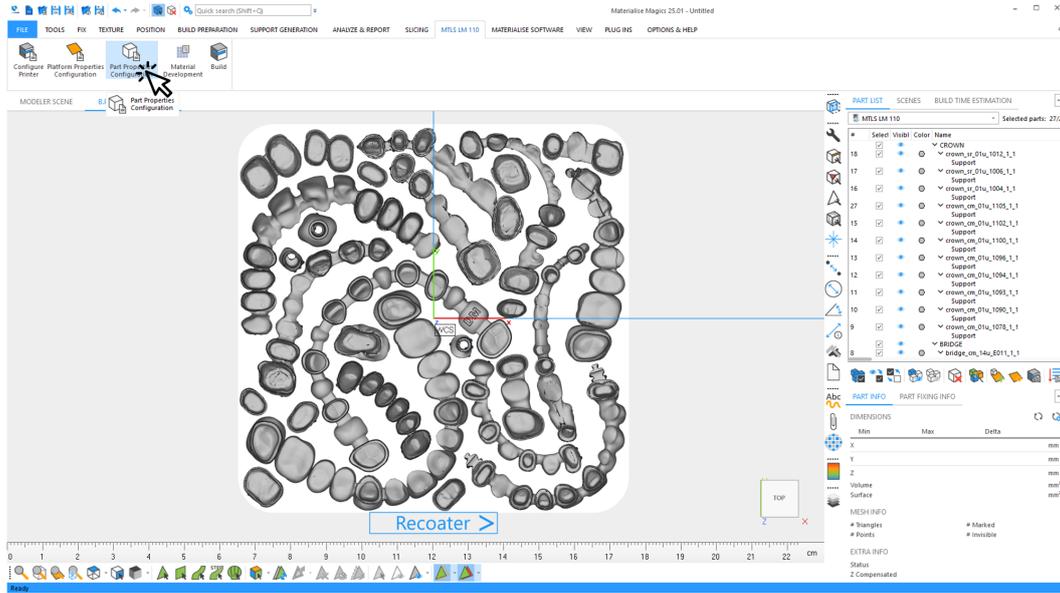
Click **Close** to leave dialog.

16. Platform is ready to be processed by the Build Processor:

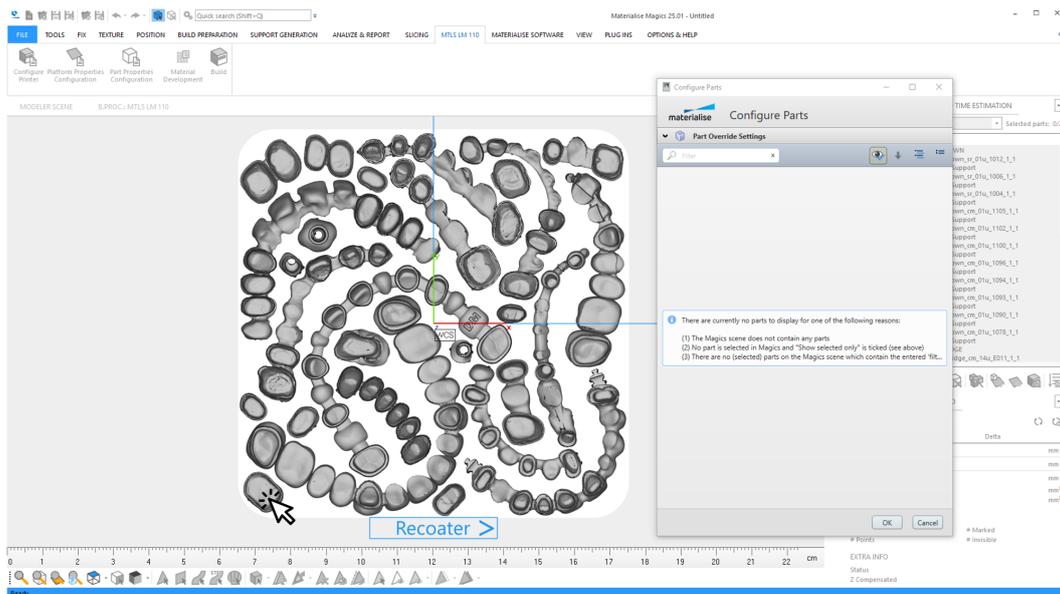
- All parts outside of the platform have been removed.
- (Optional) Parts are grouped according to their type.



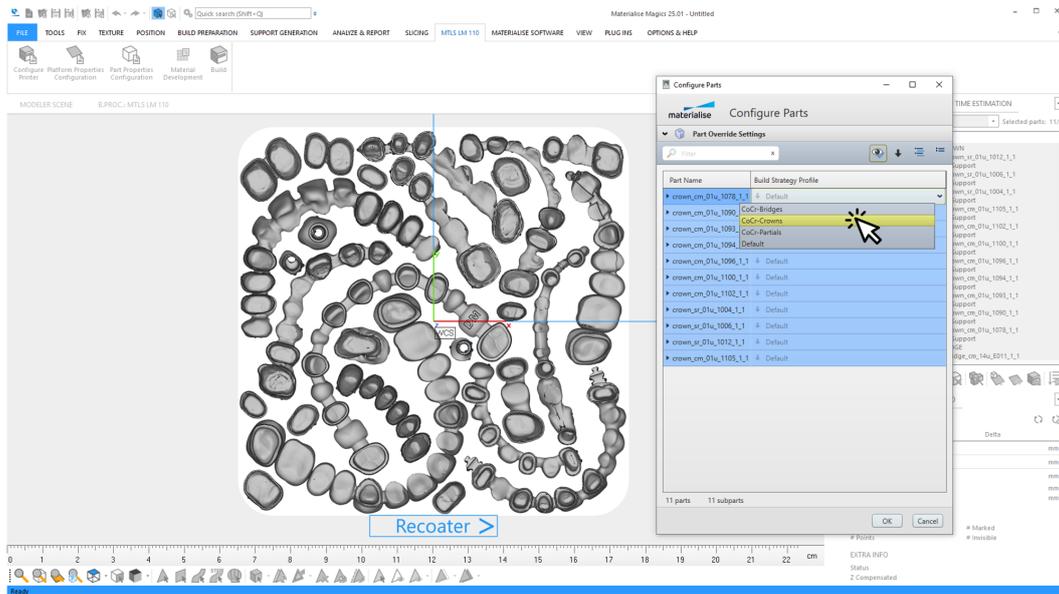
17. Start Build Processor:
In Magics click **Part Properties Configuration**.



18. In Magics scene, select a dental part of type "Bridge":

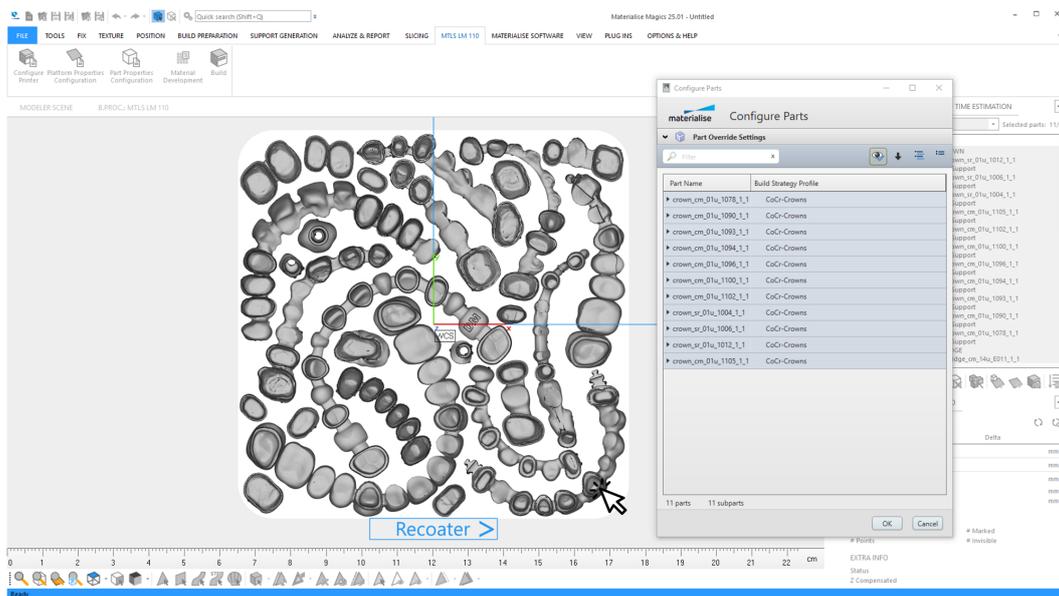


19. The Build Processor now displays all dental parts contained in the group "Bridge":
Select a build strategy to apply it to all parts in the group.

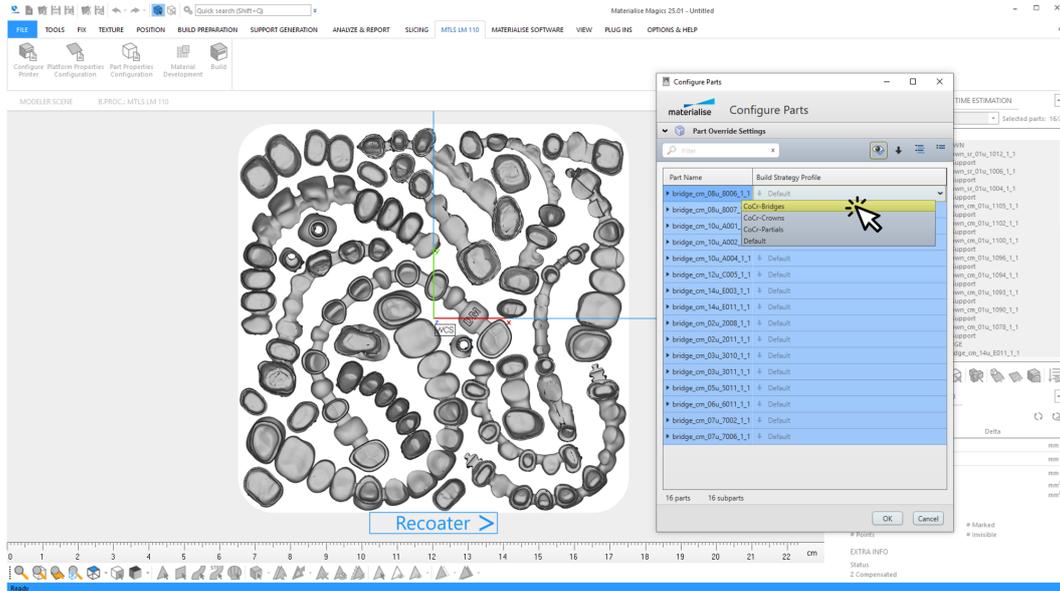


In this example: Select build strategy "D1" for bridges.

20. In Magics scene, select a dental part of type "Crown":

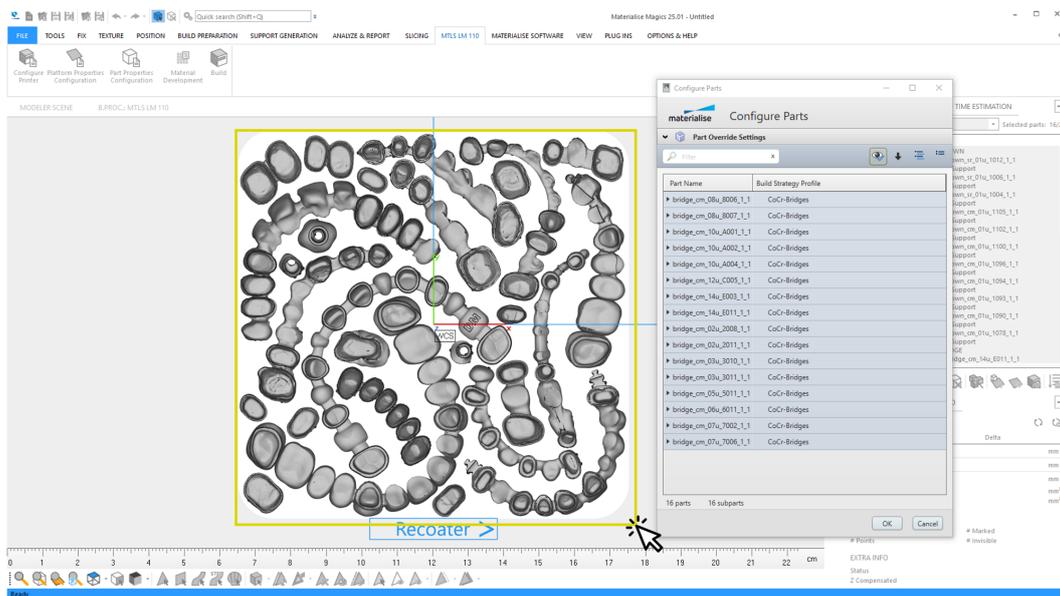


21. The Build Processor now displays all dental parts contained in the group "Crown":
 Select a build strategy to apply it to all parts in the group.

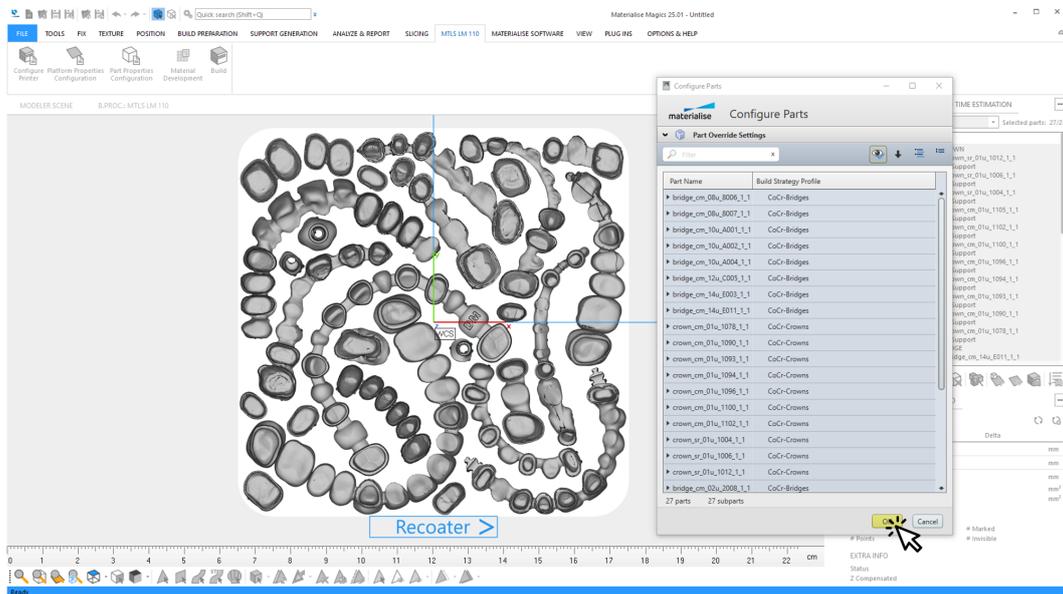


In this example: Select build strategy "D2" for crowns.

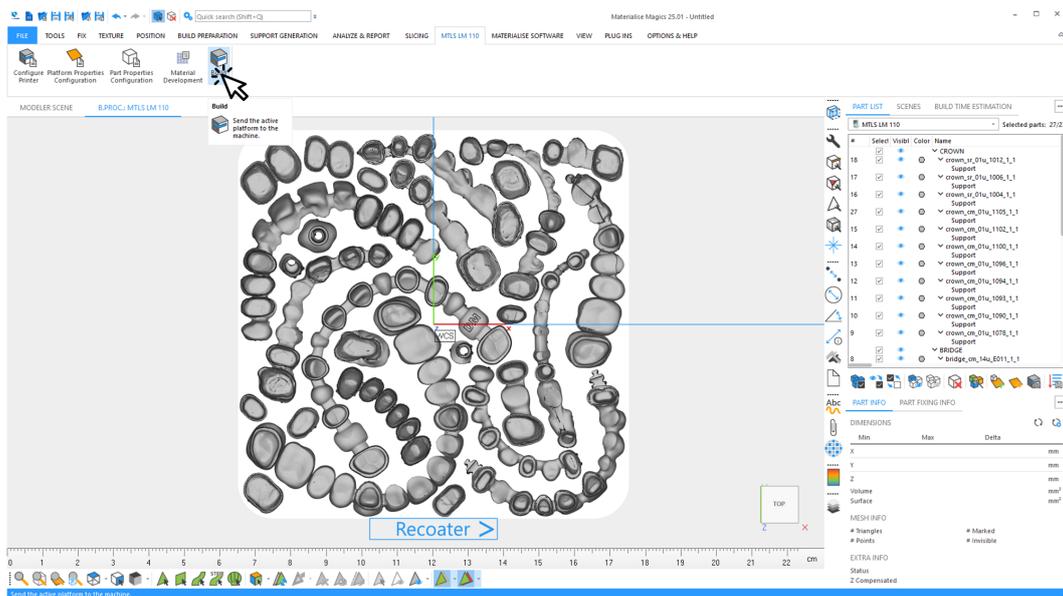
22. In Magics scene, select all parts on the platform:



23. The Build Processor now displays all selected dental parts. Different build strategies are assigned to crowns and bridges. Click **OK** to confirm assigned profiles.



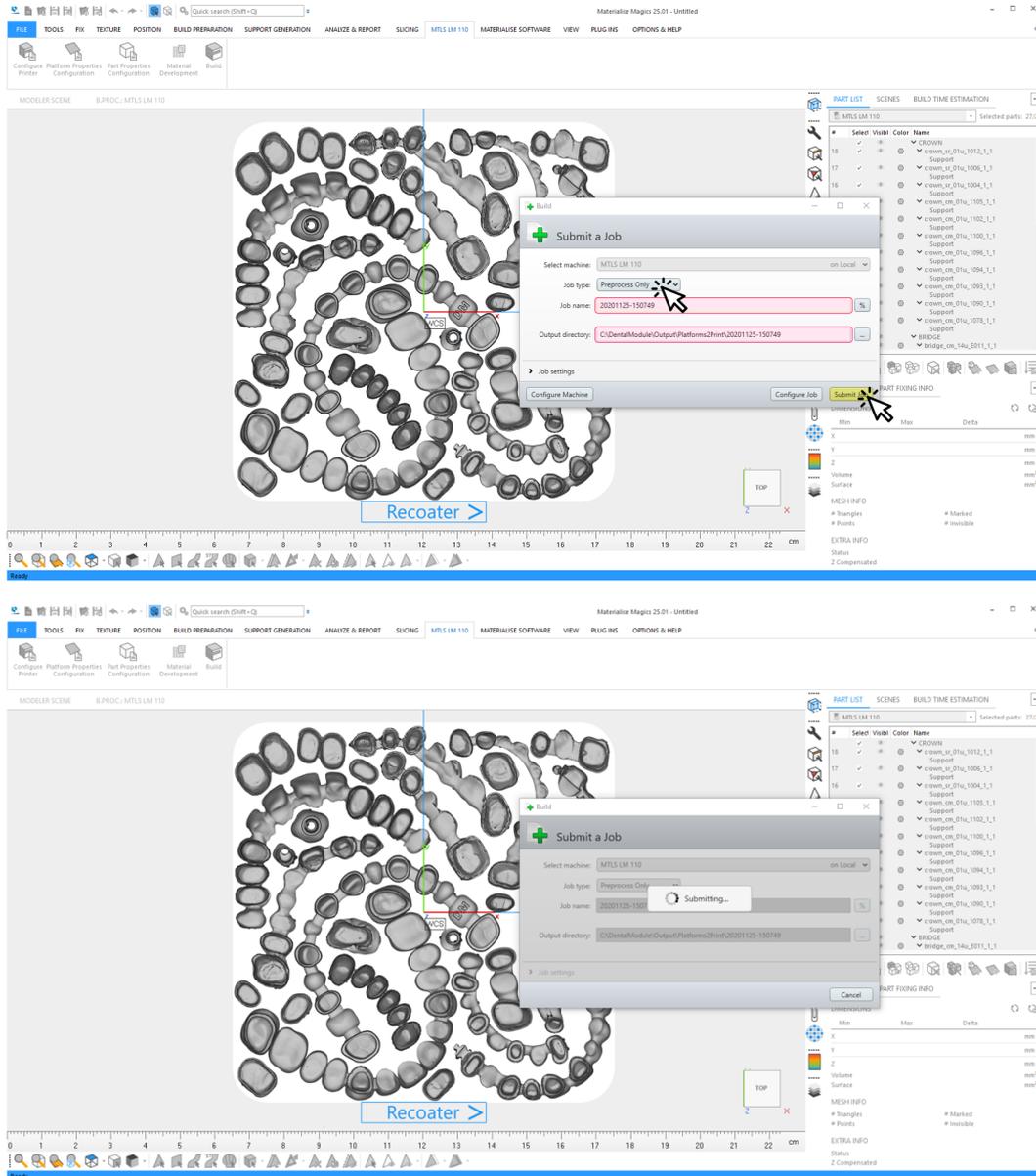
24. Start Build Processor:
In Magics click **Build**.



25. Enter specifics for the build job:

- **Job name:** should be the same as the saved platform
- **Output directory** for build job: should be the same folder where the platform was saved

Click **Submit Job** to start job file creation.



26. Data is passed to the Build Processor:

The screenshot shows the MTLs LM 110 software interface. The top section displays the machine name "MTLS LM 110" and its status "N/A". Below this, there are two main sections: "Build Jobs" and "Preprocess Jobs".

Build Jobs Section:

Name	Status	Progress	Preprocess End Time	Upload Time
No jobs in queue. Use an external 3D editor (e.g. Materialise Magics) which supports the Build Processor to submit jobs.				

Summary: 0 total, 0 running, 0 waiting, 0 failed, 0 finished

Preprocess Jobs Section:

Name	Status	Progress	Owner	Creation Date
20201125-150749	Preprocessing	Preprocessing Job	MATONE\vschillen	11/25/2020 3:34

Summary: 1 total, 1 running, 0 waiting, 0 failed, 0 finished

27. The job file is created:

The screenshot shows a Windows File Explorer window displaying the contents of a folder named "20201125-150749". The folder is located at "This PC > Windows (C:) > DentalModule > Output > Platforms2Print > 20201125-150749".

Name	Date modified	Type	Size
SourceData	25.11.2020 15:38	File folder	
20201125-150749.job	25.11.2020 15:41	JOB File	235.092 KB
20201125-150749_approval-report.html	25.11.2020 15:09	Microsoft Edge HTML Document	358 KB
20201125-150749_platform.matamx	25.11.2020 15:09	MATAMX File	45.978 KB
20201125-150749_platform-bottom_up.png	25.11.2020 15:08	PNG File	318 KB
20201125-150749_platform-top_down.png	25.11.2020 15:08	PNG File	266 KB
v0.32.1_20201125-150749.log	25.11.2020 15:09	Text Document	15 KB
v0.32.1_20201125-150749_errors.log	25.11.2020 15:07	Text Document	0 KB

8 items

28. Subfolder of output folder contains the following files for the generated platform:
- (Optional) Original data files (moved) for all dental parts on the platform in the folder **Source Data**.
 - Job file
 - Approval report
 - Approved platform
 - Top and bottom views of the platform
 - Log files

10.2. Tutorial: Working with Defective or Non-alignable Parts

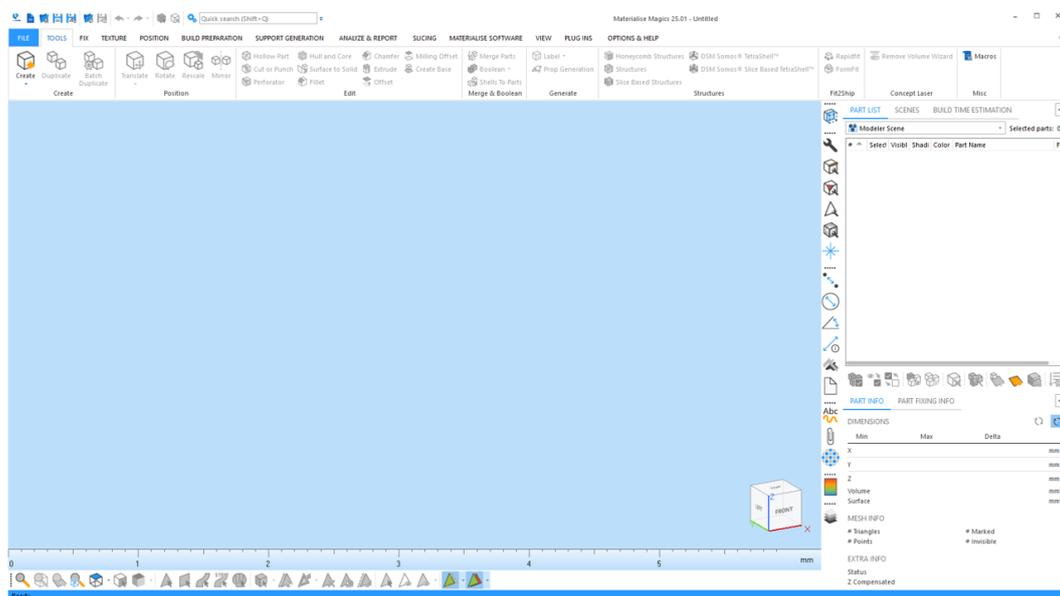
This tutorial describes the job-to-be-done of a user for preparing the dental platform in case there are dental parts that the dental module cannot repair with sufficient quality or for which occlusal surface recognition fails (for crowns and bridges only).

The following conditions need to be met in order to place these parts on the dental platform with a second pass:

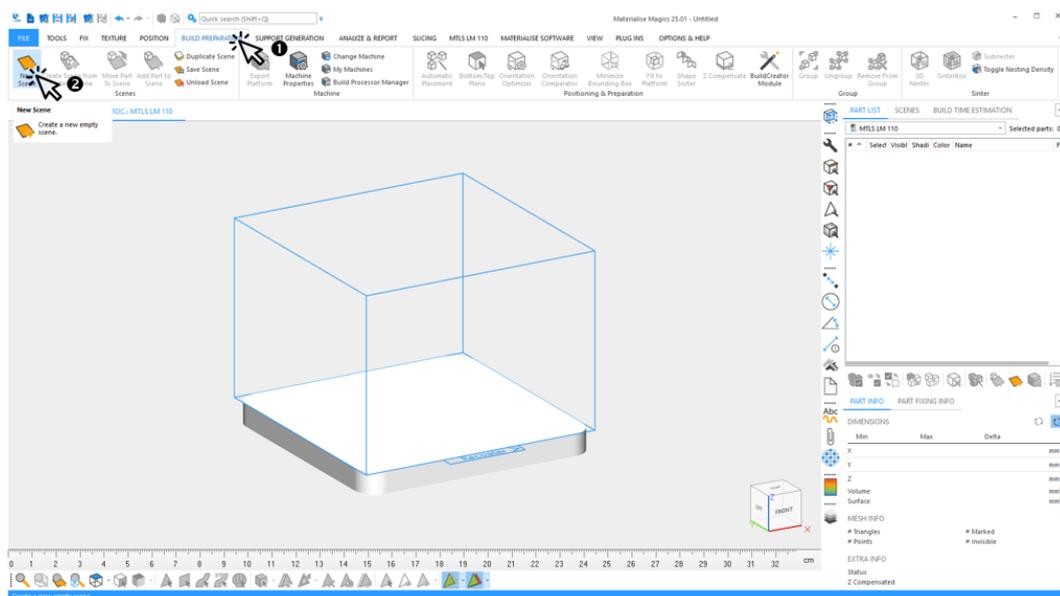
- The **Create supports for surplus parts** option must be activated in the parameter profile used.
- The parts for which the occlusal surface is not correctly recognized must already be correctly aligned before the first pass, so that the support is created on the correct side.

1. Create new build job file:

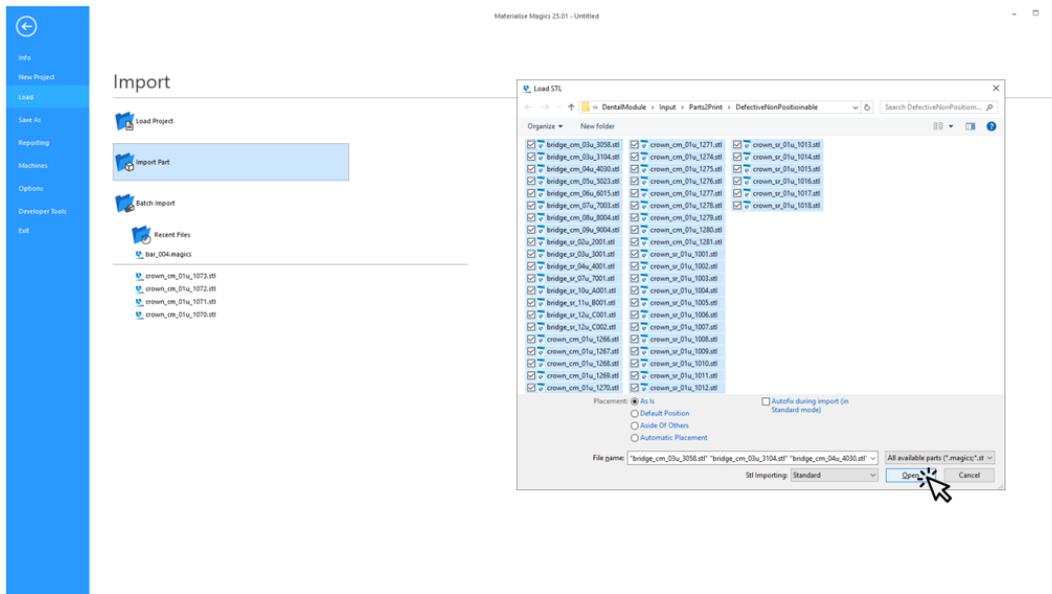
Start Magics RD or Magics Print.



2. Create scene for specific BP machine:

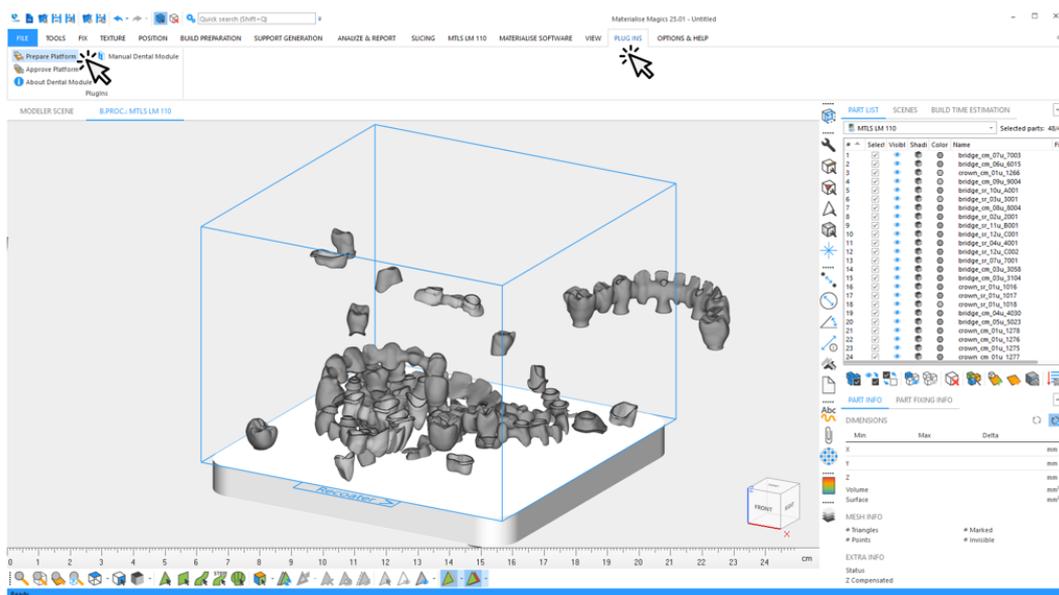


3. Select all dental parts to used for the next build job:

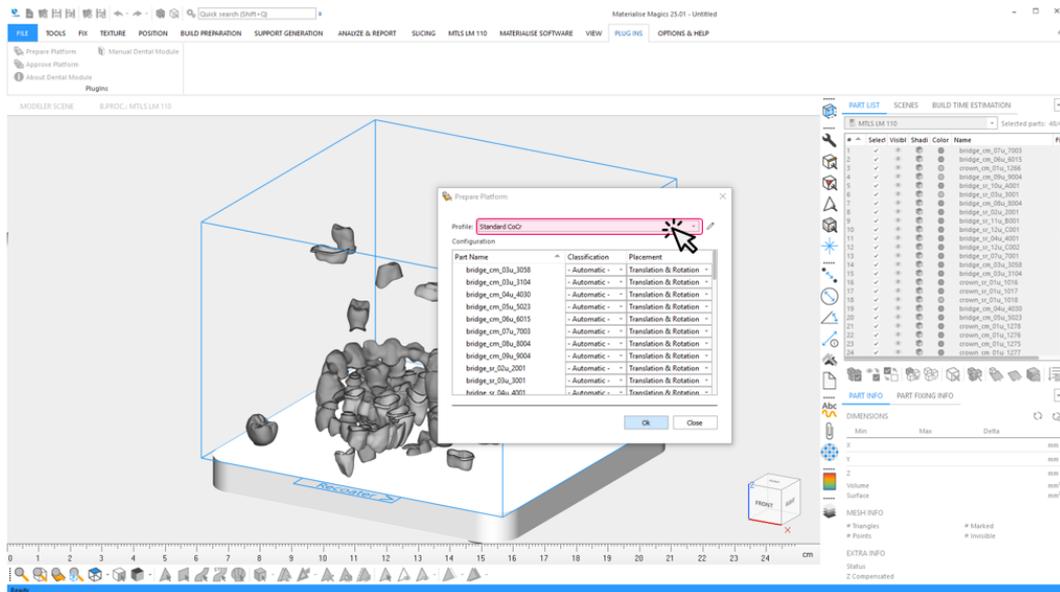


Click **Open**. All dental parts to be built are imported.

4. Start the process of creating the dental build platform: Click **Prepare Platform**.



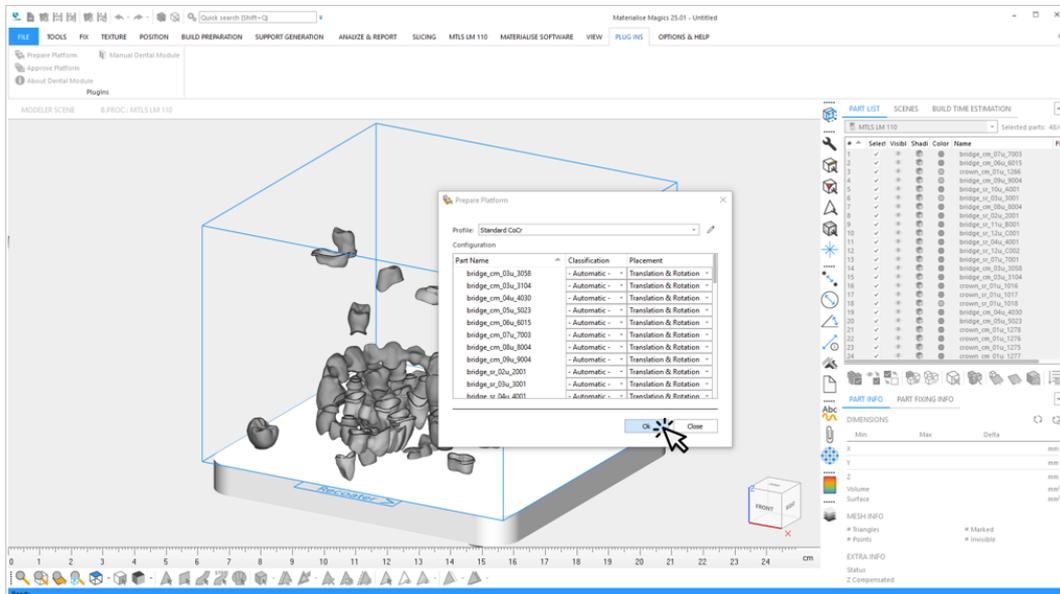
5. Select profile to be used for automated data preparation.



In this example, only dental parts supported by the dental module are loaded. Therefore, there is no need to manually change the default option for **Classification** and **Placement**.

6. Start automatic creation of the dental platform:

Click **Ok**.

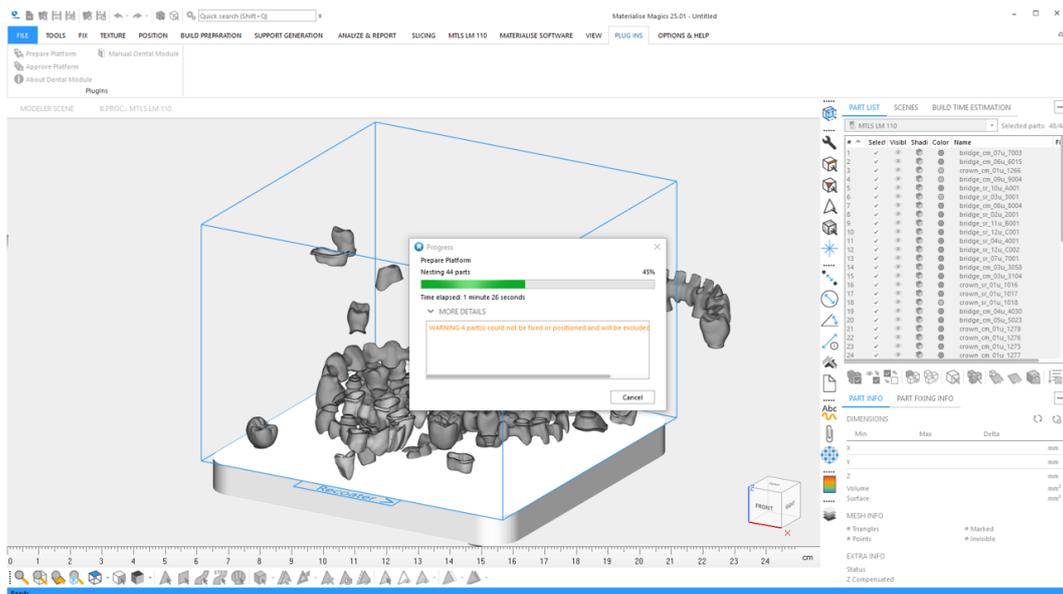


7. During automatic creation, you will see information about:

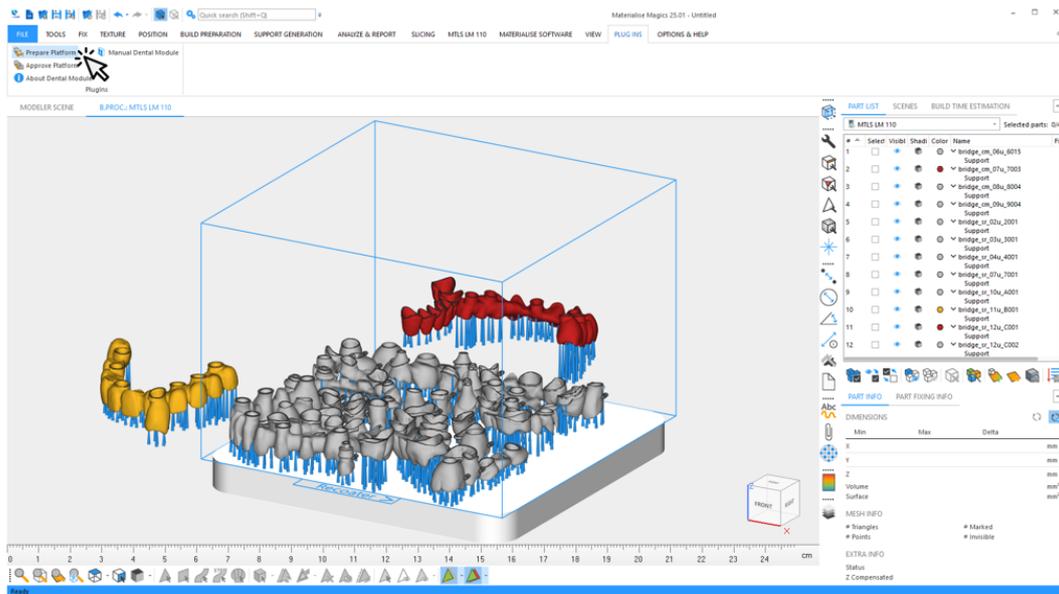
- current processing step and the overall progress
- events such as warnings or errors

In this example you have two causes of warnings:

- The dental module cannot repair two parts with sufficient quality.
- The dental module cannot determine the occlusal surface for two parts with sufficient certainty.



8. View results of Dental Module in Magics:



There are red and yellow-colored parts placed outside the dental platform. These colors have the following meanings:

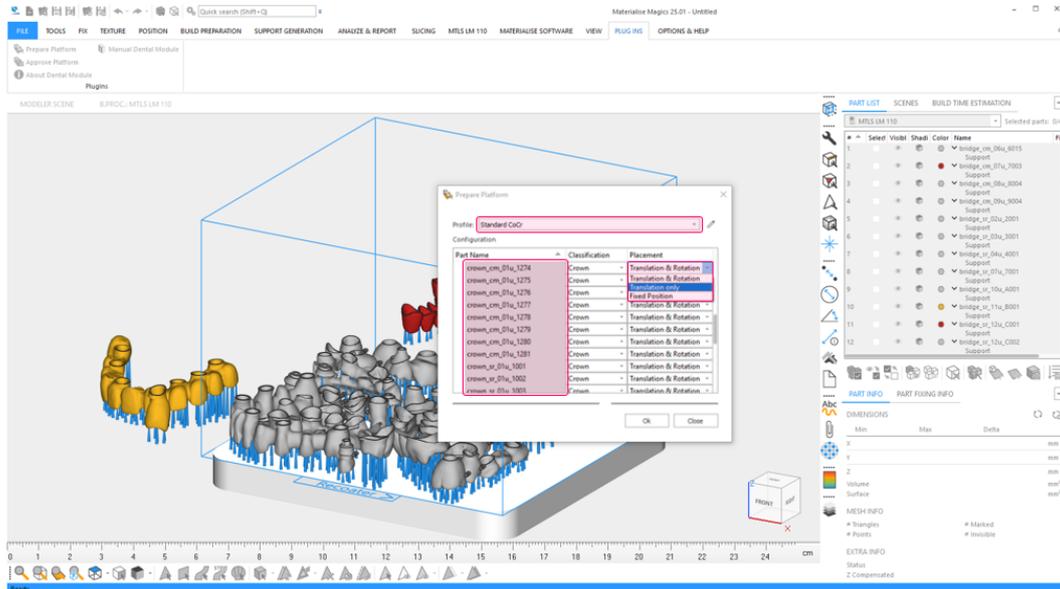
- Red: The dental module could not repair these parts with sufficient quality.
- Yellow: The dental module could not detect the occlusal surface of these parts with sufficient quality.



Parts placed outside the platform also have supports because the **Create supports for surplus parts** setting was enabled in the parameter profile.

9. If the parts placed outside the dental platform have been processed correctly in terms of alignment and support connection, it is possible that they will be placed on the platform in a second pass.

As in previous steps, click **Prepare Platform** and select profile to be used for automated data preparation.

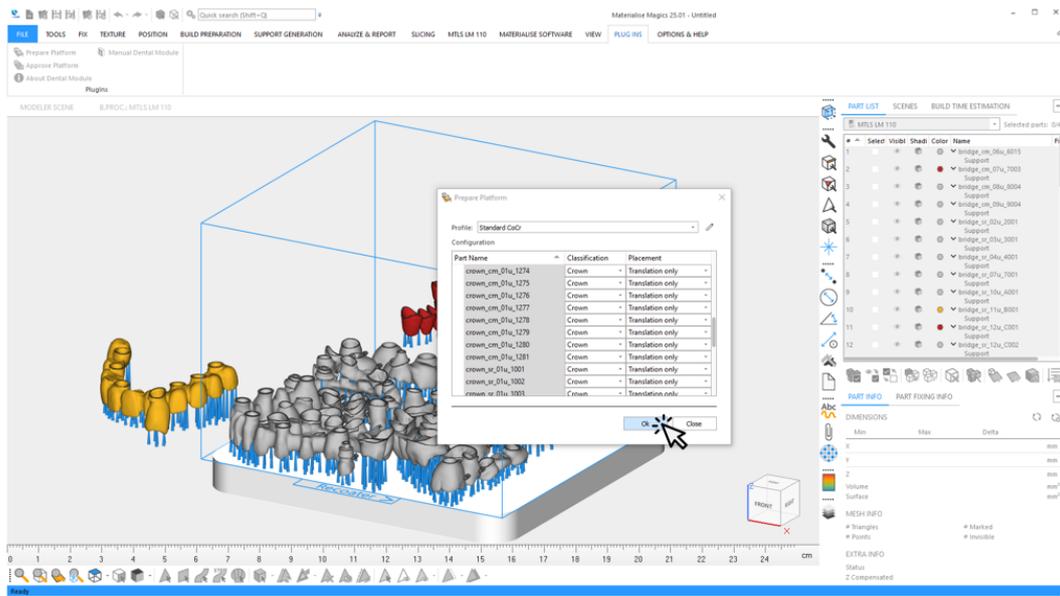


In this example, the crowns have received a label that is aligned in the direction of the recoater. To maintain their alignment, you need to set **Placement** to **Translation only** for all parts classified as **Crown**. You have the following options to select multiple parts classified as **Crown**:

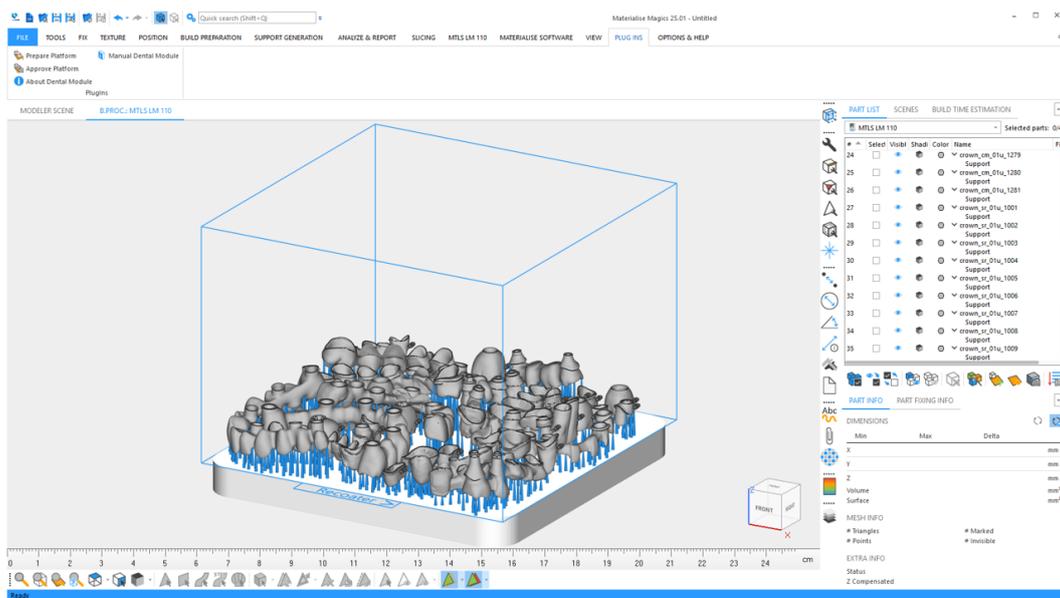
- Sort all parts according to their classes by clicking on **Classification** and select all parts from the type **Crown** with your mouse. The corresponding classes were determined automatically in the first run.
- Alternatively, you can make the multiple selection of the labeled crowns via “CTRL” button and mouse click on the part name.

After selecting all crowns, select the placement option **Translate only** for one of the selected parts. The option is applied to all selected parts.

10. Klick **OK** to start the second iteration of the automatic creation of the dental platform.



11. View the result of the dental module in Magics. All parts could be placed correctly on the platform in the second pass.



The platform is now ready to be approved and to be processed by the Build Processor.

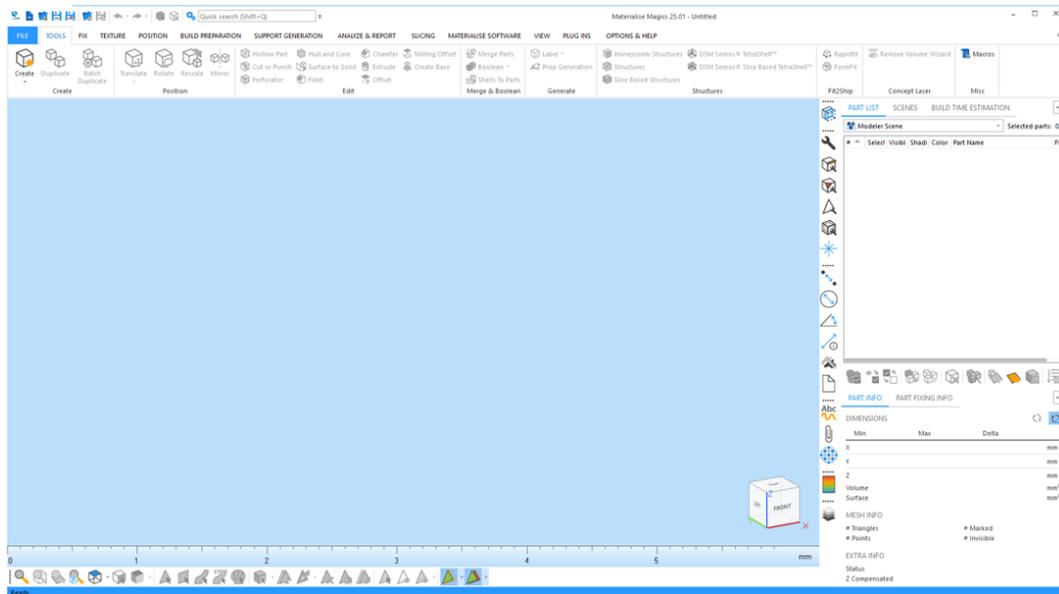
See *Tutorial: Getting Started* on page 66 to get more information about the platform approval and job file generation.

10.3. Tutorial: Obtaining a Completely Filled Platform

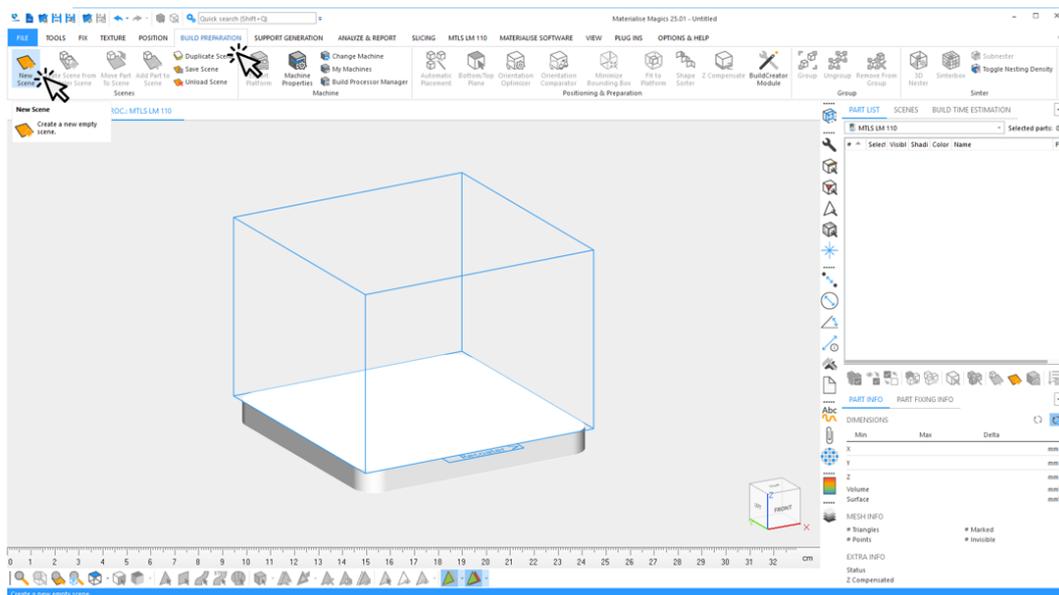
This tutorial describes the job-to-be-done of a user for preparing the dental platform in case there is a remaining area on the platform where other dental parts could be placed after the first pass.

1. Create new build job file:

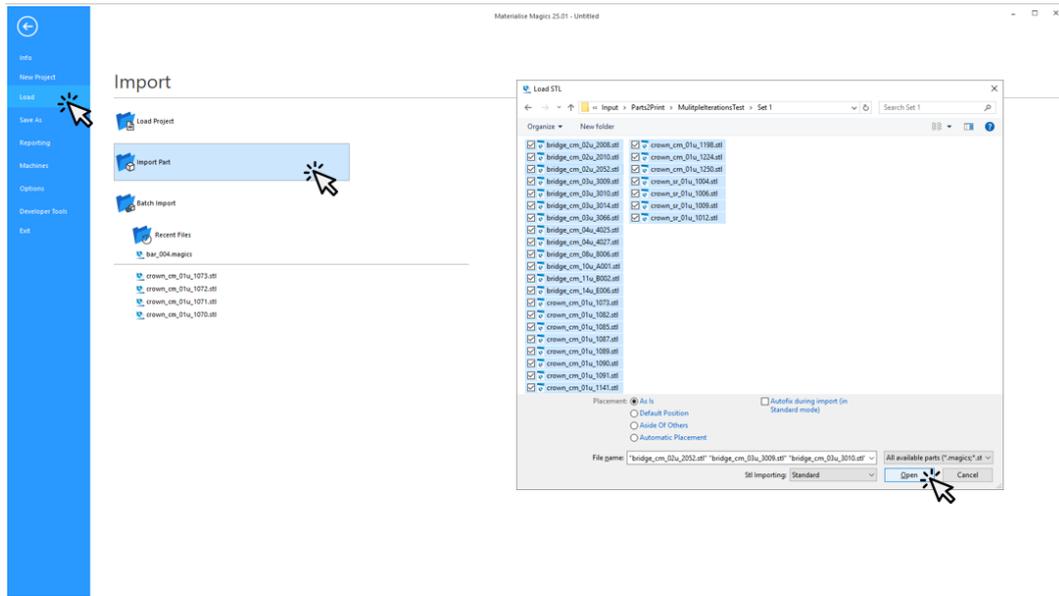
Start Magics RD or Magics Print.



2. Create scene for specific BP machine:



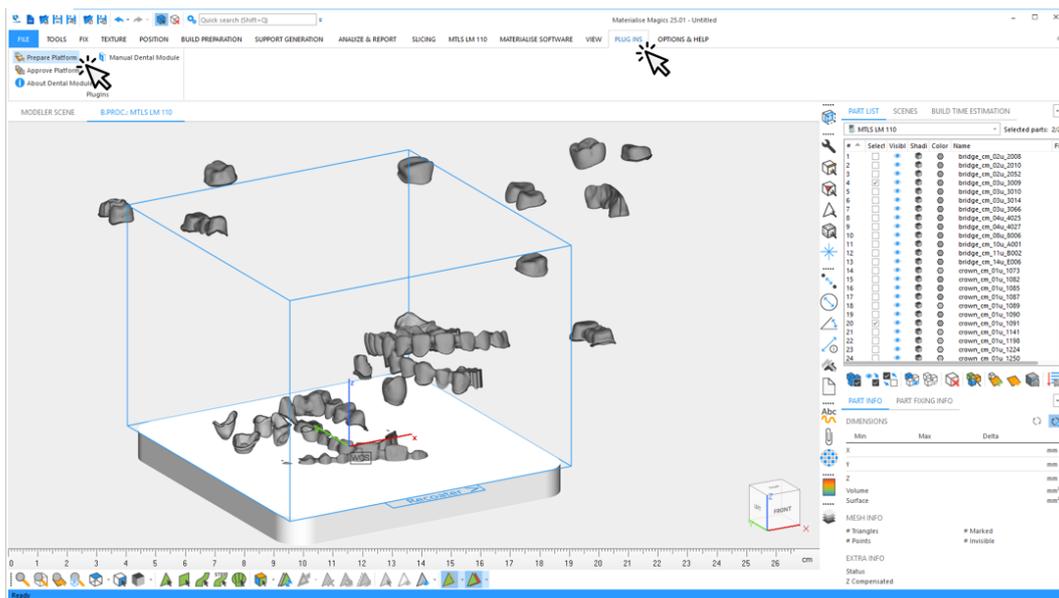
3. Select all dental parts to used for the next build job:



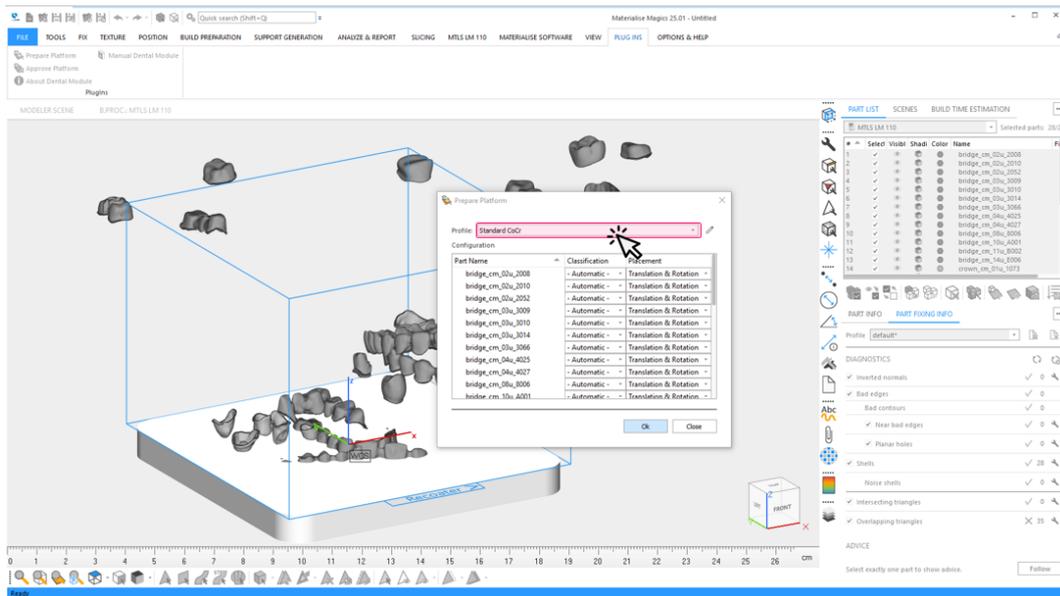
Click **Open**. All dental parts to be built are imported.

4. Start the process of creating the dental build platform:

Click **Prepare Platform**.



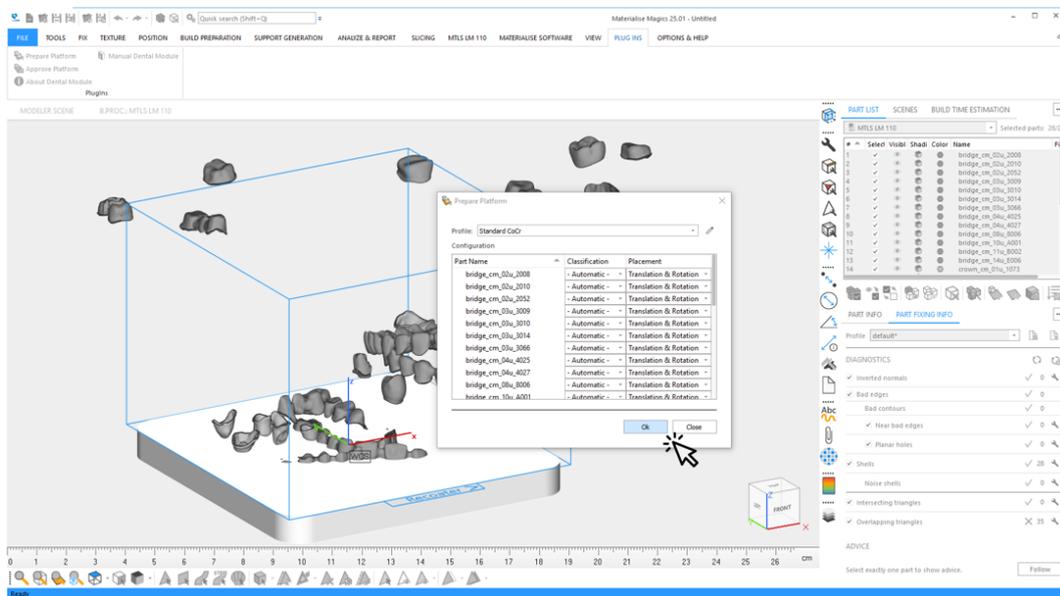
5. Select profile to be used for automated data preparation.



In this example, only dental parts supported by the dental module are loaded. Therefore, there is no need to manually change the default option for **Classification** and **Placement**.

6. Start automatic creation of the dental platform:

Click **Ok**.

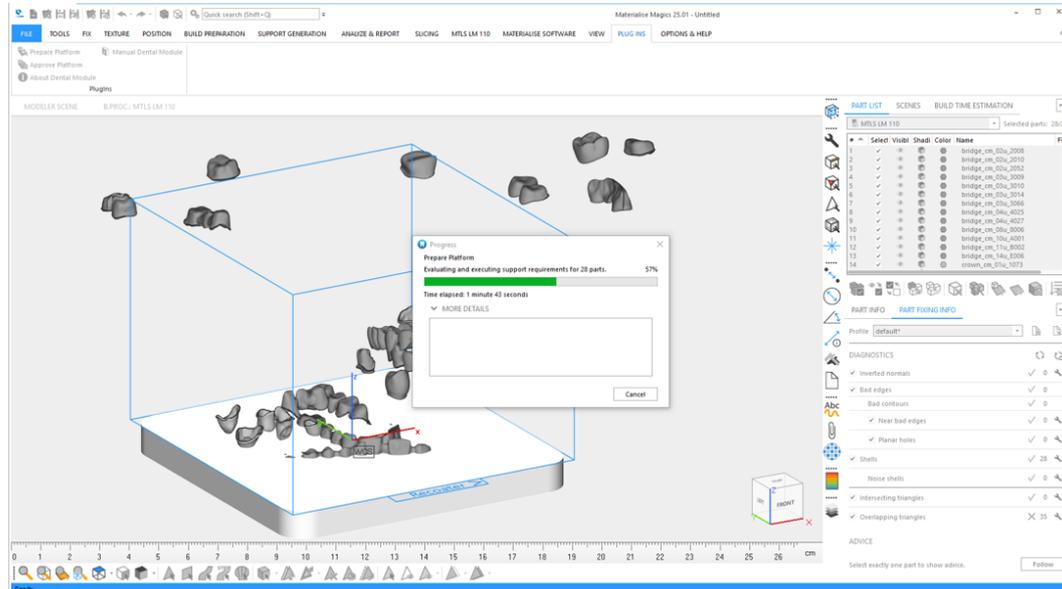


7. During automatic creation, you will see information about:

- current processing step and the overall progress
- events such as warnings or errors

Typical warning: uncertain classification of part type.

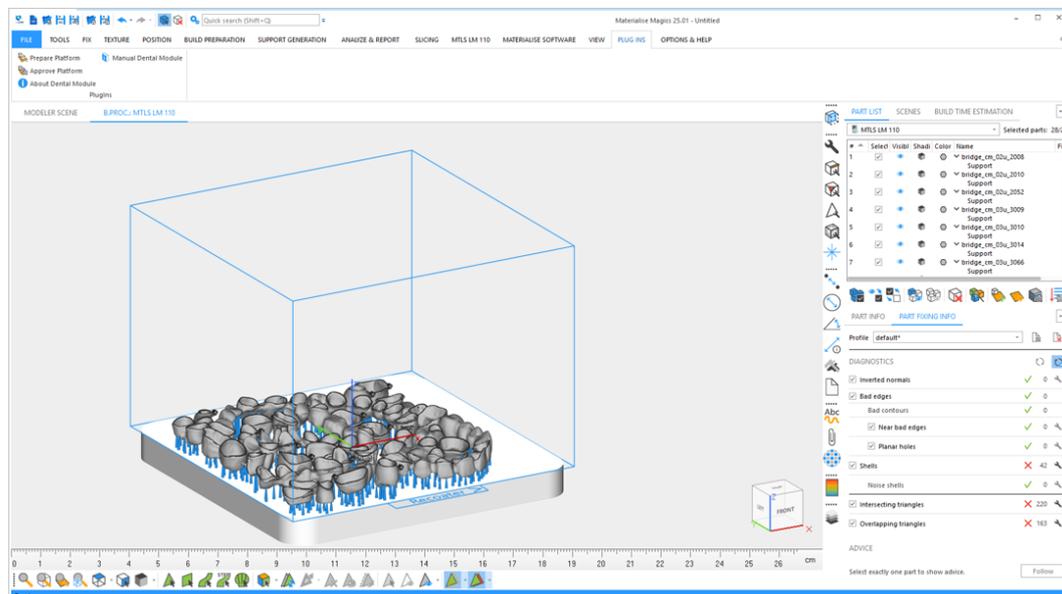
Typical error: failure to fix part so that part is excluded from further processing.



☰ Typical Warning Messages on page 64

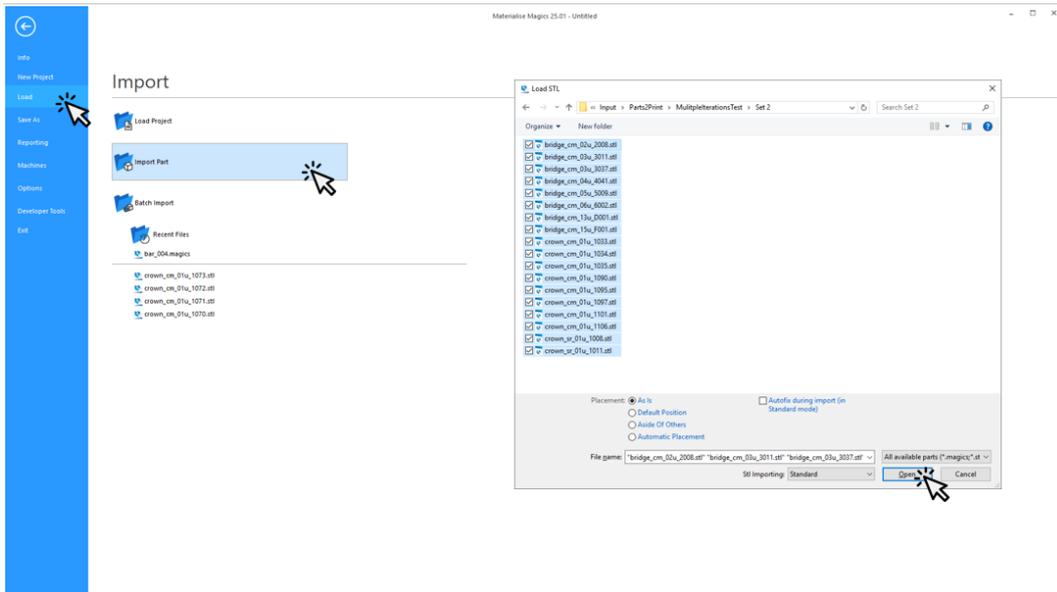
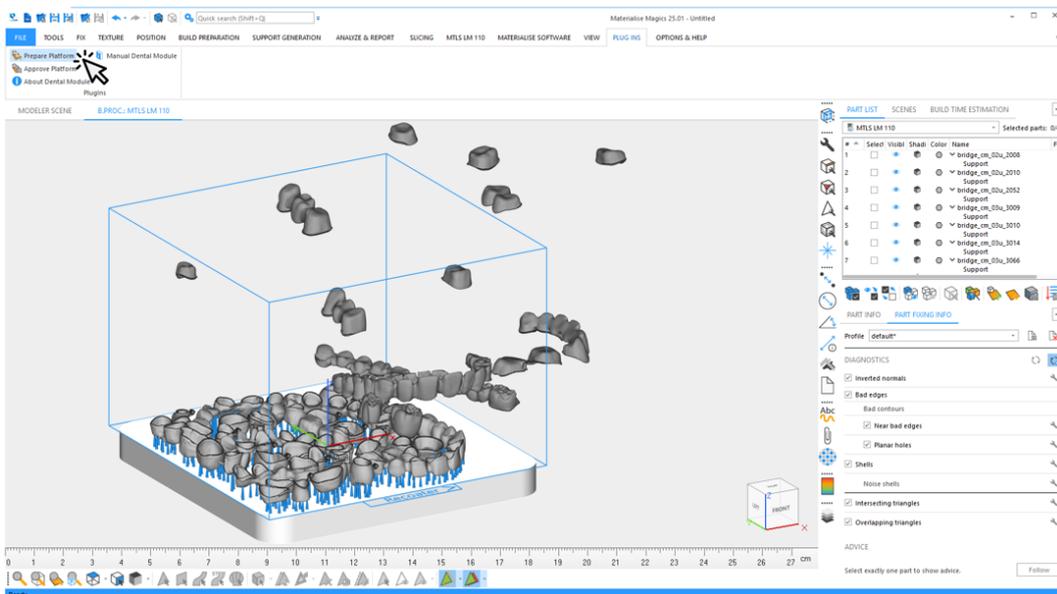
☰ Log Files from Platform Preparation on page 25

8. View results of Dental Module in Magics:

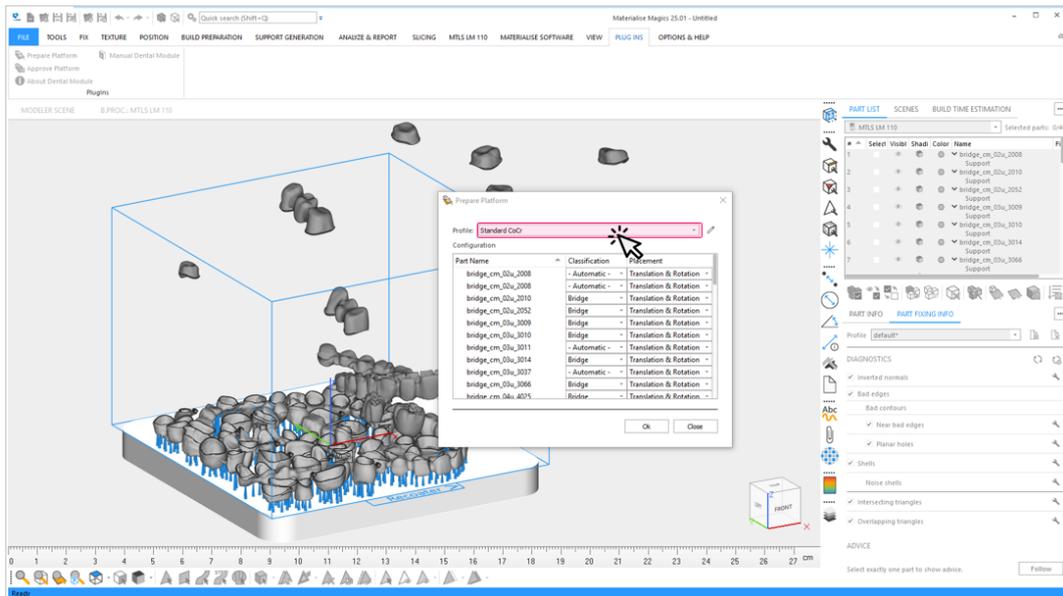


You notice that there is a remaining area on the platform where other dental parts could be placed. Or you deleted some parts placed on the building platform and cannot use any non-placed parts as replacements.

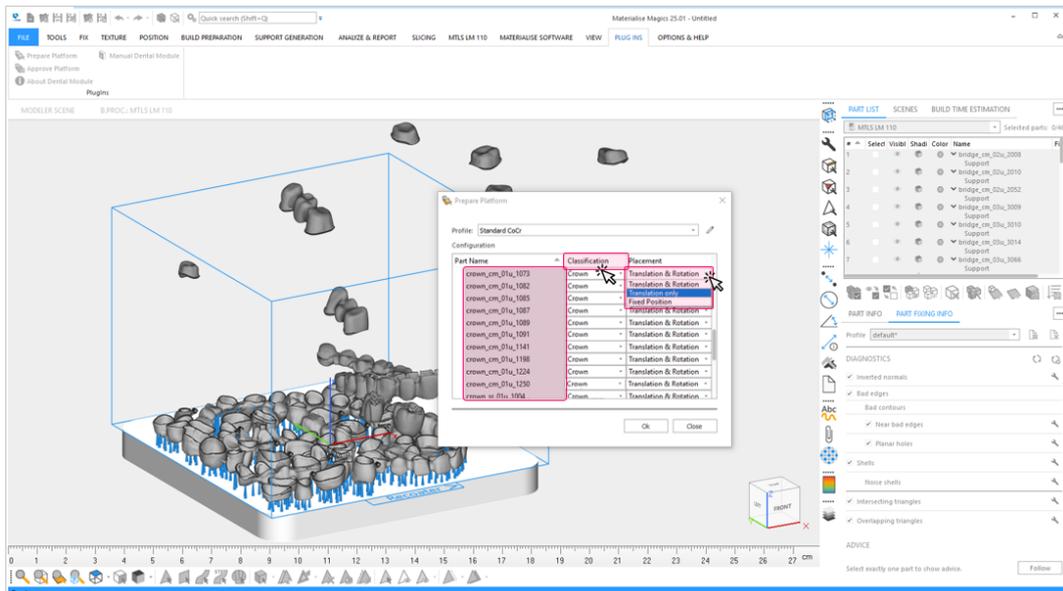
9. Select additional parts to completely fill the platform in a second pass.

10. Start the dental module a second time by clicking on **Prepare Platform**.

11. Select the profile to be used for automated data preparation.

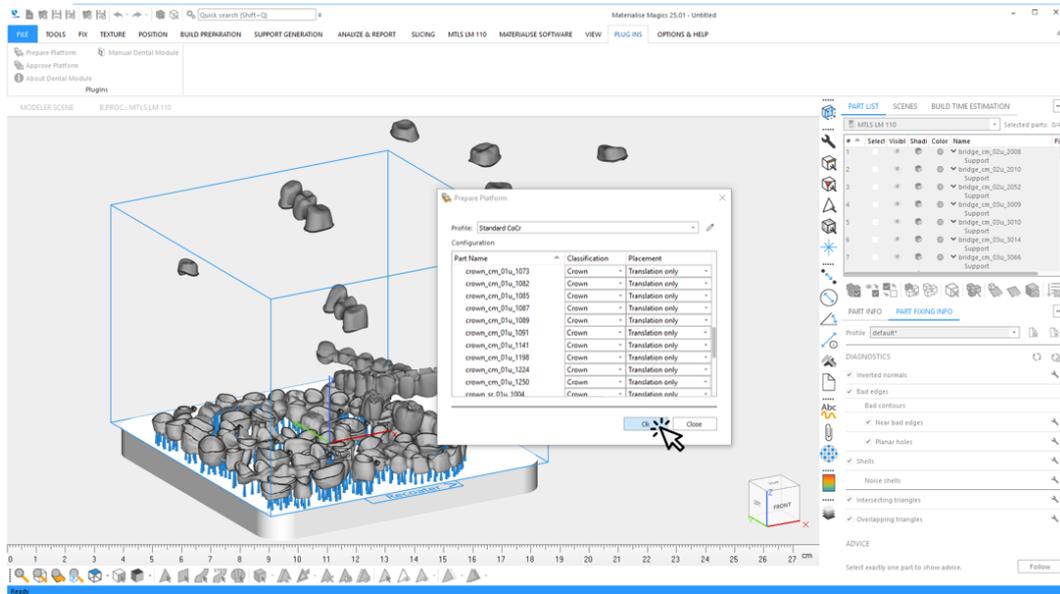
12. In this example, the crowns have received a label that is aligned in the direction of the recoater. To maintain their alignment, you need to set **Placement** to **Translation only** for all parts classified as **Crown**. You have the following options to select multiple parts classified as **Crown**:

- Sort all parts according to their classes by clicking on **Classification** and select all parts from the type **Crown** with your mouse. The corresponding classes were determined automatically in the first run.
- Alternatively, you can make the multiple selection of the labeled crowns via “CTRL” button and mouse click on the part name.

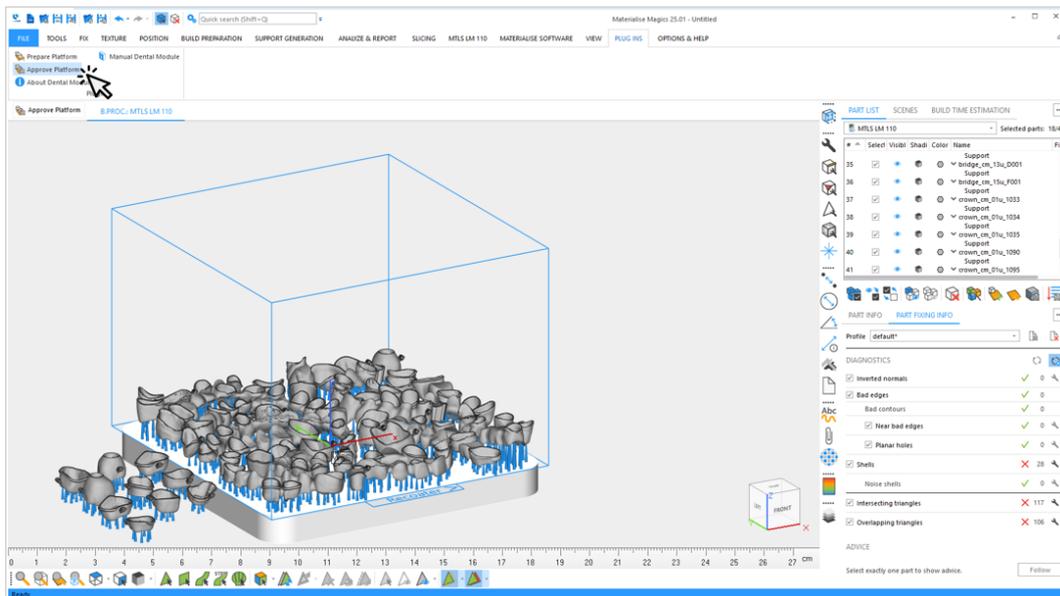


After selecting all crowns, select the placement option **Translate only** for one of the selected parts. The option is applied to all selected parts.

13. Click **OK** to start the second iteration of the automatic creation of the dental platform.

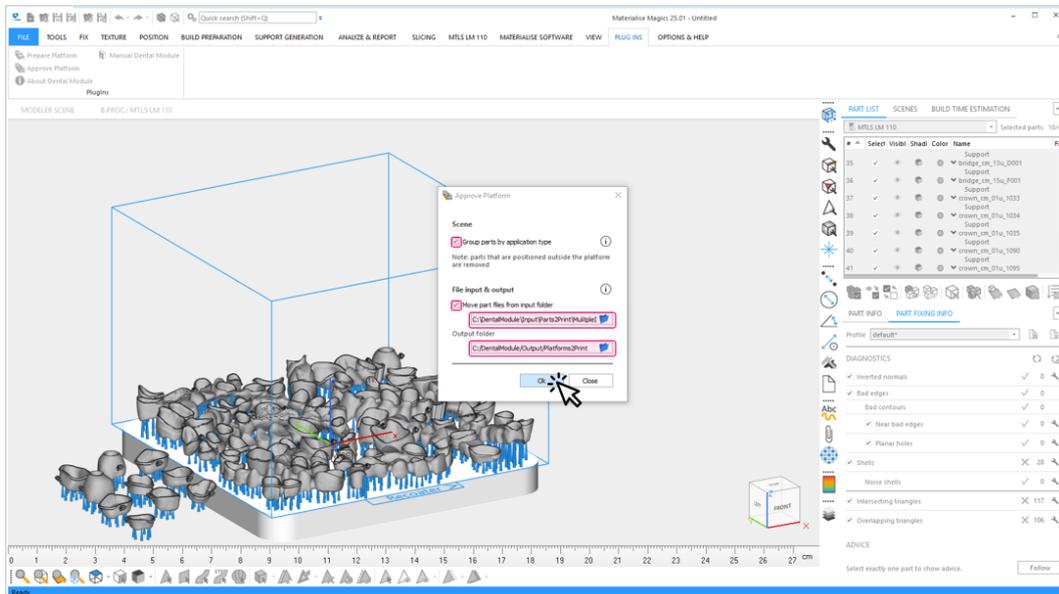


14. View the result of the dental module in Magics. In this example, new parts were successfully placed in the remaining area.

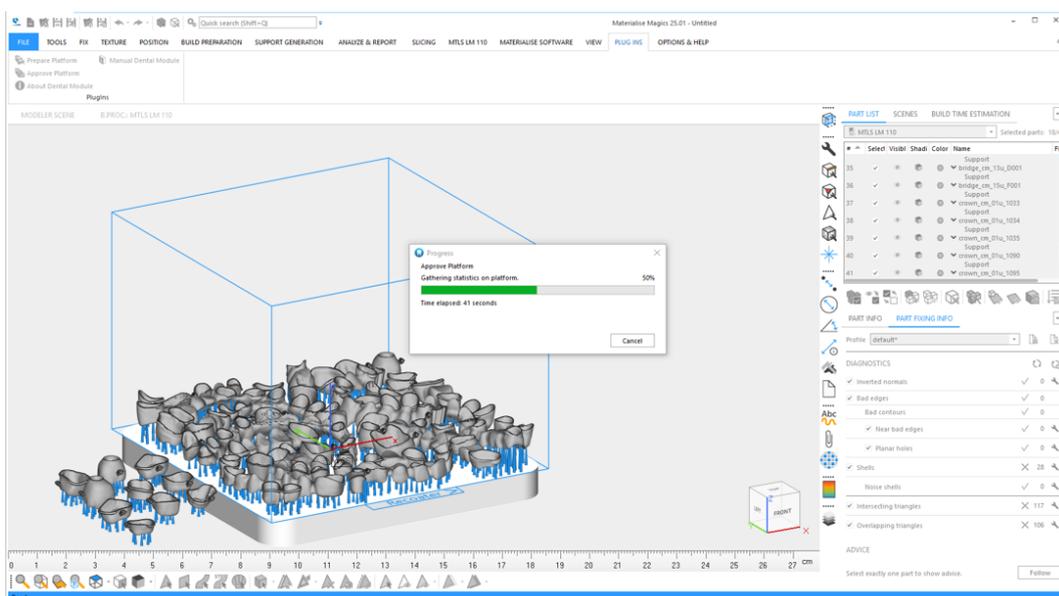


The platform is now ready to be approved and to be processed by the Build Processor. Click **Approve Platform**.

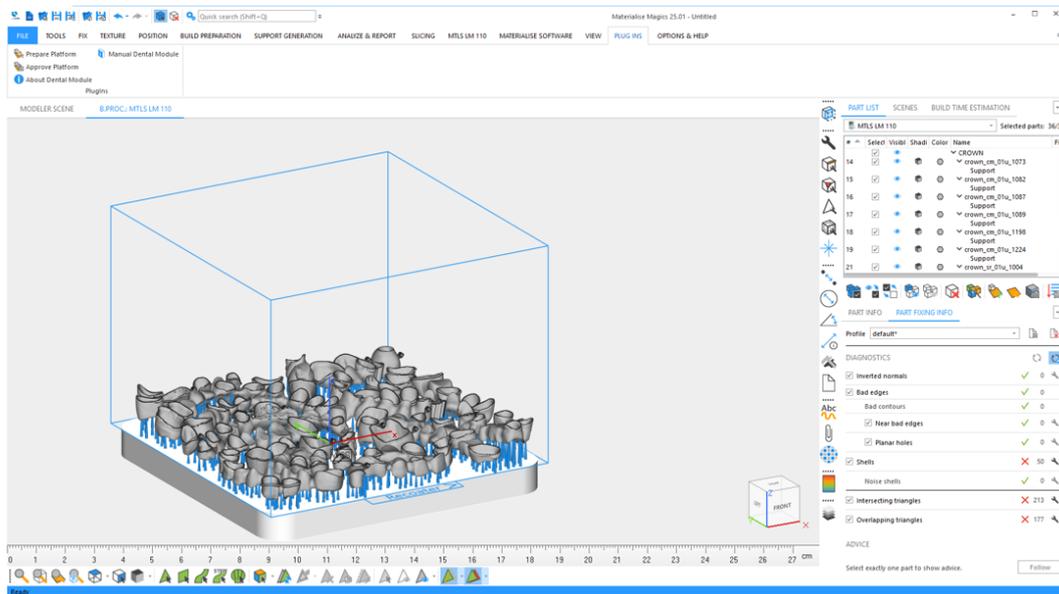
15. The approval process of the Dental Platform performs the following steps:



1. Remove all parts (and their supports) from scene if they are not **COMPLETELY** on the build platform.
 2. (Optional) Move all STL data from dental parts on the platform from input folder into subfolder Source Data in output folder.
 3. Save platform in time-stamped subfolder of output folder.
 4. (Optional) Group all parts of same type including their supports into one group.
 5. Generate report and save it in subfolder of output folder.
16. During automatic preparation, you will see information about:
- current approval steps and overall progress
 - events such as warnings or errors
- Typical warning: file could not be moved.

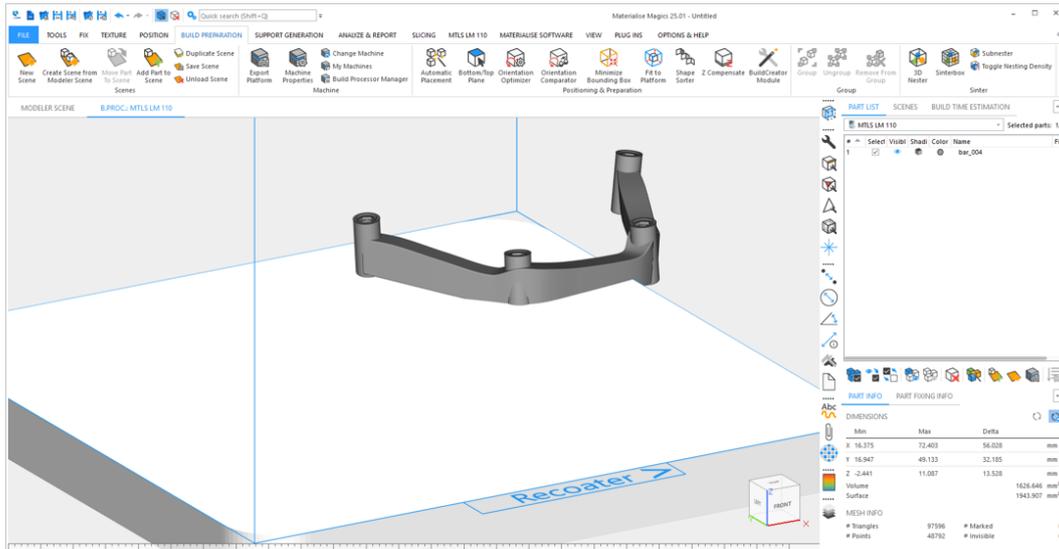


17. Approved dental platform in Magics is ready:
Click **Close** to leave dialog.
18. Platform is ready to be processed by the Build Processor:
 - All parts outside of the platform have been removed.
 - (Optional) Parts are grouped according to their type.

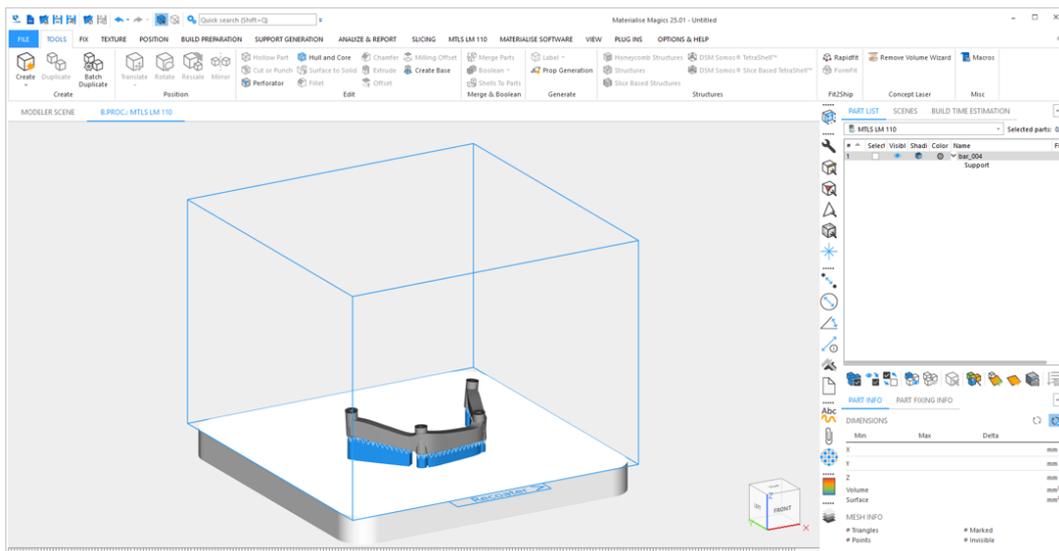


See *Tutorial: Getting Started* on page 66 to get more information about the platform approval and job file generation.

- Load the dental part(s) to be built, which are not supported by the automatic data preparation of the dental module.



- Prepare the non-supported dental part(s) by using fixing, positioning and support generation tools in Magics. In the end, the part(s) need to be supported and placed successfully on the platform.

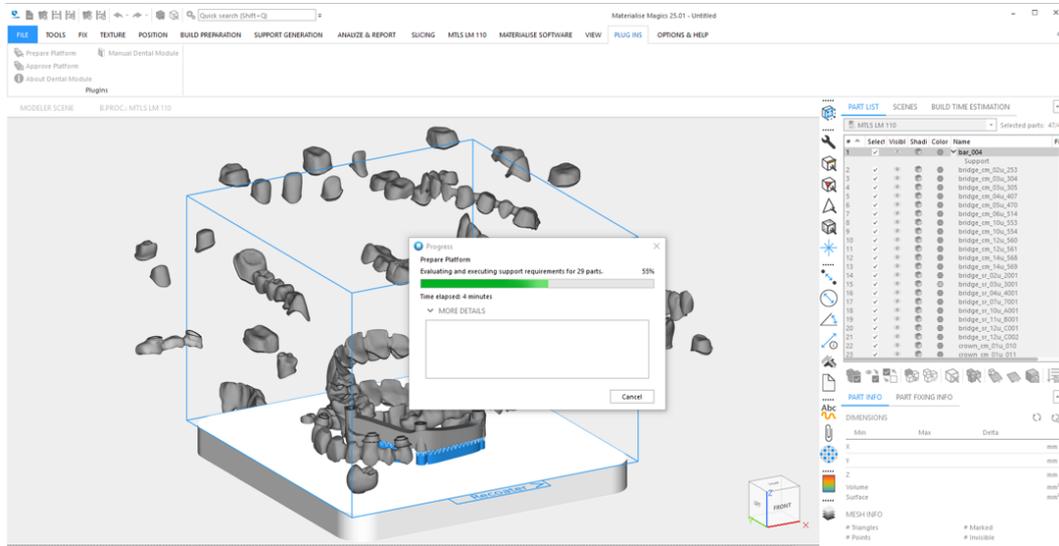


7. During automatic creation, you will see information about:

- current processing step and the overall progress
- events such as warnings or errors

Typical warning: uncertain classification of part type.

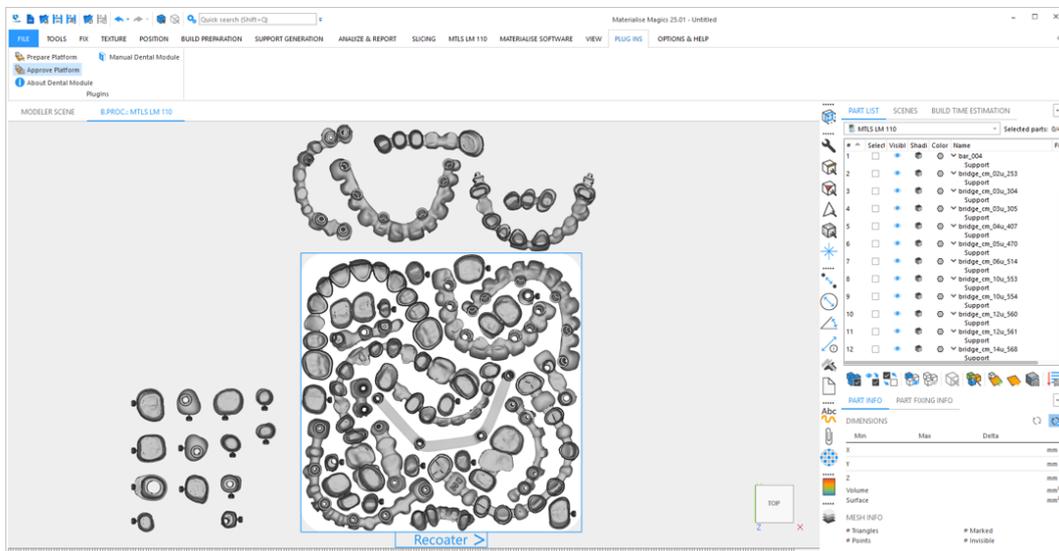
Typical error: failure to fix part so that part is excluded from further processing.



☰ Typical Warning Messages on page 64

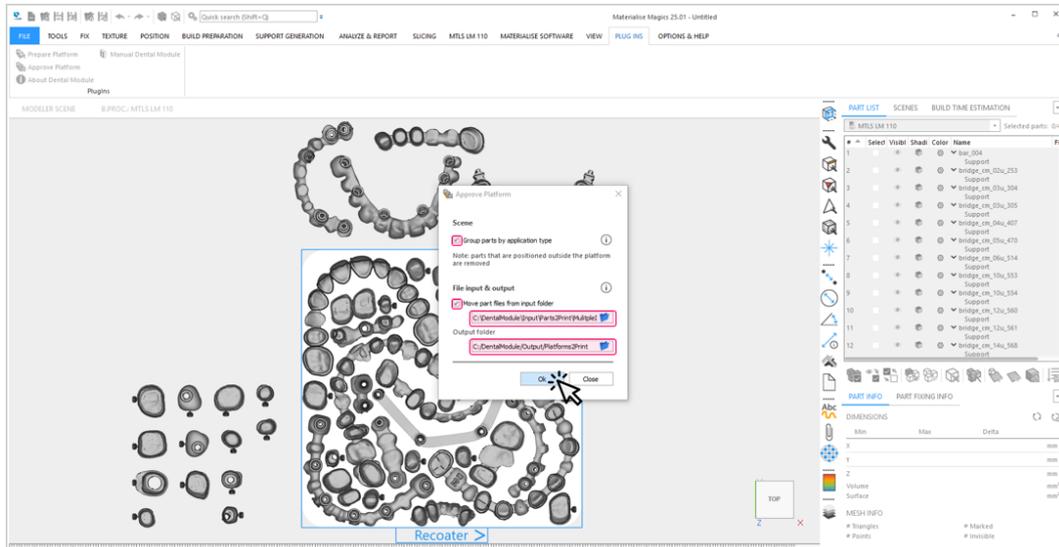
☰ Log Files from Platform Preparation on page 25

8. View results of Dental Module in Magics:

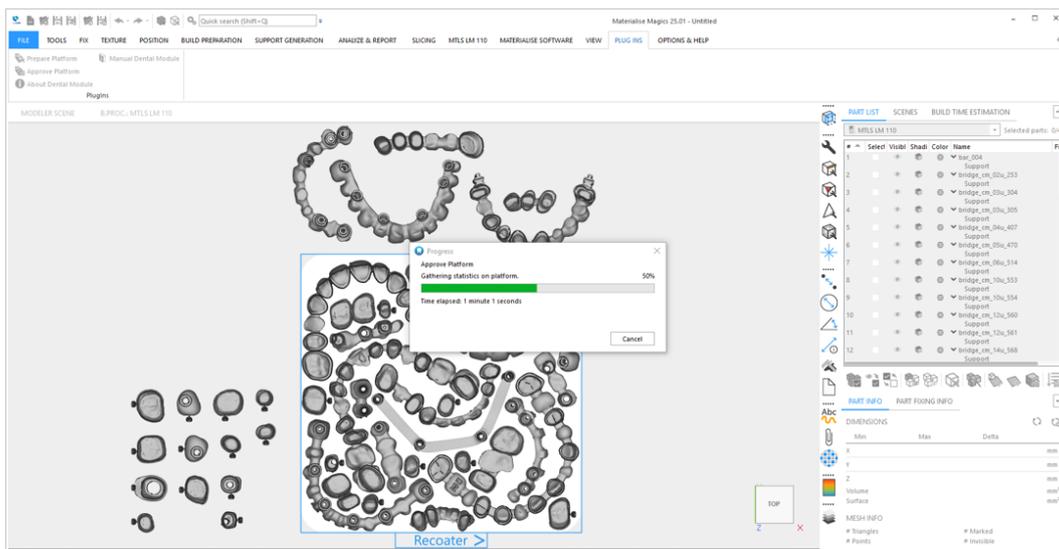


Inspect the created result of the dental module. If you see no way to place more parts on the platform by manually repositioning parts, the platform is ready to be approved and to be processed by the Build Processor. Click **Approve Platform**.

9. The approval process of the Dental Platform performs the following steps:

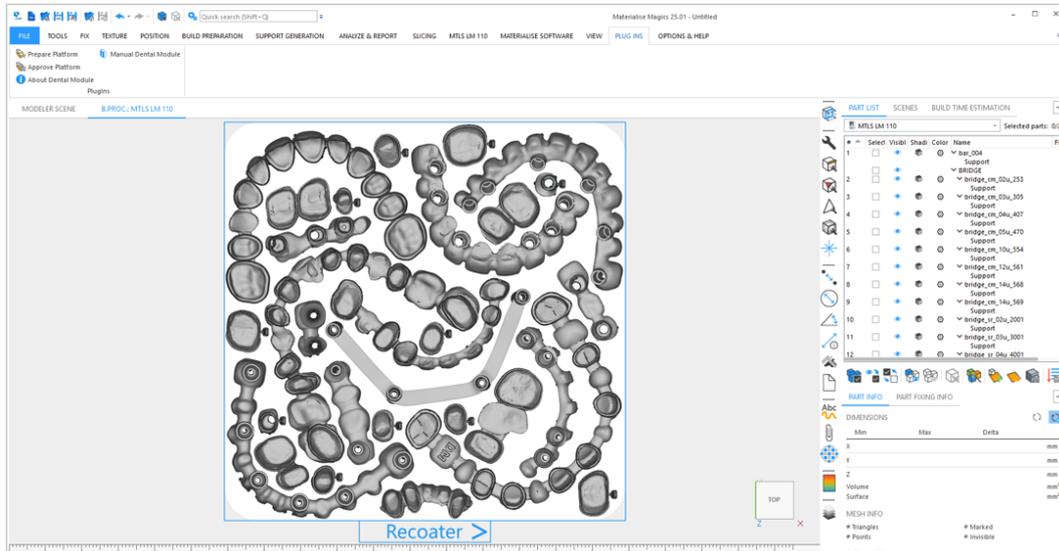


1. Remove all parts (and their supports) from scene if they are not COMPLETELY on the build platform.
 2. (Optional) Move all STL data from dental parts on the platform from input folder into subfolder Source Data in output folder.
 3. Save platform in time-stamped subfolder of output folder.
 4. (Optional) Group all parts of same type including their supports into one group.
 5. Generate report and save it in subfolder of output folder.
10. During automatic preparation, you will see information about:
- current approval steps and overall progress
 - events such as warnings or errors
- Typical warning: file could not be moved.



11. Approved dental platform in Magics is ready:
Click **Close** to leave dialog.

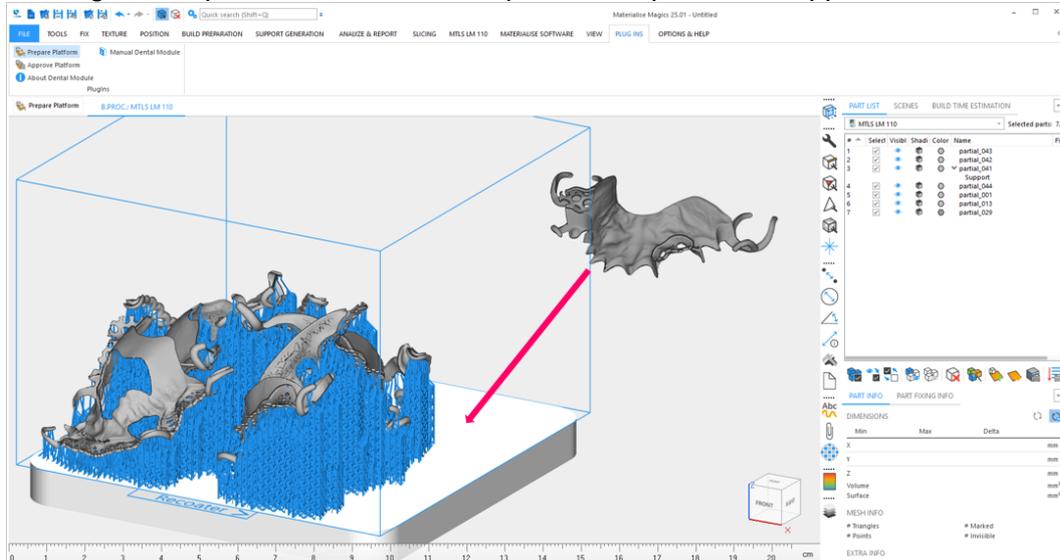
12. Platform is ready to be processed by the Build Processor:
- All parts outside of the platform have been removed.
 - (Optional) Parts are grouped according to their type.



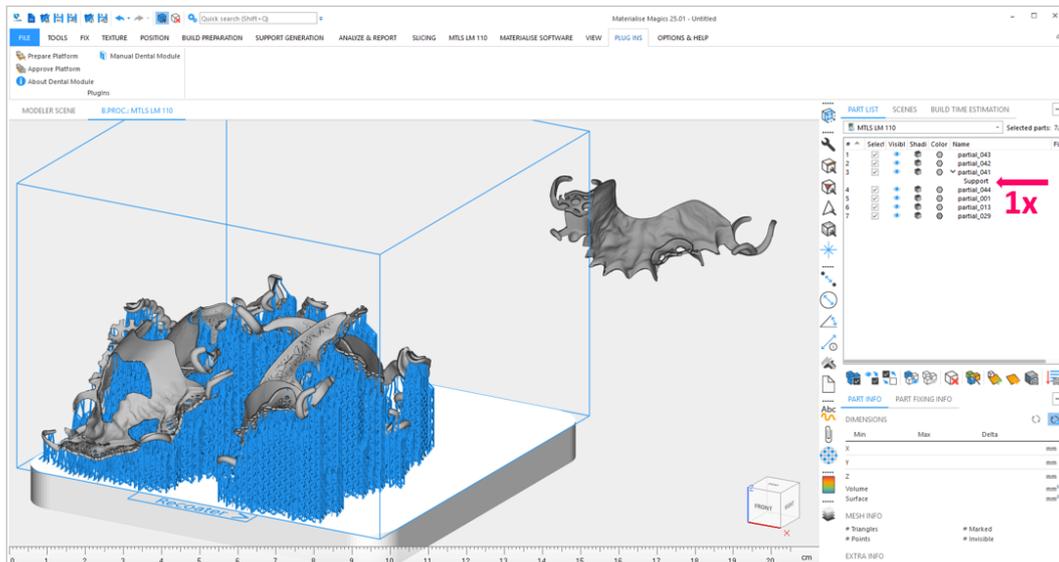
See *Tutorial: Getting Started* on page 66 to get more information about the platform approval and job file generation.

10.5. Tutorial: Adding New Parts to an Existing Platform with a Scaffold Support

This tutorial describes the job-to-be-done of a user who wants to place additional parts to an existing dental platform, on which the processed parts are supported with a scaffold support.



A scaffold support is always created cross-platform. It is assigned to only one component, thus it prevents a subdivision to the different parts.



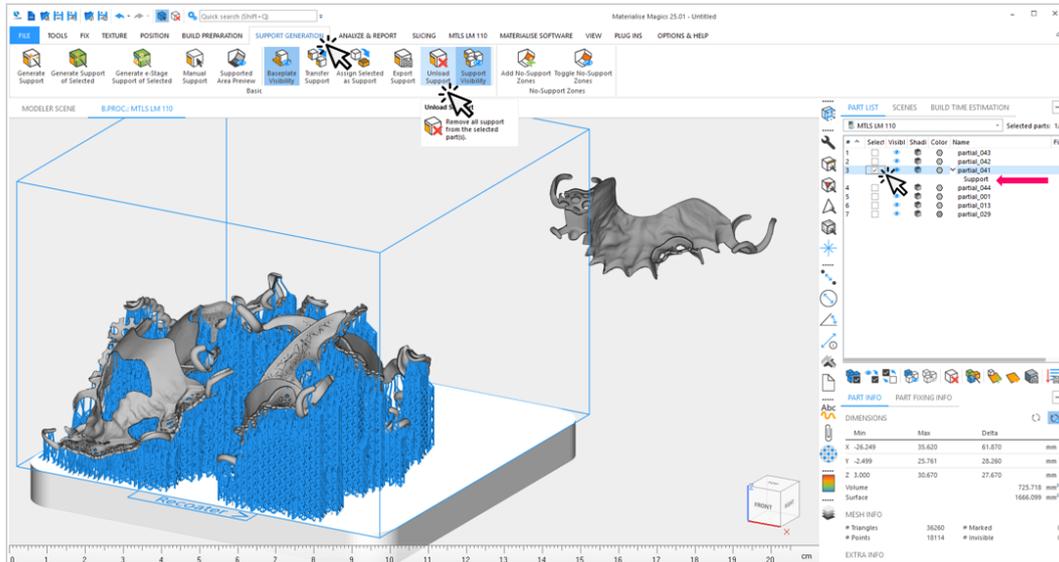
When adding new parts to an existing dental platform with a scaffold support, there are two possible scenarios:

Scenario 1: At least one added part should also receive scaffold support

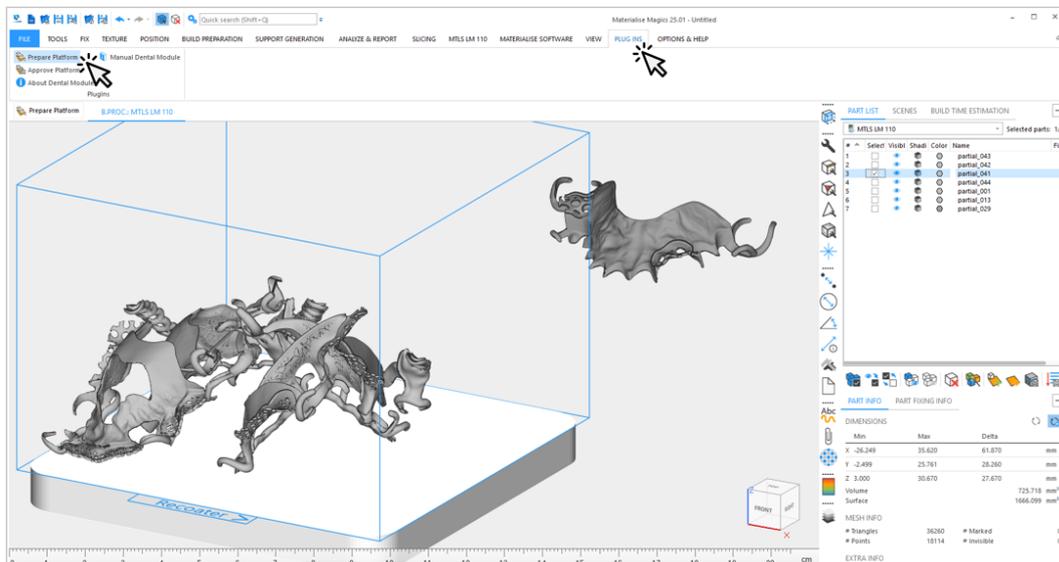
Scenario 2: None of the added parts should receive scaffold support

Scenario 1: At least one added part should also receive scaffold support:

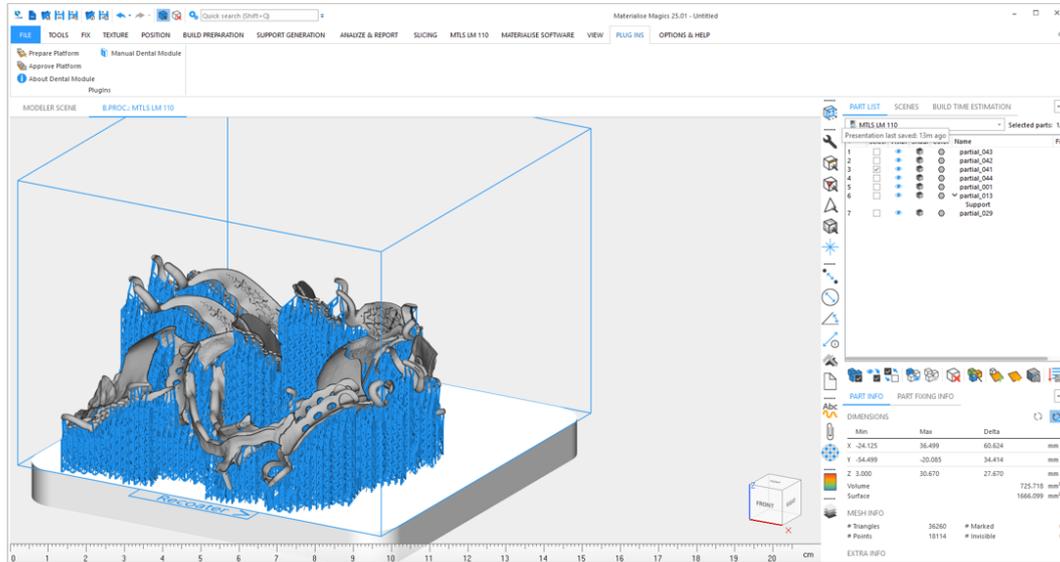
1. After importing the additional part(s), delete the scaffold support of the existing platform: Select the part in Magics to which the scaffold support has been assigned. Delete the support by using the **Unload Support** function in the menu entry **Support Generation**.



2. Click **Prepare Platform** to arrange and create the new configuration for your parts.



- View the result in Magics. The dental module created a new platform-wide scaffold support for the existing and the new parts that were set to receive a scaffold support on the platform.



See *Tutorial: Getting Started* on page 66 to get more information about the platform preparation, platform approval and job file generation.

Scenario 2: None of the added parts should receive scaffold support

There are two options depending on whether you want to keep the already-created scaffold support:

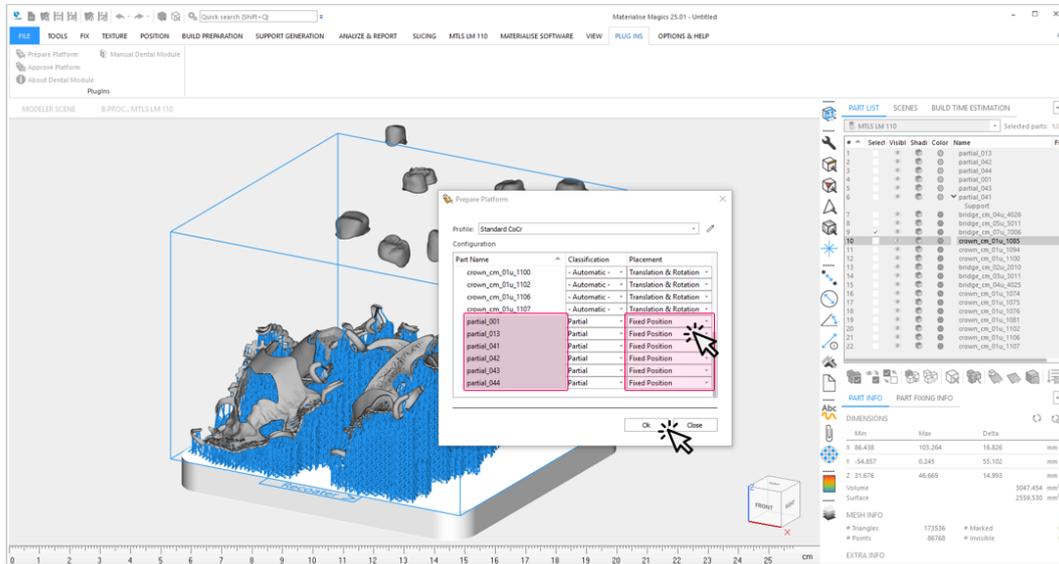
Option 1: You want to keep the already-created scaffold support and thus the given arrangement of the scaffold supported parts on the platform.



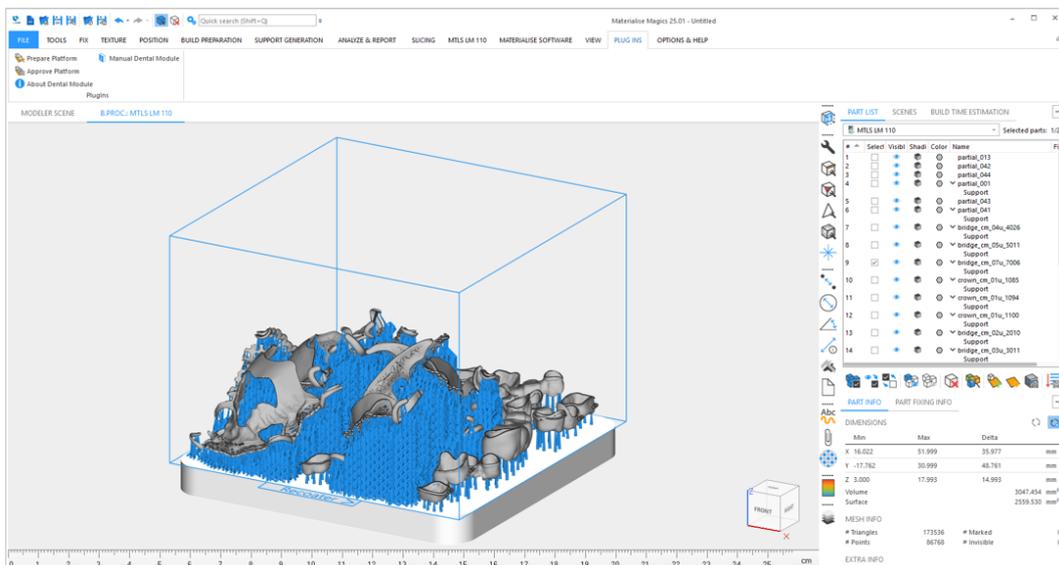
The advantage of this option is that scaffold support can be reused, thus reducing the time needed to rebuild the platform.

The disadvantage of this option is that the given arrangement of the scaffold supported parts is adopted and therefore no better one can be created.

1. After importing the additional parts and clicking **Prepare Platform**, set **Fixed Orientation** as **Placement** for all parts receiving scaffold support. Click **OK** to create your new configuration.



2. View the result in Magics. The dental module created a platform on which the parts supported by scaffold are taken over unchanged. The added parts are positioned around the scaffold supported parts.

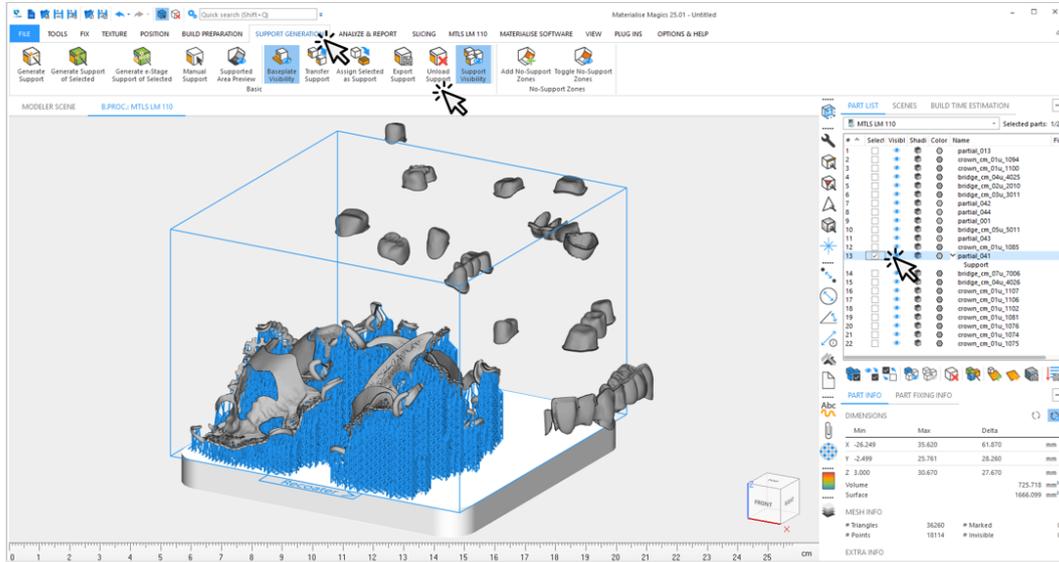


See *Tutorial: Getting Started* on page 66 to get more information about the platform preparation, platform approval and job file generation.

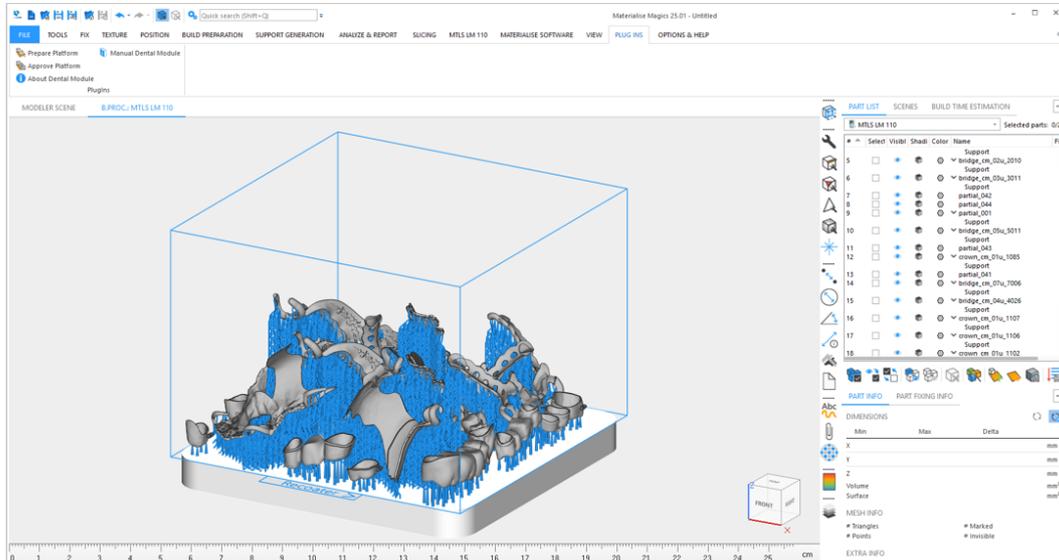
Option 2: You want to delete the already-created scaffold support to achieve an optimal placement of all parts on the platform.

1. After importing the additional part(s), select the part in Magics to which the scaffold support has been assigned.

Delete the support by using the **Unload Support** function in the menu entry **Support Generation**.



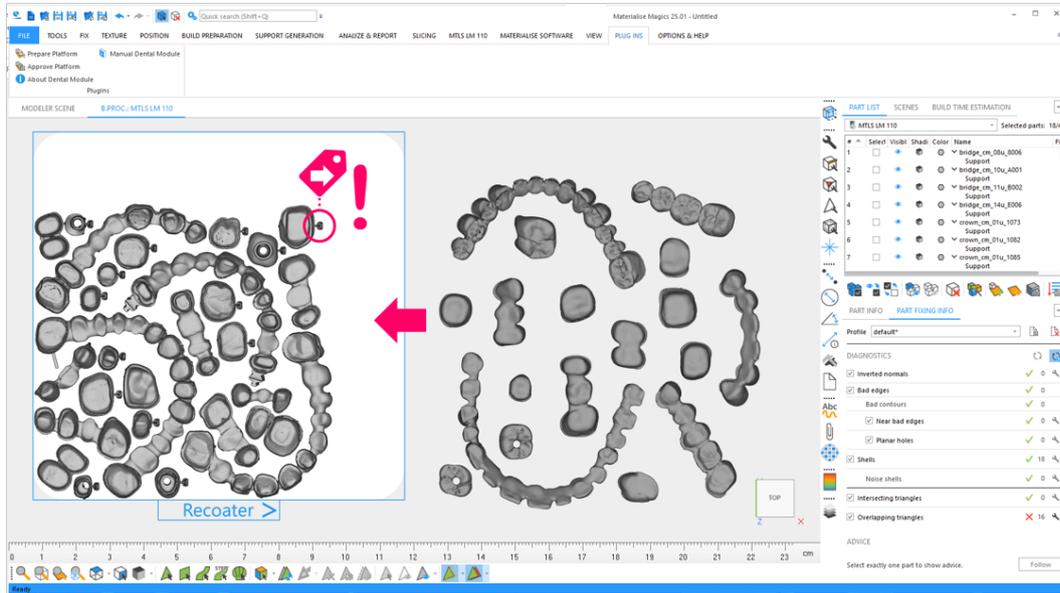
2. Arrange and create the new configuration for your parts via **Prepare Platform**. (REF)
3. View the result in Magics. The dental module created a new platform-wide scaffold support for the existing and the new parts that were set to receive a scaffold support on the platform. All remaining parts are provided with support of the assigned type.



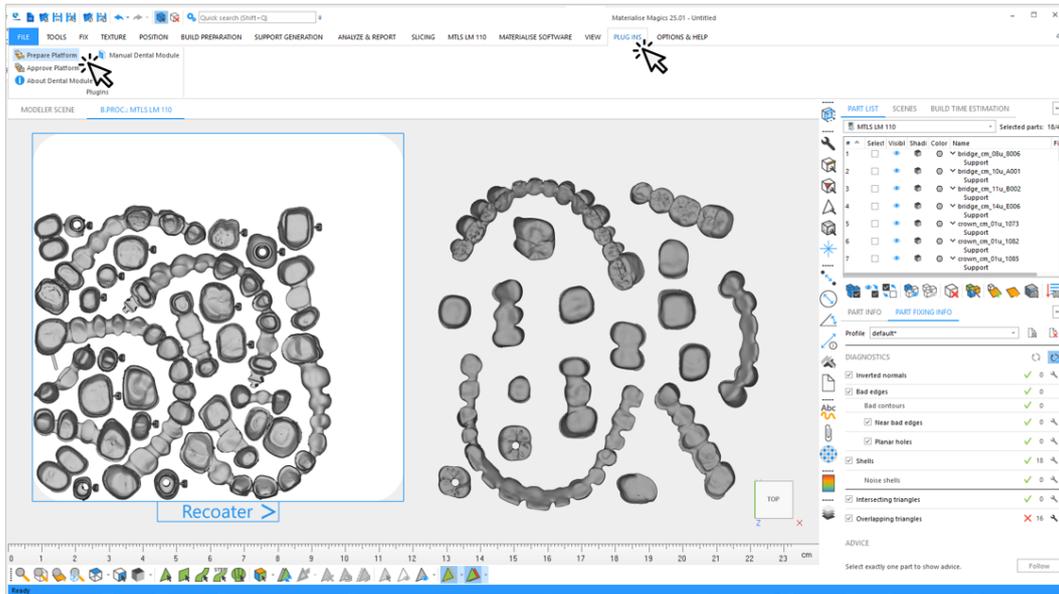
See *Tutorial: Getting Started* on page 66 to get more information about the platform preparation, platform approval and job file generation.

10.6. Tutorial: Adding Parts to a Platform Containing Parts with Directed Labels

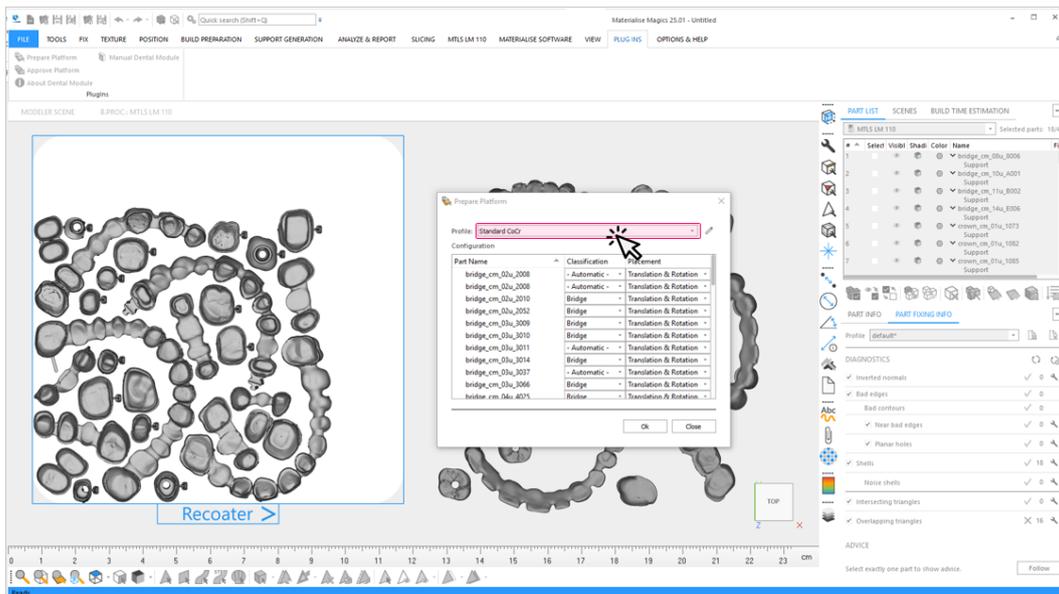
This tutorial describes the job-to-be-done of a user who wants to place additional parts to an existing dental platform, on which there are parts with directed labels. The user's goal is to maintain the alignment of the directed labels in a second iteration.



1. Click **Prepare Platform** after importing all the new parts you want to add to the platform.

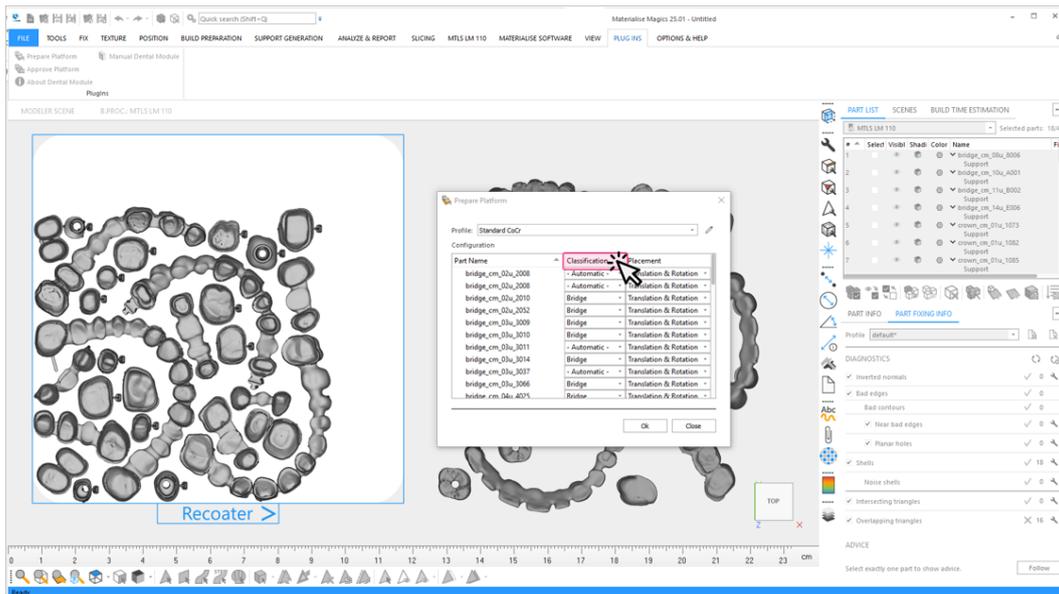


2. Select profile to be used for automated data preparation.

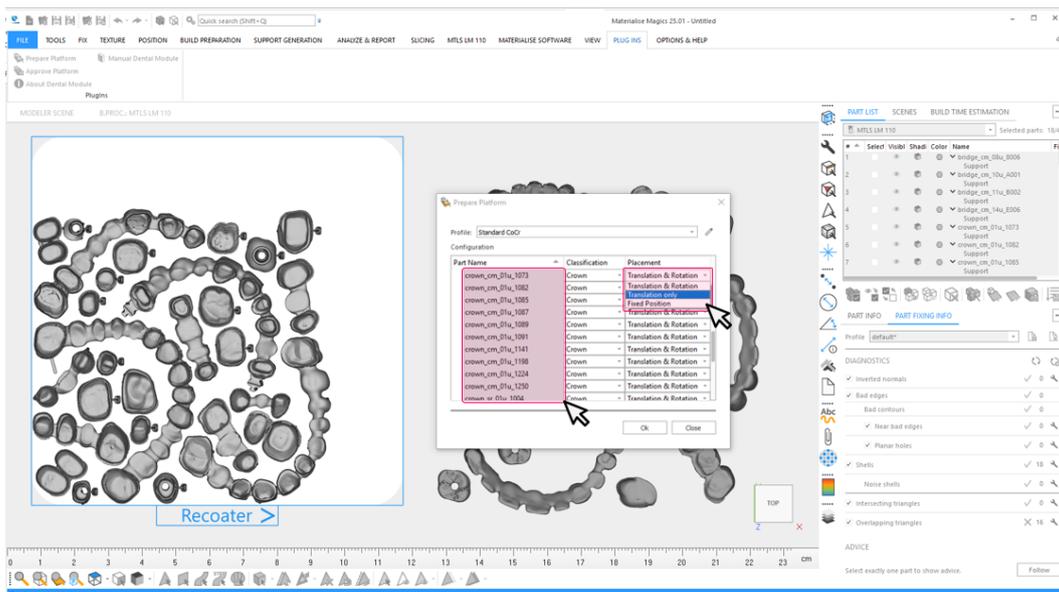


3. In this example, the crowns have received a label that is aligned in the direction of the recoater. To maintain their alignment, you need to set **Placement** to **Translation only** for all parts classified as **Crown**. You have the following options to select multiple parts classified as **Crown**:

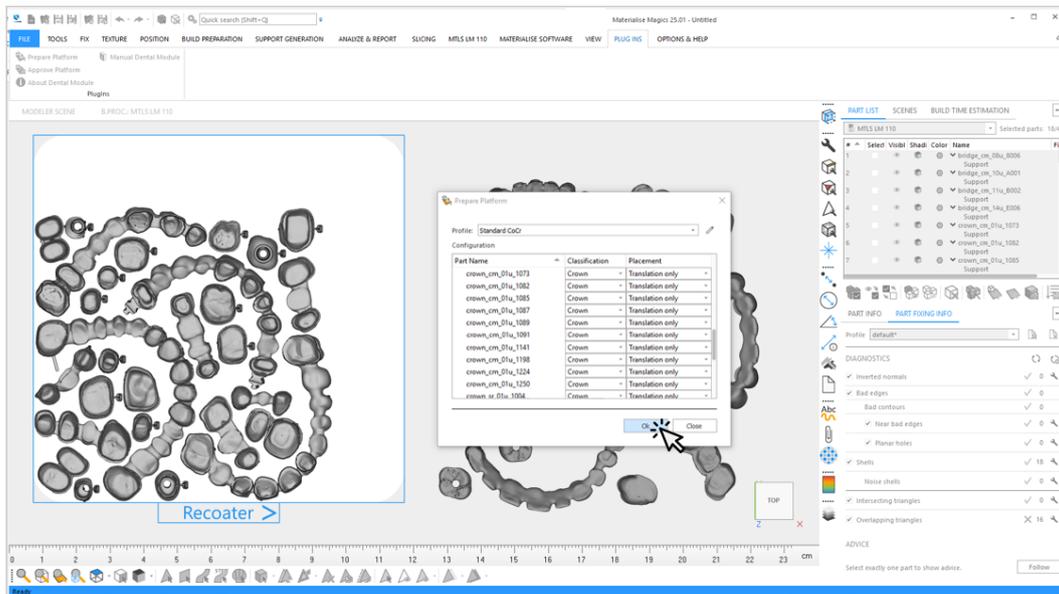
- Sort all parts according to their classes by clicking on **Classification** and select all parts from the type **Crown** with your mouse. The corresponding classes were determined automatically in the first run.
- Alternatively, you can make the multiple selection of the labeled crowns via “CTRL” button and mouse click on the part name.



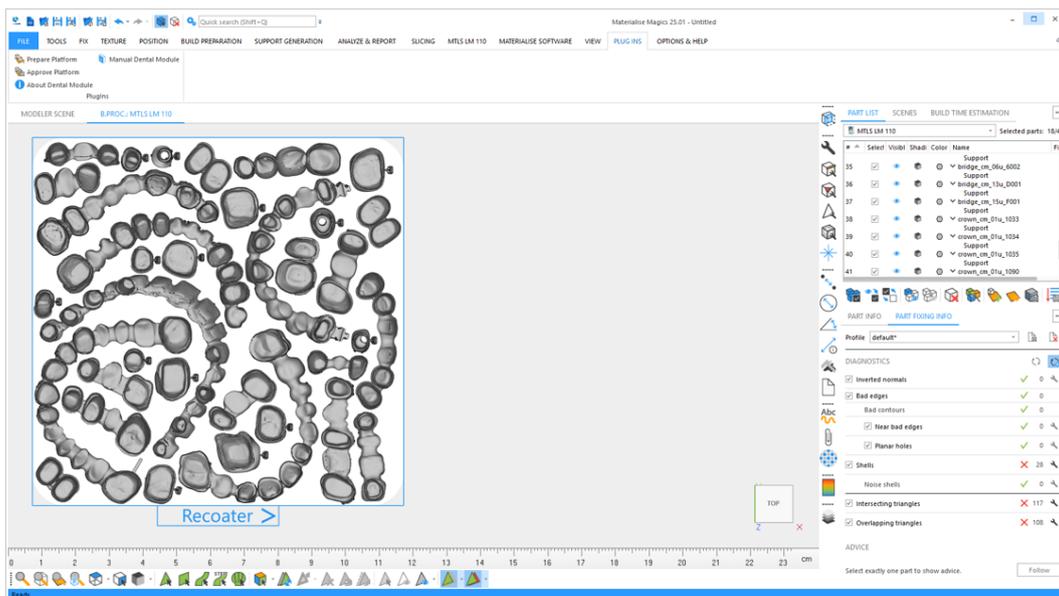
4. After selecting all crowns, select the placement option **Translate only** for one of the selected parts. The option is applied to all selected parts.



5. Click **OK** to start the automatic preparation of the dental platform.



6. View the result of the dental module in Magics. In this example, all parts could be placed correctly on the platform in the second pass.



The platform is now ready to be approved and to be processed by the Build Processor.

See *Tutorial: Getting Started* on page 66 to get more information about the platform approval and job file generation.

10.7. Tutorial: Using Regular Expressions to Create Label Texts

File names may already contain valuable information regarding your dental designs. If the file names are always structured in a certain way you might wish to extract alpha-numeric subsets from the file name to be used as label text. This can be done using regular expressions.



Labels must be enabled for a part type and **Auto-numbering** must be disabled in order for regular expressions to work.

10.7.1 Prerequisites for Regular Expressions

A regular expression will parse your file name and filter out the alpha-numeric string exactly according to the definition. In order to be able to extract a string from the part name, the regular expression must meet three criteria:

1. Correct template: The regular expression must correctly describe the complete structure of the file name.

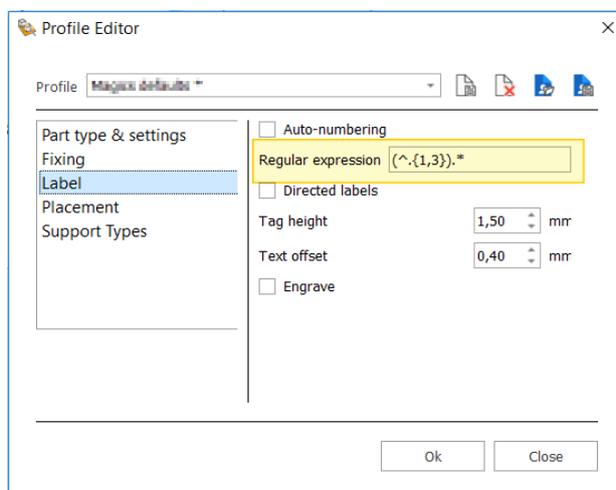


You must make sure that your files names are always composed exactly the same way.

2. Correct filter: The regular expression must correctly describe the sub-structure of the file name to be extracted.
3. Correct position: The filter term must be at the correct position within the template term to be able to extract
- 4.

10.7.2 Ready-to-use Regular Expressions for the Dental Module

In this section you will find several regular expressions that can be used directly in the Dental Module. Simply paste the listed expressions into the **Regular expression** field in the in the **Label** section of the Profile Editor.





First three (or less if less available) characters of a filename

Regular expression: **(^{1,3}).***

Example file name: 27125_20201123_13A_0

Extracted label text: 271

Last three (or less if less available) characters of a filename

Regular expression: **.*?(\{1,3\}\$)**

Example file name: 000440940101_A-9

Extracted label text: A-9

4 digits after a coded underscore somewhere in a filename

Regular expression: **.*_t([0-9]{4}).***

Example file name: 20210426_t5030-U_0

Extracted label text: 5030

3 alphanumeric characters after the second last underscore somewhere in a filename

Regular expression: **.*_([a-zA-Z0-9]{3})_[^_]*\$**

Example file name: SJZ613_BRI_069_U

Extracted label text: 069

Last three digits of the first alphanumeric sequence delimited by an underscore

Regular expression: **^[a-zA-Z0-9]*([0-9]{3})_.***

Example file name: SJZ613_BRI_069_U

Extracted label text: 613

Last three digits of the first numeric 7 digit sequence delimited by a dash/minus sign

Regular expression: **^[0-9]{4}([0-9]{3})-.***

Example file name: 2275751-10028_B751

Extracted label text: 751

10.7.3 Overview of Rules for Regular Expressions

The following rules apply to the creation of regular expressions. This is just a very small excerpt of possible rules. Check the internet for more information on regular expressions and more detailed tutorials.

Character(s)	Description
.	any character
[abc]	a, b or c, (simple character set)
[^abc]	Everything except a, b or c (negation)
[a-z]	a to z or A to Z (simple character range)
[a-d[n-p]]	a to d or n to p; identical with [a-dn-p] (union)
[a-z&&[^bc]]	a to z, without b and without c (character range with exclusion)
^	Start of a character string
\$	End of a character string
X?	X exactly once or not at all
X*	X 0-times to many
X+	X 1-time to many
X{n}	X exactly n-times
X{n,}	X at least n-times to many
X{n,m}	X n to m-times
X*?	X 0-times to as little as possible
X+?	X 1 time to as little as possible
X{n,}??	X at least n-times to as little as possible
X{n,m}??	X at least n-times up to highest m-times
XY	X followed by Y
X Y	Either X or Y
X(Y)Z	Y describing the part of a string to be used as label text.

11. Contact and Technical Support

We want you to have a smooth user experience when working with the Materialise Magics Dental Module. If you do encounter any error, please always try to save your work and restart your system first.

In urgent cases you can contact our Technical Support for Maintenance Customers via e-mail.

Contact e-mails:

Worldwide: software.support@materialise.be

Korea: software.support@materialise.co.kr

USA: software.support@materialise.com

Germany: software.support@materialise.de

UK: software.support@materialise.co.uk

Japan: support@materialise.co.jp

Asia-Pacific: software.support@materialise.com.my

China: software.support@materialise.com.cn