PLANMECA

Planmeca Creo™ C5

EN

user's manual

30018643

Table of contents

The manufacturer, assembler and importer are responsible for the safety, reliability and performance of the unit only if:

- installation, calibration, modification and repairs are carried out by qualified authorised personnel
- electrical installations are carried out according to the appropriate requirements such as IEC 60364
- equipment is used according to the operating instructions.

Planmeca pursues a policy of continual product development. Although every effort is made to produce up-to-date product documentation this publication should not be regarded as an infallible guide to current specifications. We reserve the right to make changes without prior notice.

Publication number 30018643 Revision 3

Released 12 April 2019

1 Introduction

This manual describes how to use the Planmeca Creo C5 3D printer.

1.1 Indications for use

The Planmeca Creo C5 3D printer has been designed specifically to print parts for the dental industry. It is designed to be used within a dental clinic by users that have completed the appropriate training course.

The printer works by building the dental parts in successive thin layers. Each layer is created by exposing a photo-polymer (resin) to UV light. This causes the resin to polymerise (cure) into a solid where it is exposed to the light. After one layer has been cured the build platform moves up the thickness of the next layer and the process is repeated until the part is complete.

NOTE

Depending on your current configuration the parts illustrated may appear different from yours. The instructions apply, however, for all configurations.

2 Associated documentation

This device is delivered with the following manuals:

- Planmeca Creo C5 user's manual

  Describes the Planmeca Creo C5 3D printer and its different parts as well as instructs how to operate and clean the printer.

- Planmeca Creo C5 installation quick guide

  Describes how to install the Planmeca Creo C5 3D printer.

3 Training

Only fully-trained operators should operate the Planmeca Creo C5 3D printer. The printer is designed to be used within a dental clinic by users that have completed the appropriate training course.

A hands-on user's training is given in connection with the installation of this device.

4 Registering your product

Before you start using your device, you must register it to activate the warranty.

To enter the registration website, either:

- read the QR code on the package box with a QR code reader to enter the registration website

  or

- navigate to the registration website http://www.planmeca.com/register/ in your Internet browser.

Follow the instructions on the website.

5 Preventive maintenance

Keep all parts that are in contact with resin clean and free from uncured material.

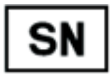
On a monthly basis, check the cleanliness of the printer's LCD panel and filter.

When necessary, clean the parts with pressurized air or replace them.

6 Symbols on product labels

A Class 2 laser is considered to be safe because the blink reflex (glare aversion response to bright lights) will limit the exposure to no more than 0.25 seconds. It only applies to visible-light lasers (400–700 nm).

Class 2 lasers are limited to 1 mW continuous wave, or more if the emission time is less than 0.25 seconds or if the light is not spatially coherent. Intentional suppression of the blink reflex could lead to eye injury. Some laser pointers and measuring instruments are class 2.



Serial number

Manufacturer (Standard ISO 7000).

Date of manufacture (Standard ISO 7000).

European conformity

Non-ionizing electromagnetic radiation

Separate collection for electrical and electronic equipment according to Directive 2002/96/EC (WEEE).

7 For your safety

Read these instructions carefully. Keep this document for future reference. Follow all warnings and instructions marked on the Planmeca Creo C5 3D printer.

CAUTION

Do not use under the following conditions:

- **In hot, cold or humid environments.**
- **In areas susceptible to excessive dust and dirt.**
- **Near any appliance that generates a strong magnetic field.**
- **Locations with an ambient temperature above 25ºC.**

7.1 Connecting and disconnecting printer

Observe the following guidelines when connecting and disconnecting power to the printer:

- Install the printer before connecting the power cord to the AC power outlet.
- Unplug the power cord before moving the printer.

7.2 Caution for accessibility

Ensure that the power outlet you plug the power cord into is easily accessible and located as close to the printer as possible. If you need to disconnect power to the printer, unplug the power cord from the electrical outlet.

CAUTION

Do not use the printer near water.

CAUTION

Do not place the printer on an unstable cart, stand or table. If the printer falls, it could cause injury and or damage.

CAUTION

Do not place the printer on any surface that is not rated to withstand the printer's weight.

CAUTION

Slots and openings are provided for ventilation to ensure reliable operation of the printer and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the printer on a soft surface or too close to a wall.

CAUTION

Do not place the printer near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.

CAUTION

Never push objects of any kind into this printer through cabinet slots as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind onto or into the printer.

CAUTION

To avoid damage of internal components, do not place the printer on a vibrating surface.

CAUTION

Using electrical power

- Operate the printer only from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Do not allow anything to rest on the power cord. Do not locate the printer where people will walk on the cord.
- If an extension cord is used with the printer, make sure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total rating of all products plugged into the wall outlet does not exceed the fuse rating.
- Do not overload a power outlet, strip or receptacle by plugging in too many devices. The overall system load must not exceed 80 % of the branch circuit rating. If power strips are used, the load should not exceed 80 % of the power strip's input rating.
- The printer's AC adapter is equipped with a three-wire grounded plug. The plug only fits in a grounded power outlet. Make sure the power outlet is properly grounded before inserting the AC adapter plug. Do not insert the plug into a non-grounded power outlet. Contact your electrician for details.

CAUTION

The grounding pin is a safety feature. Using a power outlet that is not properly grounded may result in electric shock and/or injury.

NOTE

The grounding pin also provides good protection from unexpected noise produced by other nearby electrical devices that may interfere with the performance of the printer.

Use the printer only with the supplied power supply cord set. If you need to replace the power cord set, make sure that the new power cord meets the following requirements: detachable type, UL listed / CSA certified, VDE approved or its equivalent.

7.3 Caution for servicing

CAUTION

Do not attempt to service the printer yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to qualified service personnel. Unplug this printer from the wall outlet and refer servicing to qualified service personnel when:

- the power cord or plug is damaged, cut or frayed
- liquid was spilled into the printer
- the printer is exposed to rain or water
- the printer is dropped or the case is damaged
- the printer exhibits a distinct change in performance, indicating a need for service
- the printer exhibits strange noises or odours
- the printer does not operate normally after following the operating instructions.

CAUTION

For safety reasons, do not use non-compliant parts when adding or changing components. Consult your Planmeca dealer for purchase options.

CAUTION

Your device and its enhancements may contain small parts. Keep them out of the reach of small children.

NOTE

Adjust only those controls that are covered by the operating instructions, since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the printer to normal condition.

7.4 Additional safety information

- Always wear suitable nitrile gloves and eye protection when handing printer resins and parts that have not been post-cured.
- Have a flat stable surface ready to place the basin before removal from the printer.
- Have a suitable resin proof container ready to place the platform before removal from the printer.
- Do not look into the printer's LCD when printing. The bright UV light may hurt your eyes.
- **Do not** place the printer in the following environments:
  - Non air-conditioned space
  - Space that is poorly ventilated or confined. At least 50 cm side clearance from walls and free flow of air around the printer are necessary.
  - Locations where temperatures may become excessively high.
  - Locations where excessive humidity, dust, or cigarette smoke may contaminate optical components and shorten the lifespan.
  - Locations near fire alarms.

  - Locations with an ambient temperature above 25ºC.
  - Locations where the altitudes are higher than 2000 meters.
- Unplug immediately if there is something wrong with your printer. Do not operate if smoke, strange noise or odour comes out of the printer. It might cause fire or electric shock. In this case, unplug immediately and contact your Planmeca dealer.
- Do not keep using the printer if you break or drop it. In this case contact your Planmeca dealer for inspection.
- When switching the printer off, please ensure the printer has five minutes cooling before disconnecting power.
- Do not frequently turn off the main power abruptly or unplug the printer during operation. The best way is to wait for five minutes before turning main power off.
- Ensure that the ventilation slots are clean and unobstructed. The printer’s internal temperature can rise and cause damage if ventilation slots are dirty or obstructed.
- Do not attempt to disassemble the printer. There are dangerous high voltages inside which may hurt you. The only user serviceable parts are the build platform and basin. Refer servicing only to suitable qualified professional service personnel.
- Do not stand the printer on any side except its feet. It may cause the printer to fall over, causing injury and or damage.
- Ensure the surface the printer is set up on supports the printer’s weight.

8 Resin handling

CAUTION

Do not place the printer or any resin-touching components, for example the basin or build platform, in areas of high sunlight.

CAUTION

Always wear suitable nitrile gloves and eye protection when handing printer resins and parts that have not been post-cured.

CAUTION

Use of the printer involves the use of sharp tools. Using these tools on the resin covered build platform can lead to sudden movement. Always use the removal scraper away from yourself and your hands.

NOTE

Ensure adequate ventilation when working with resins.

As sunlight has a high UV content, handling of uncured resin should be done away from strong sunlight. Artificial light also contains a UV component and as such resin should be kept in its original container with the cap on. The basin should be kept in the printer with the lid closed or in its UV protected storage box. When not being used for printing, all parts should be cleaned from uncured resin.

Before using any resin ensure that:

- The operator is familiar with the specific safety requirements for that resin.
- The working area is clean and free fromany hazards that could lead to a spill.
- The working area has a tray large enough to hold the build platform and any printed parts.
- There is an adequate supply of absorbent towels to deal with any spills should they occur.

Have a suitable resin proof container ready to place the build platform before removal from the printer.

8.1 Precautions

- Only use approved resins with the Planmeca Creo C5 Printer as listed in section "Approved resins" on page 12.
- Always wear nitrile gloves, covered arms and legs, and eye protection.
- Ensure all use of resin is undertaken in a well ventilated area.
- Ensure a spill kit is available.
- Ensure a suitable container is available to place the build platform and printed parts in.
- Ensure that a supply of isopropyl alcohol (IPA) (96%) or ethanol (96%) is available for cleaning the build platform and printed parts.

8.2 Approved resins

NOTE

Read the Planmeca “Instructions For Use” before using any of the listed resins.

Only the following resins by Dreve are approved for use with the Planmeca Creo C5 3D printer.

- FotoDent guide
- FotoDent model
- FotoDent setup (dental model material)

The list of approved resins is subject to change. Please check the latest manual for an updated list.

Only the 30cc resin cartridges supplied by Planmeca and labelled withPlanmeca's QR codes can be used

8.2.1 FotoDent model

FotoDent model material is a 3D printing material suited for printing dental models. The FotoDent model material produces accurate and detailed dental models that work perfectly as a base for dental technical work.

The following table lists the FotoDent model material properties.

Characteristics	
Colour	Beige opaque
Density	approx. 1.1 - 1.2 g/cm^3
Viscosity (23°C)	0.8 - 1.3 Pa s
Flexural strength	60 - 70 MPa
Flexural modulus	2.3 - 2.5 GPa

Composition	
1	(Meth)acrylates
2	Initiators
3	Pigments

Cured material	
Flexural modulus	≥ 1750 MPa
Flexural strength	≥ 85 MPa
Elongation at break	11 - 15 %

8.2.2 FotoDent guide

FotoDent guide material is 3D printing material suited for printing surgical guides. FotoDent guide material has CE medical approval.

The following table lists the Planmeca Surgical Guide material properties.

Characteristics	
Colour	Blue transparent
Density	1.1 - 1.2 g/cm^3
Viscosity (23°C)	0.65 - 1.05 Pa s

Composition	
1	Methacrylates
2	Initiators
3	Inhibitors
4	Dyes

Cured material	
Post curing time using PCU EVO	10 min in a protective gas atmosphere
Flexural modulus	≥ 1700 MPa
Flexural strength	≥ 75 MPa
Elongation at break	10 - 15 %
Hardness	80 - 85 Shore D

8.2.3 FotoDent setup

FotoDent setup material is a 3D printing material suited for creating orthodontic set-up models. FotoDent setup material has medical CE approval.

The following table lists the material properties.

Characteristics	
Colour	Maize yellow
Density	approx. 0.9 - 1.0 g/cm^3
Viscosity (23°C)	1.0 - 1.5 Pa s

Composition	
1	Methacrylates
2	Urethane acrylates
3	Initiators
4	Pigments
5	Fumed silica

Cured material	
Post curing time using PCU EVO	8 minutes with 80% LED-intensity
Flexural modulus	≥ 2000 MPa
Flexural strength	≥ 95 MPa
Elongation at break	≥ 5 %
Hardness	approx. 80 - 85 Shore D

8.2.4 Resin handling notes

Each resin type has specific instructions for use. Refer to these instructions for more information.

Shake the resin cartridge well to ensure an even mix of pigment.

Immediately clean up any spills using IPA (96%) or ethanol (96%). If left, the resin cures, making cleaning more difficult.

Only remove the basin from the Planmeca Creo 3D printer after the platform has been removed. Drips from the platform can damage the projector and the LCD screen causing permanent damage.

If necessary, after removing the printed part from the platform, clean the platform of uncured resin using IPA (96%) or ethanol (96%). Use only solvents that leave no residue. If available, use an ultrasonic tank or steam-cleaner.

NOTE

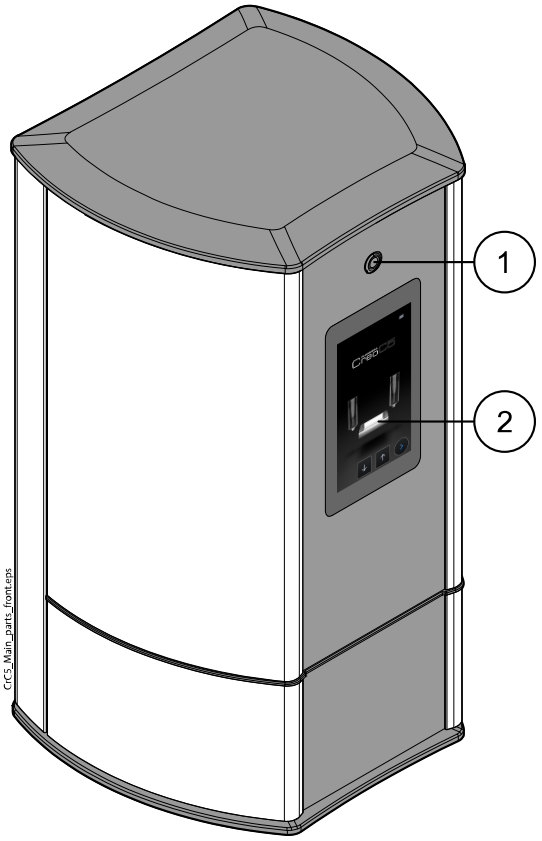
Planmeca recommends that you clean the basin and build platform on a daily basis to optimise printing success.

If you use an IPA (96%) or ethanol (96%) bath to wash the build platform, uncured resin in suspension in the IPA (96%) or ethanol (96%) can semi-cure into a gelatinous substance. Dispose of this waste responsibly.

Dry the build platform thoroughly to ensure that no IPA (96%) or ethanol (96%) remains on the surfaces, as this can interfere with the print.

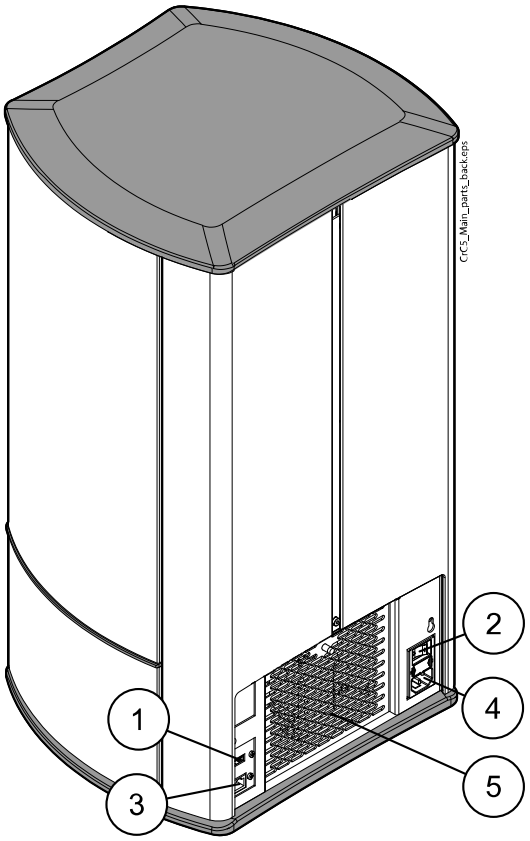
Do not sand the build platform or treat its surfaces in any way that will affect the adherence of the print.

9 Main parts

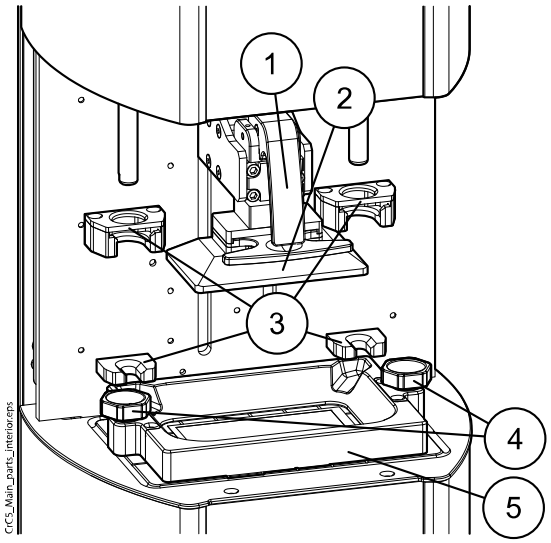


1 Stand by switch

2 Touch screen control panel

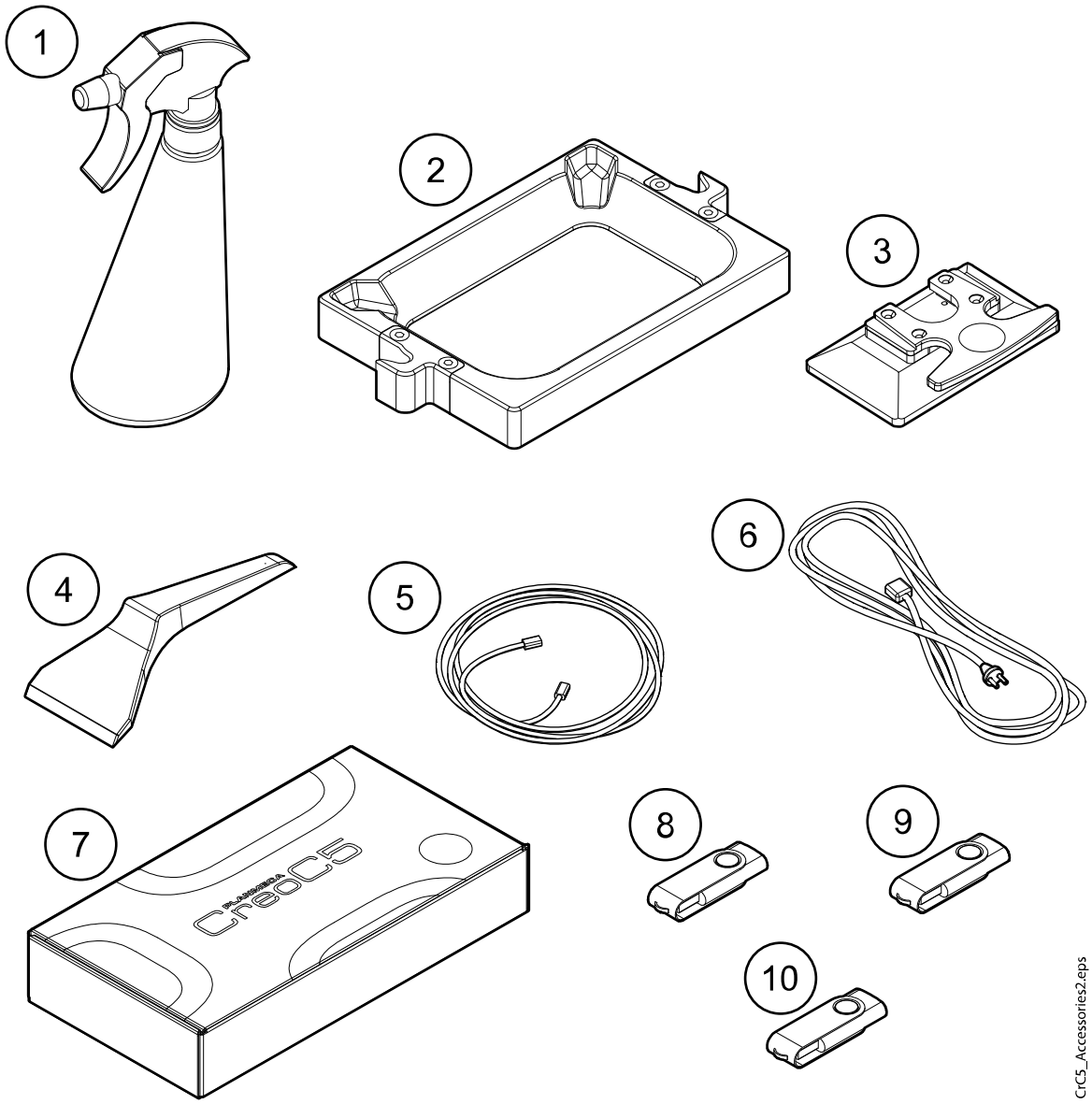


1 USB Interface	2 On/Off switch	3 Ethernet Interface	4 Power socket	5 Filter



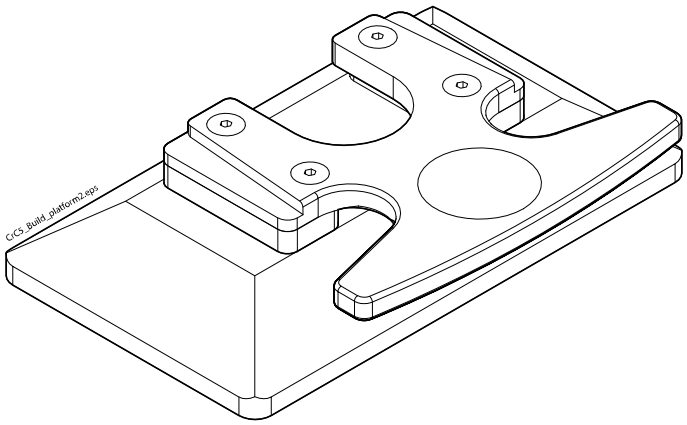
1 Build platform release lever	2 Build platform	3 Resin cartridge holders	4 Basin attachment knobs	5 Basin frame

9.1 Printer accessories



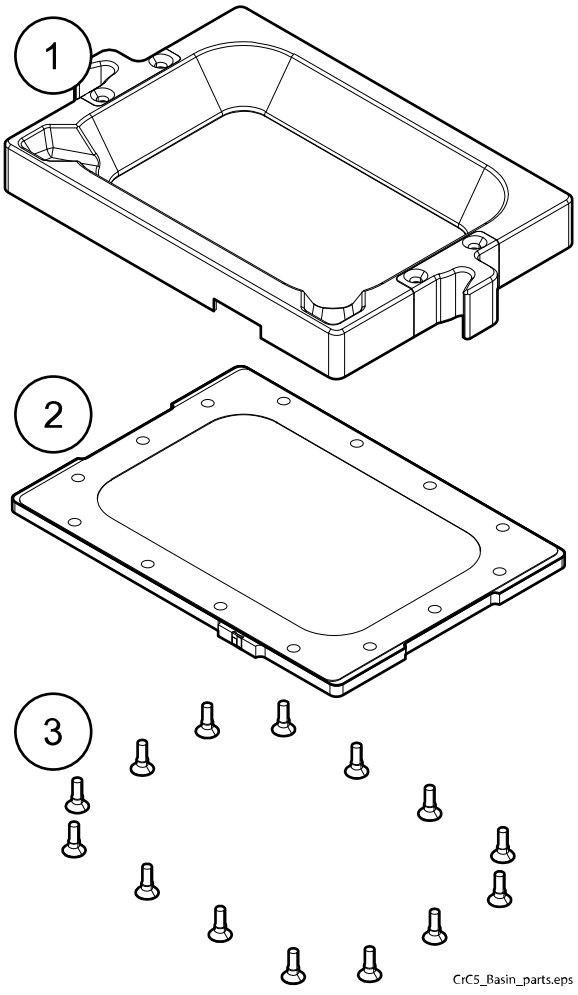
1 Spray bottle
2 Basin
3 Build platform
4 Scraper
5 Ethernet cable
6 Power cord
7 Resin cartridges (10 pcs)
8 Creo C5 manuals USB flash drive
9 Creo C5 software USB flash drive
10 Creo C5 software licence USB flash drive

9.1.1 Build platform



9.1.2 Basin

The basin consists of the following components:



1 Frame

2 Teflon film with outer frame

3 Attachment screws (14 pcs)

The slots on the corners of the basin on are intended for pouring out the excess resin.

CAUTION

Handle the Teflon film with care for not to scratch or otherwise harm it. On how to replace the film see section "Replacing Teflon film" on page 23 .

9.1.3 Resin cartriges

The Planmeca Creo C5 3D printer is delivered with a box of 10 individual resin cartridges for 3D printing.

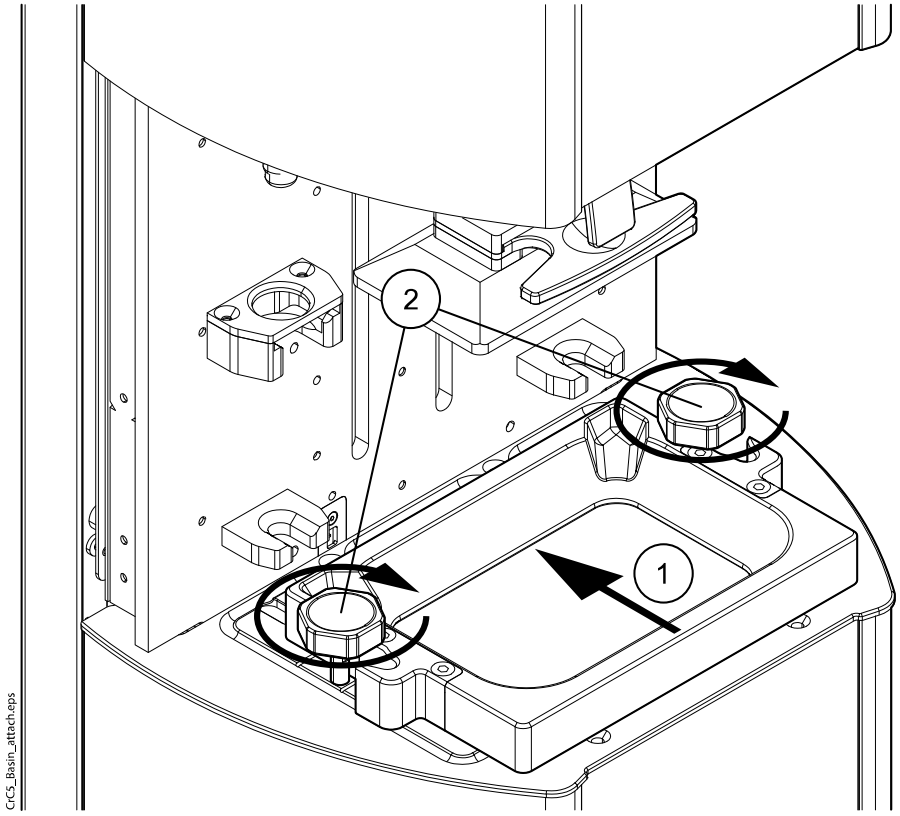
10 Preparations before printing

10.1 Attaching basin

1. Place the basin to the back of the printer.
2. Gently tigthen the screws on both sides of the basin to secure it in place.

NOTE

Ensure that the basin is securely fastened in place. A poorly secured basin may cause failed prints.



10.2 Calibrating build platform

The Planmeca Creo C5 3D printer does not need any complicate calibration procedures.

When taking first time into use and after some maintenance tasks (e.g. replacing parts) it is appreciable to carry out the build platform calibration.

1. Switch on the printer.
2. Drive the printer lid up.

In the printer control panel, touch the **UP** button.

3. Set the printer accessories as follows.

   Attach:

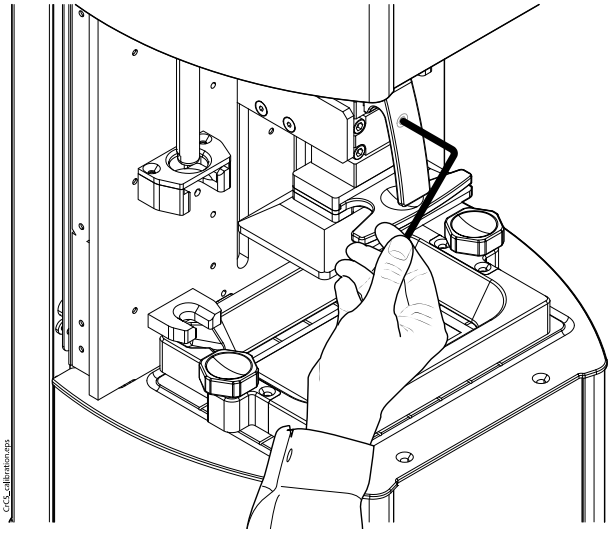
   - build platform
   - basin

   Remove:

- resin cartridges

4. From the printer's control panel main screen, touch the **Settings** button.
5. In the **Settings** menu, touch the **Calibrate build platform** option.

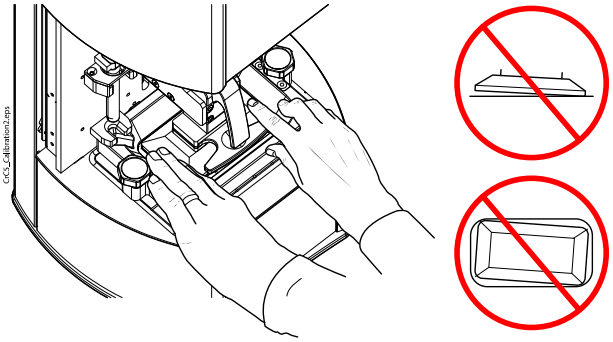
   Instructions for the calibration procedure is shown also available on the printer's screen.
6. Loosen slightly the most right build platform attachment screw with 5 mm Allen key.



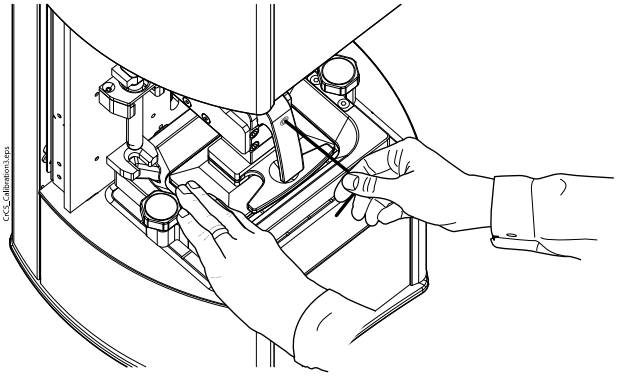
7. Touch the **Down** button to drive the build platform down to touch the basin.

   Note, you must touch continuously the **Down** button to move the build platform down.
8. Ensure that the build platform rests evenly towards the basin.

   If needed, press by hands the build platform against the basin.



9. Tighten the build platform attachment screw with 5 mm Allen key.



10. Touch the **Ready** button to complete and close the calibration mode.

10.3 Attaching resin cartridges

CAUTION

The basin bottom film is very easy to damage using scraper, tools or fingernails.

NOTE

Planmeca Creo C5 has an automatic material fill function with a cartridge system. Do not pour materials directly in to the basin, only add cartridges to the machine when asked.

NOTE

Always add cartridges to the machine with the 3D printing material chosen for the print job. The material is chosen in the print job configuration in Planmeca Creo C5 Studio software.

NOTE

To protect your hands and eyes (the resin can cause reactions over time), and to avoid getting oil from skin onto sensitive surfaces, wear gloves at all times.

NOTE

In Planmeca Creo C5 Studio, when you generate a print job disregard the “resin required” amount. This refers only to the total resin cured into the print itself, not to the amount required inside the basin for a successful print. The Creo C5 will inform the user if and when it needs more material.

NOTE

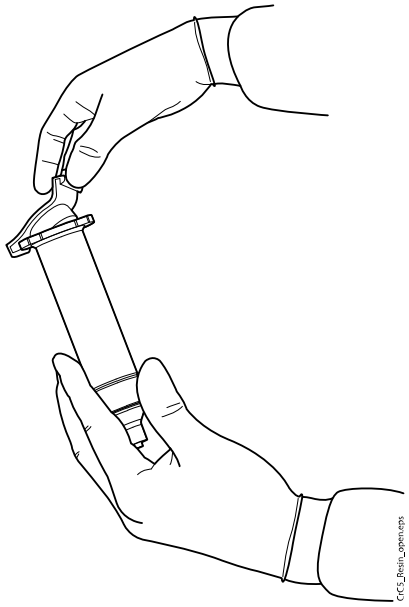
Use one build platform and basin per material.

NOTE

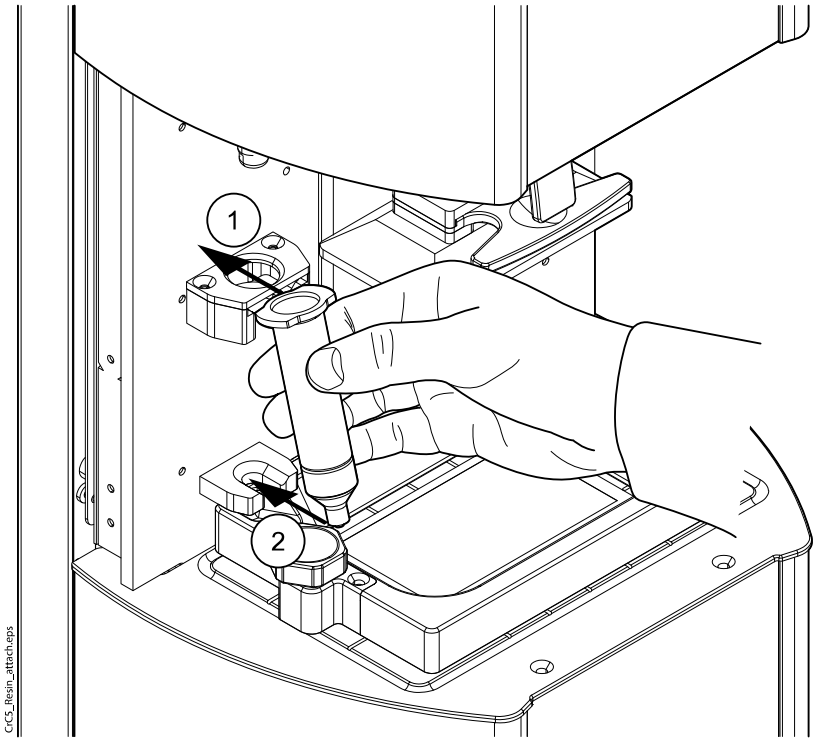
Any spills should be cleaned immediately with isopropyl alcohol (IPA) (96%) or ethanol (96%), if left they will cure making cleaning more difficult.

1. Install the basin and the build platform into the printer before adding material cartridges to the cartridge holder.
2. Shake the resin cartrige for 5 minutes before use. This mixes the pigment properly and ensures even spread of colour.

3. Remove the top and bottom caps of the resin cartridge.



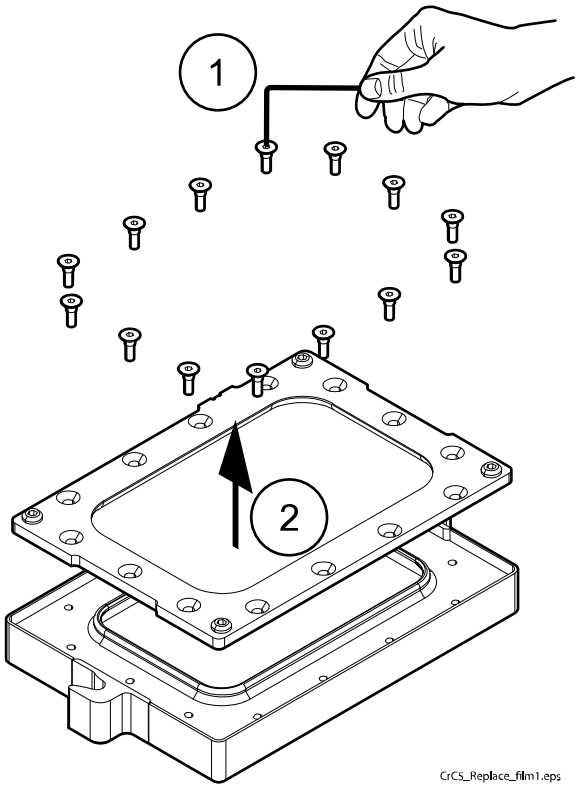
4. Attach the resin cartridge to the 3D printer's cartridge holder by pushing first the upper part of the cartridge in place and then the lower part.



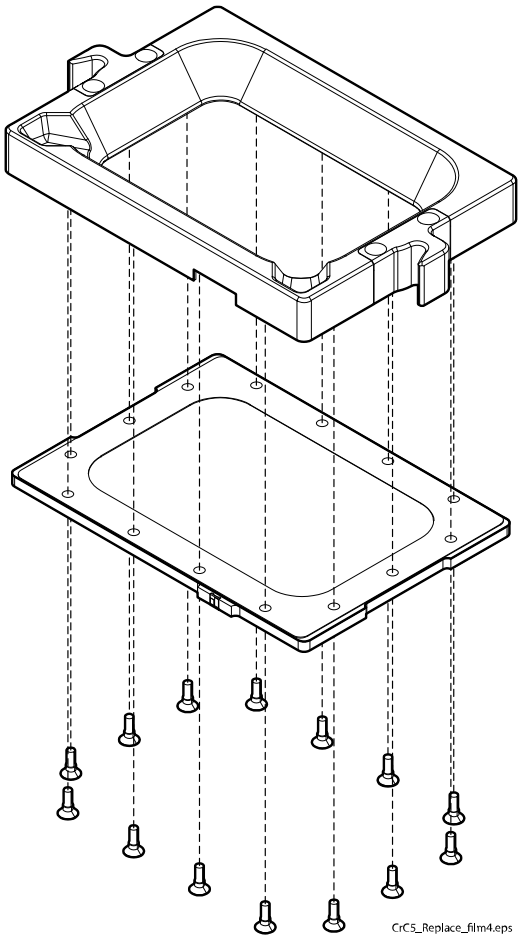
10.4 Replacing Teflon film

The Teflon film needs to be replaced if leakeage is detected or visible scratches develop on the surface.

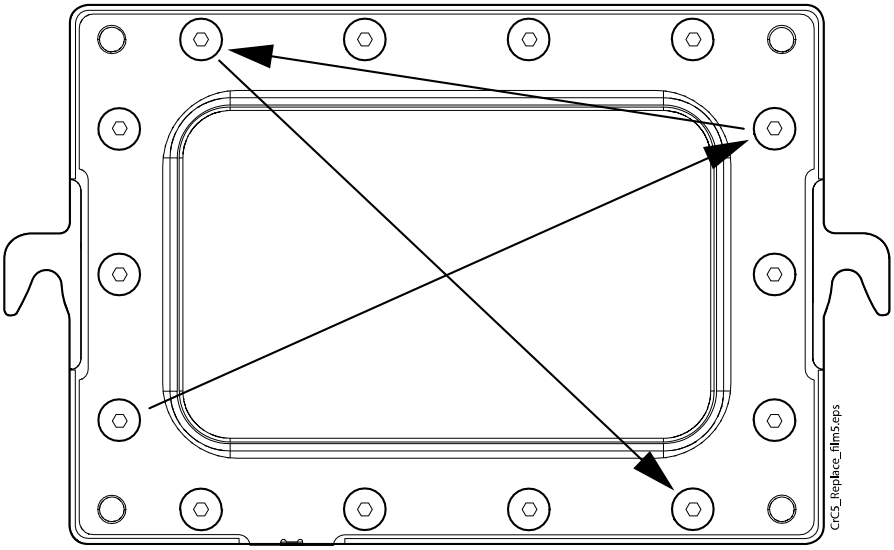
1. Detach the attachment screws and lift off the current frame.



2. Place the new film frame onto the basin and place the screws on the screw holes.



3. Start tightening the opposite and crosswise screws of the frame bit by bit.



11 Printing

CAUTION

Before starting to print, make sure you have enough material in the basin.

CAUTION

Do not block the slots and openings on the printer provided for ventilation.

NOTE

The printer can pause and resume, but if there is a power failure or the printer switches off for any other reason, printing suspends and cannot resume. Clean out resin and printed material and start again.

11.1 Starting Planmeca Creo C5 studio software

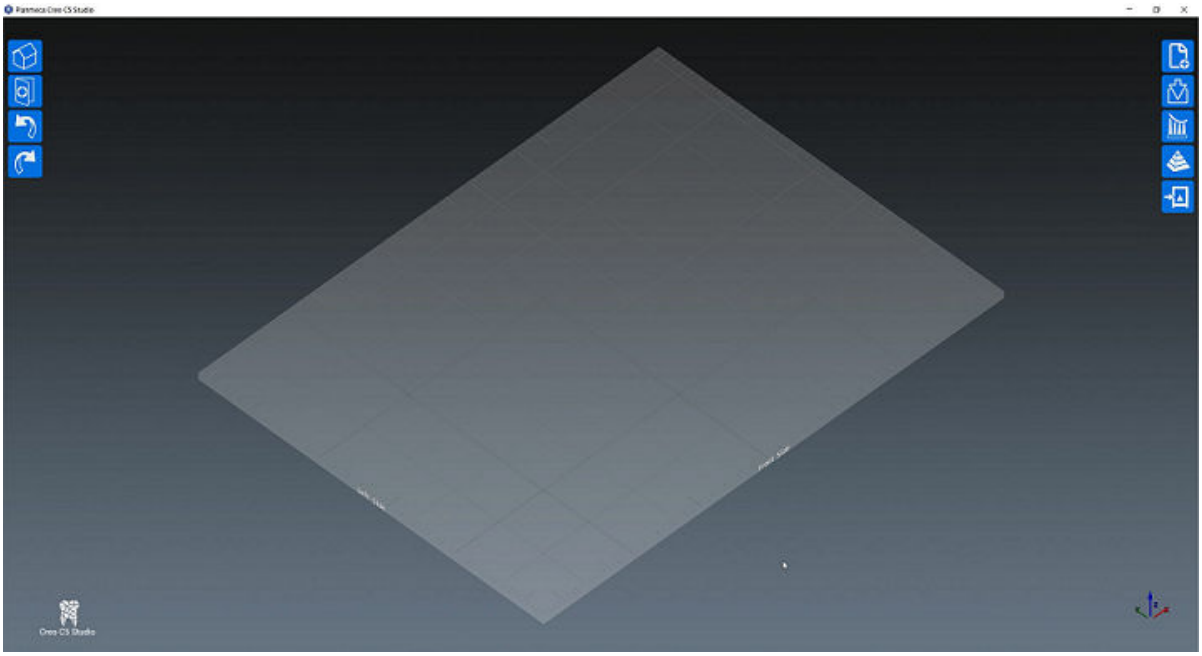
Planmeca Creo C5 Studio supports the Windows operating systems 7, 8 and 10.

Planmeca Creo C5 Studio is a software created specifically to be used with the Planmeca Creo C5 3D printer.

1. Open Planmeca Creo C5 Studio software by double-clicking the **Planmeca Creo C5** icon on your desktop.

The Planmeca Creo C5 Studio starts.

The main window opens.

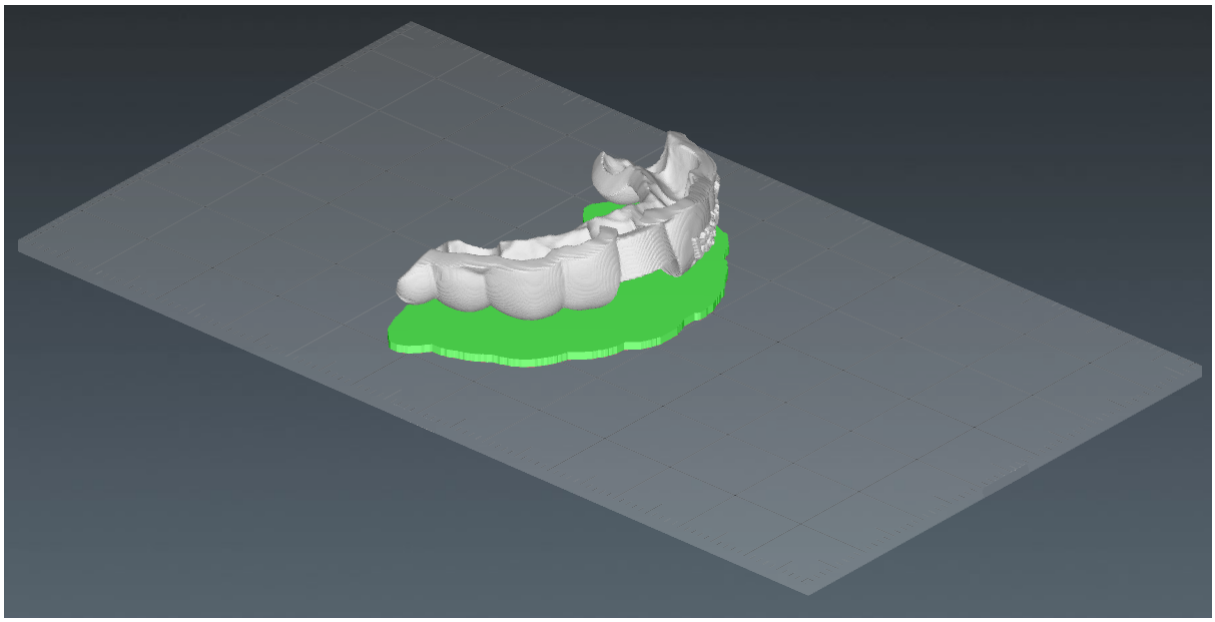


You can continue to printing, see section "Printing new projects" on page 27.

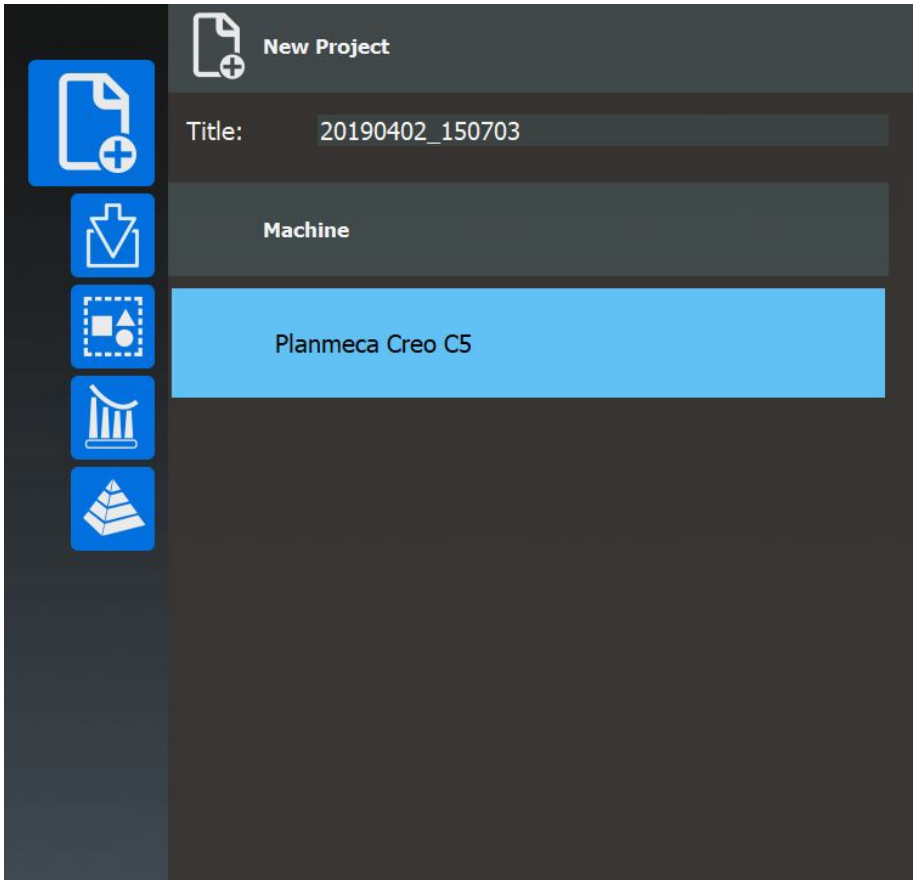
11.2 Printing new projects

1. Start a new project by tapping this icon on the main screen on the upper right corner.

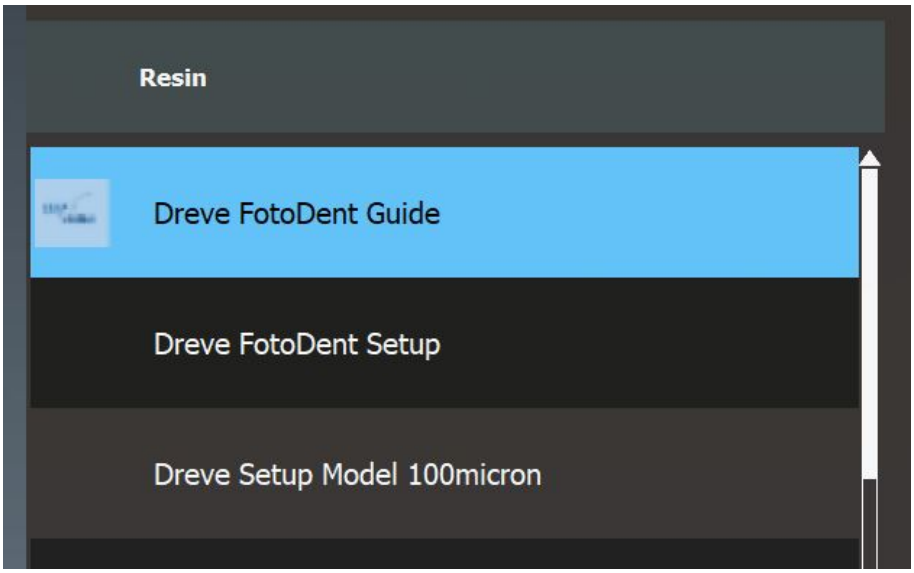
By clicking the view buttons you can change the direction from which you are viewing the platform.



2. Select the printer you want to use for the job.



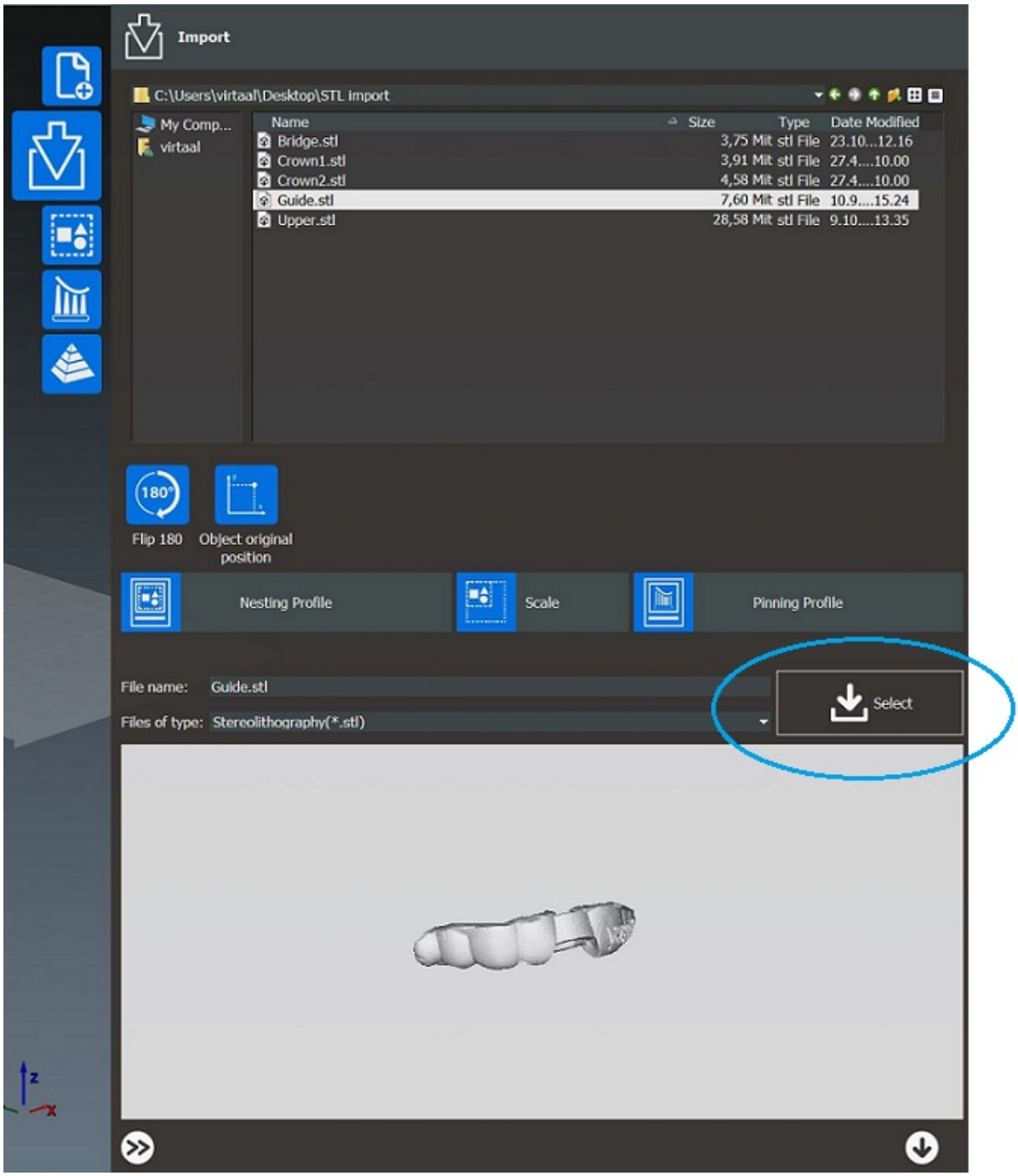
3. Select the suitable resin.



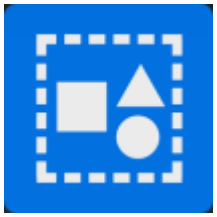
4. Click the **Import** button.

If you are printing multiple files, import each file separately.

5. On the list click on the *.stl* file you want to import and then click **Select**.



6. To arrange the models on the platform click the **Nesting** button.

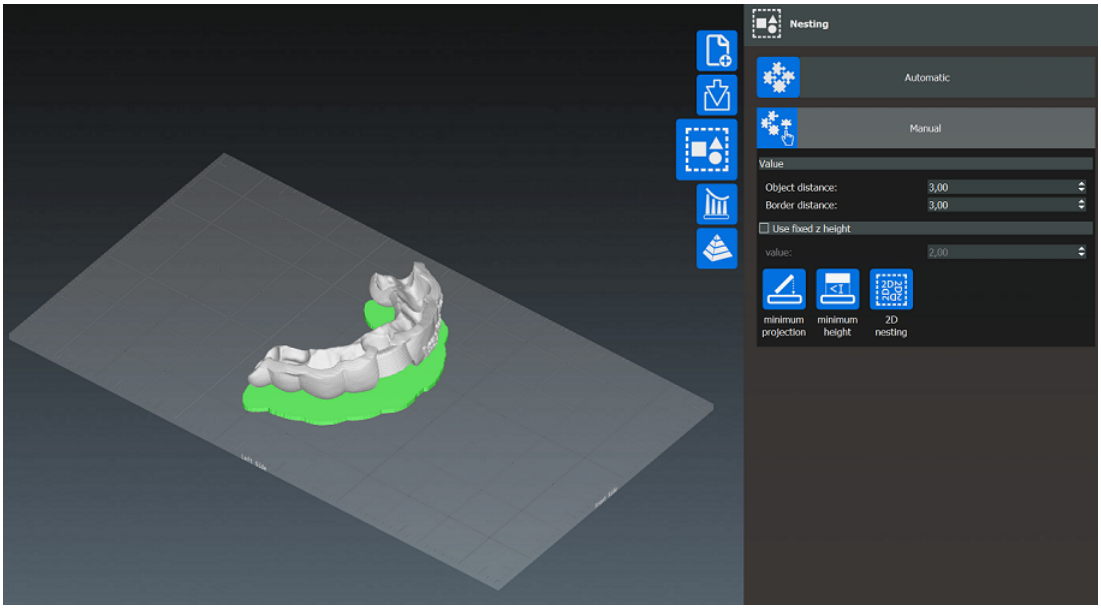


For automatic nesting touch the **Automatic** button.

To arrange the models manually touch the **Manual** button simply drag and drop the models on the platform as desired.

To adjust the distance between objects and borders use the drop-down menus or enter the desired value into the respective field.

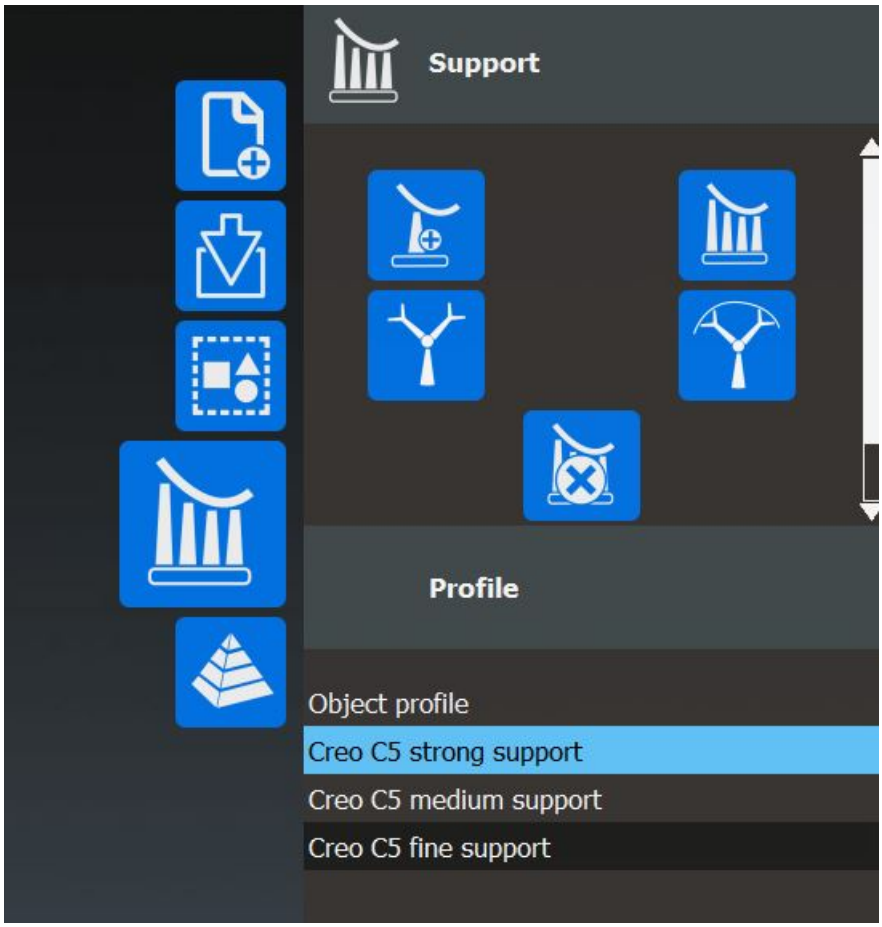
You can also set the value for minimum projection and height and for 2D nesting



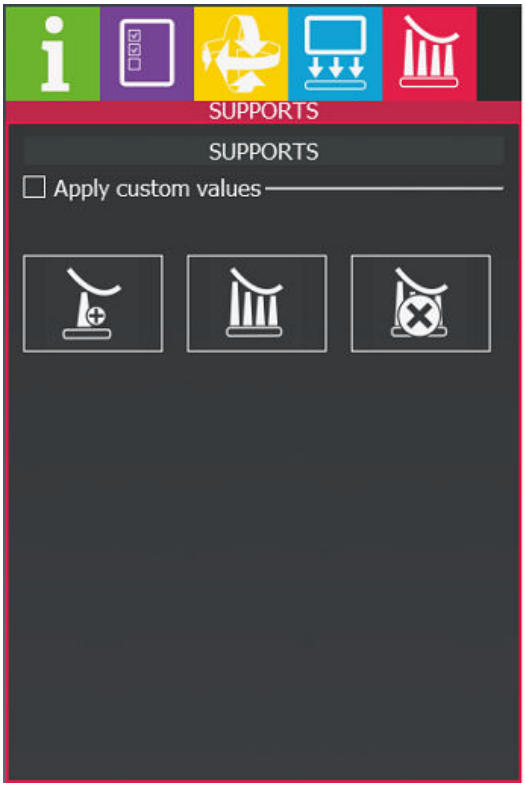
7. Click this button to add support pins.

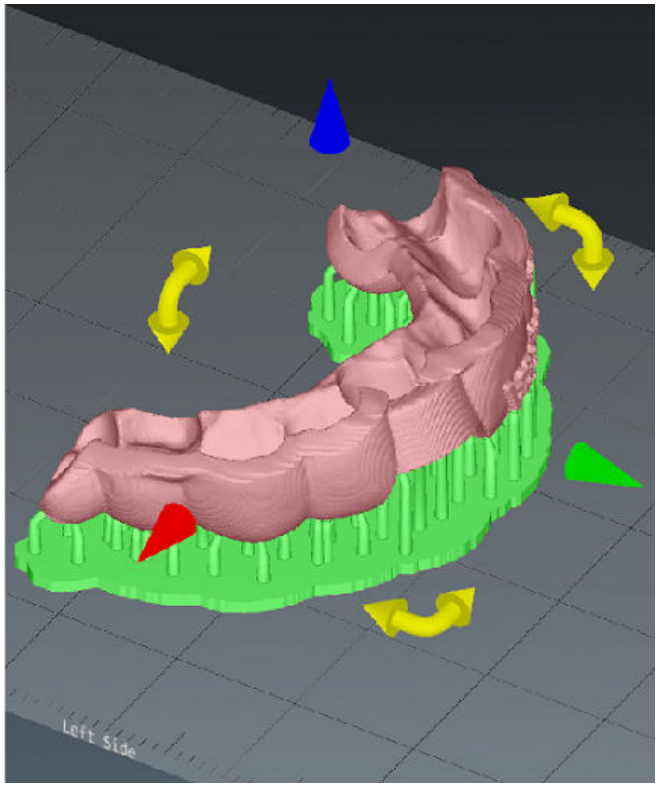
You can select the type of support by clicking the buttons of different support pin types and selecting the support pin profile from the *Profile* menu.

Support pins can be added manually or automatically and if needed manually adjusted and removed one by one.



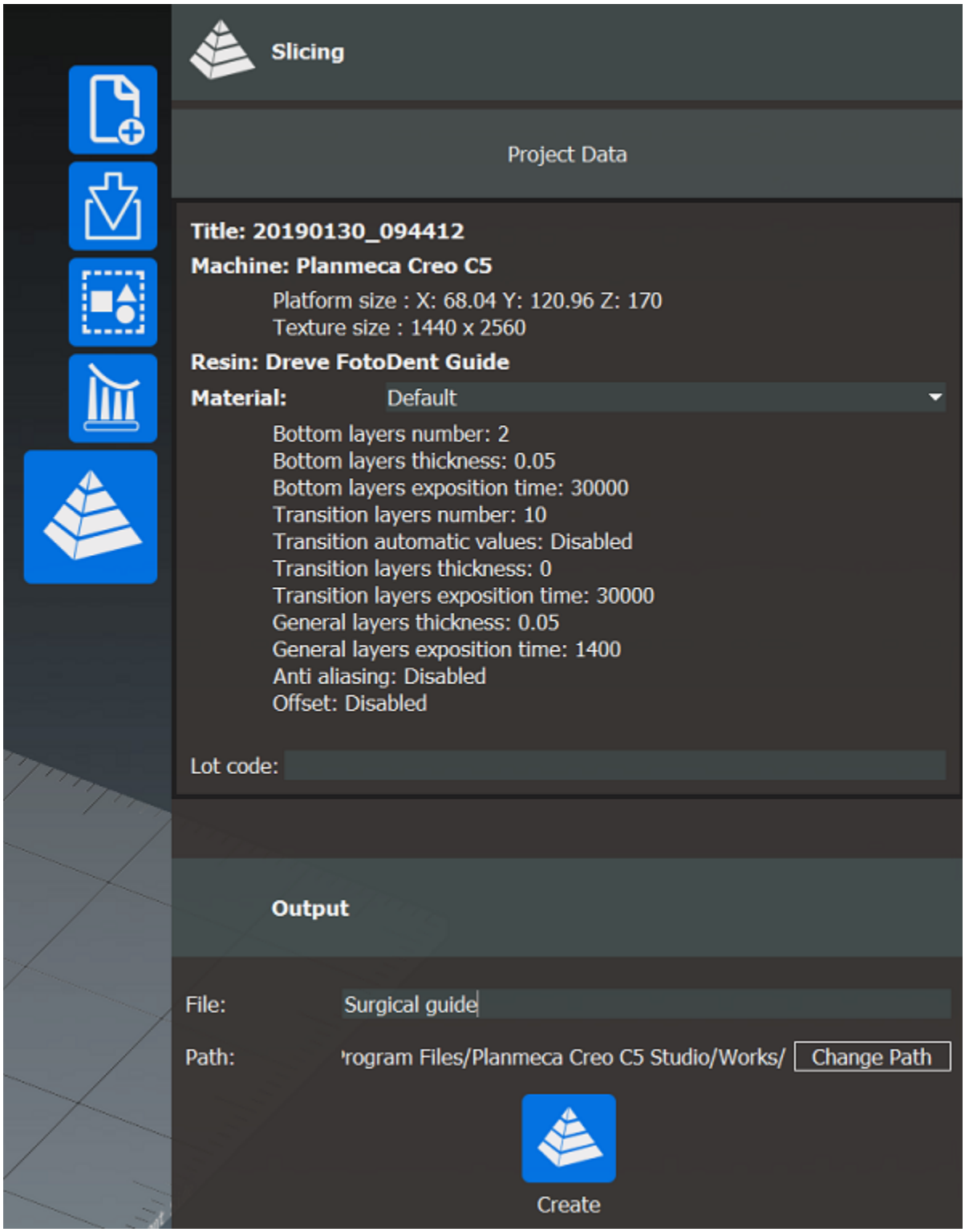
8. You can adjust the support pins by dragging from the arrows around the model.



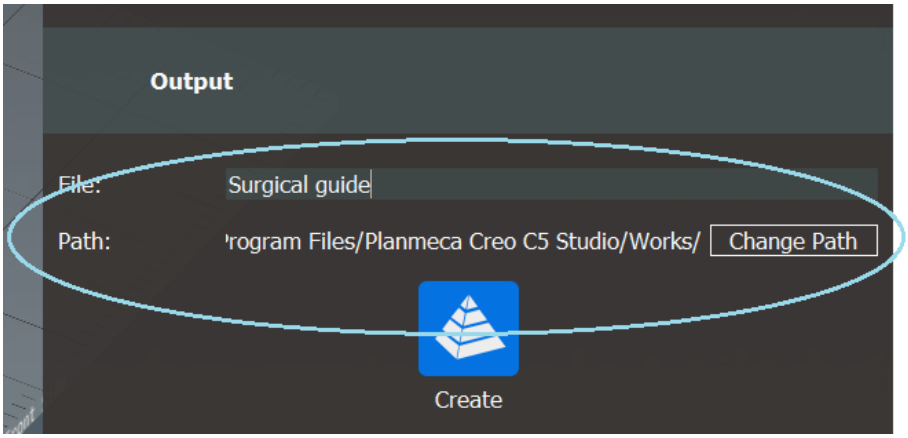


You can undo or redo any adjustments by clicking the **Undo** and **Redo** buttons on the left side of the screen.

9. To view detailed project data, click the **Slicing** button.


Slicing
Project Data
Title: 20190130_094412
Machine: Planmeca Creo C5
Platform size : X: 68.04 Y: 120.96 Z: 170
Texture size : 1440 x 2560
Resin: Dreve FotoDent Guide
Material: Default
Bottom layers number: 2
Bottom layers thickness: 0.05
Bottom layers exposition time: 30000
Transition layers number: 10
Transition automatic values: Disabled
Transition layers thickness: 0
Transition layers exposition time: 30000
General layers thickness: 0.05
General layers exposition time: 1400
Anti aliasing: Disabled
Offset: Disabled
Lot code:
Output
File: Surgical guide
Path: rogram Files/Planmeca Creo C5 Studio/Works/
Change Path
Create

If necessary you can change the folder where the .stl 3D print file is saved by clicking the **Change path** button and selecting the folder where you want the print file to be saved.

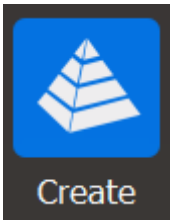


The print file is saved as a zip file either onto a USB flash drive (if configured) or to a computer folder with the name entered in the *File* (*Surgical guide* in this example) and shows with this name also on the print job list.

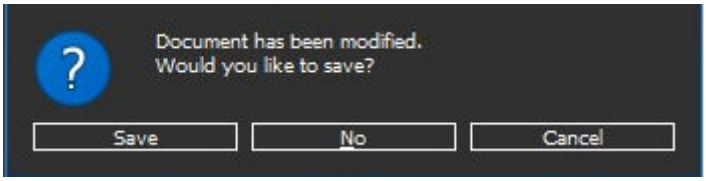
NOTE

For the software to find the files on the USB flash drive, the files must be saved directly into the USB folder, *not* in its possible sub-folders.

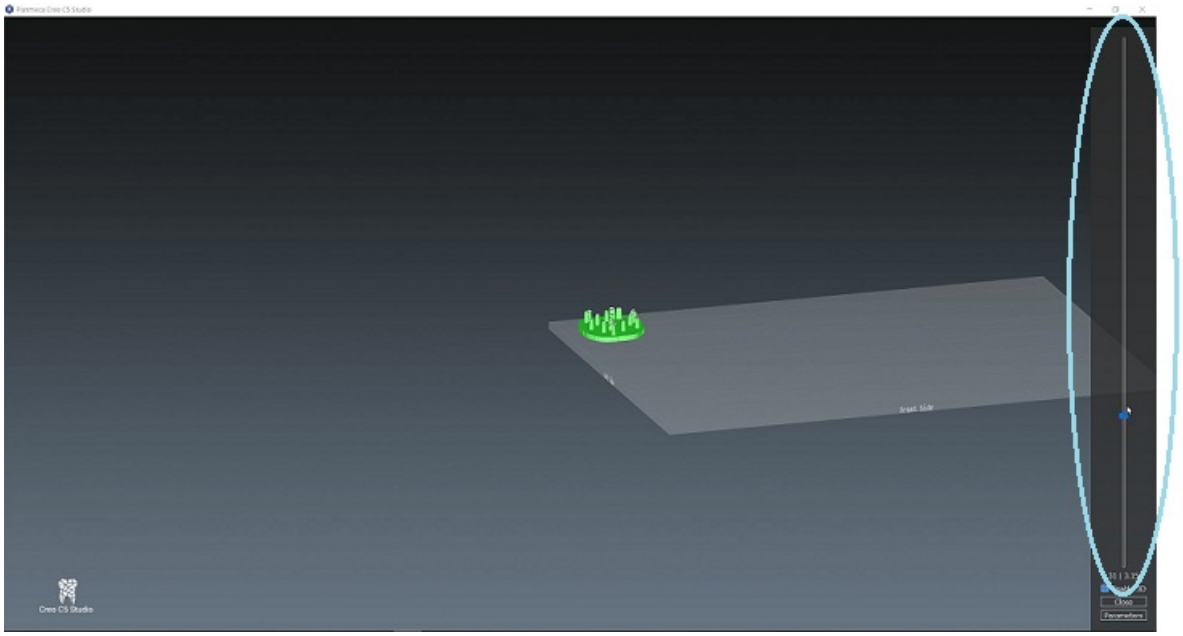
10. Click the **Create** button.



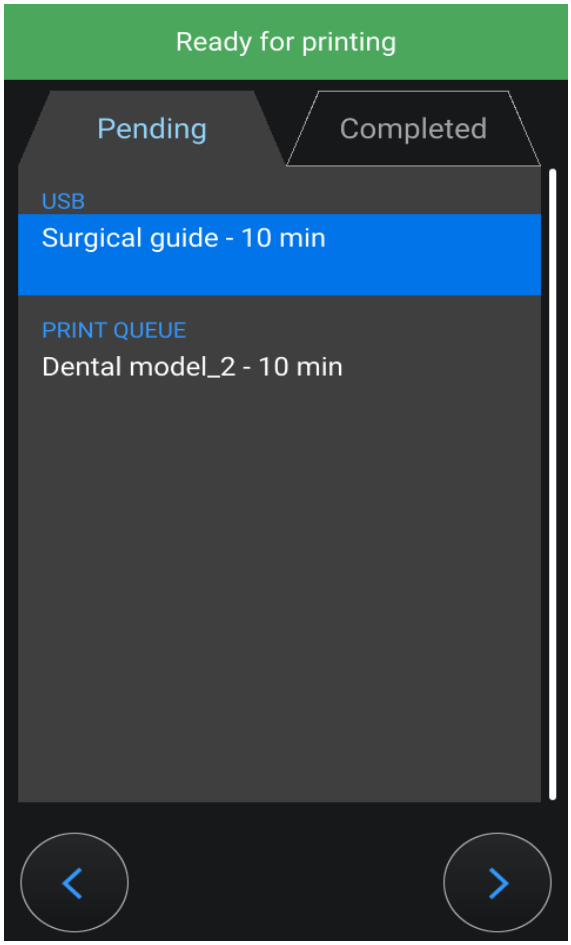
11. Confirm the changes by clicking **Save**.



12. Use the slider to view the print layers.

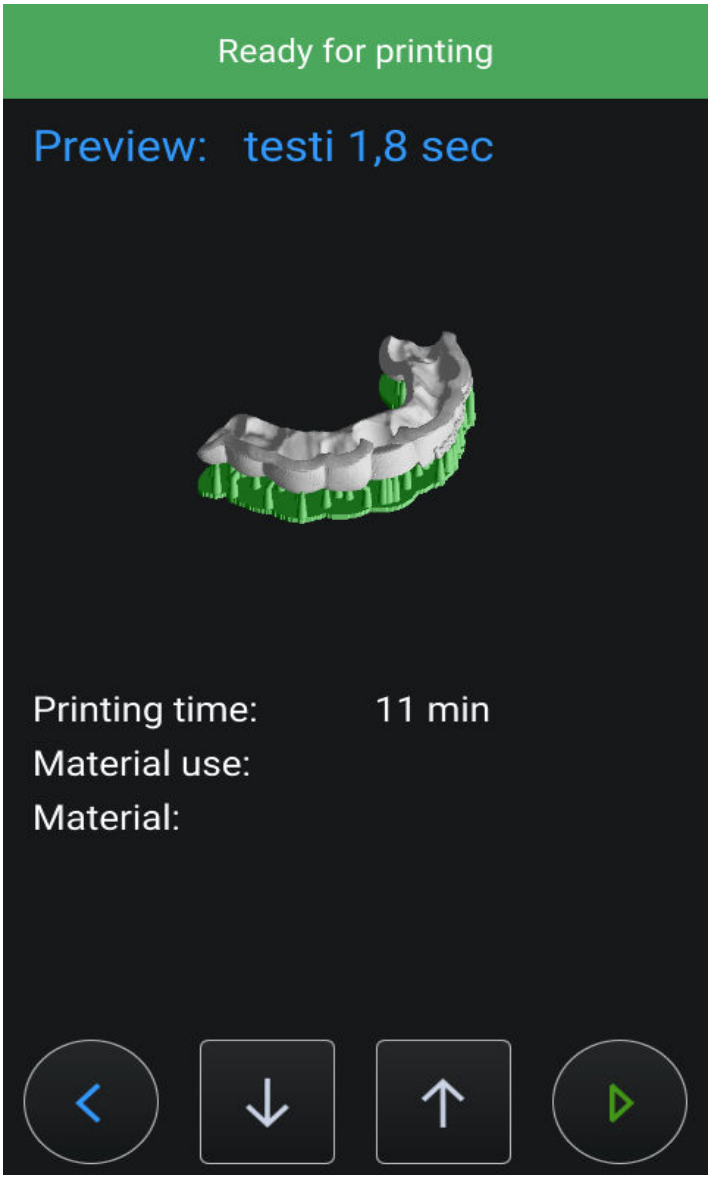


13. Go to the printer.
14. Select the job from the list on the *Pending* tab and click the **Next** button at the lower right corner of the screen.

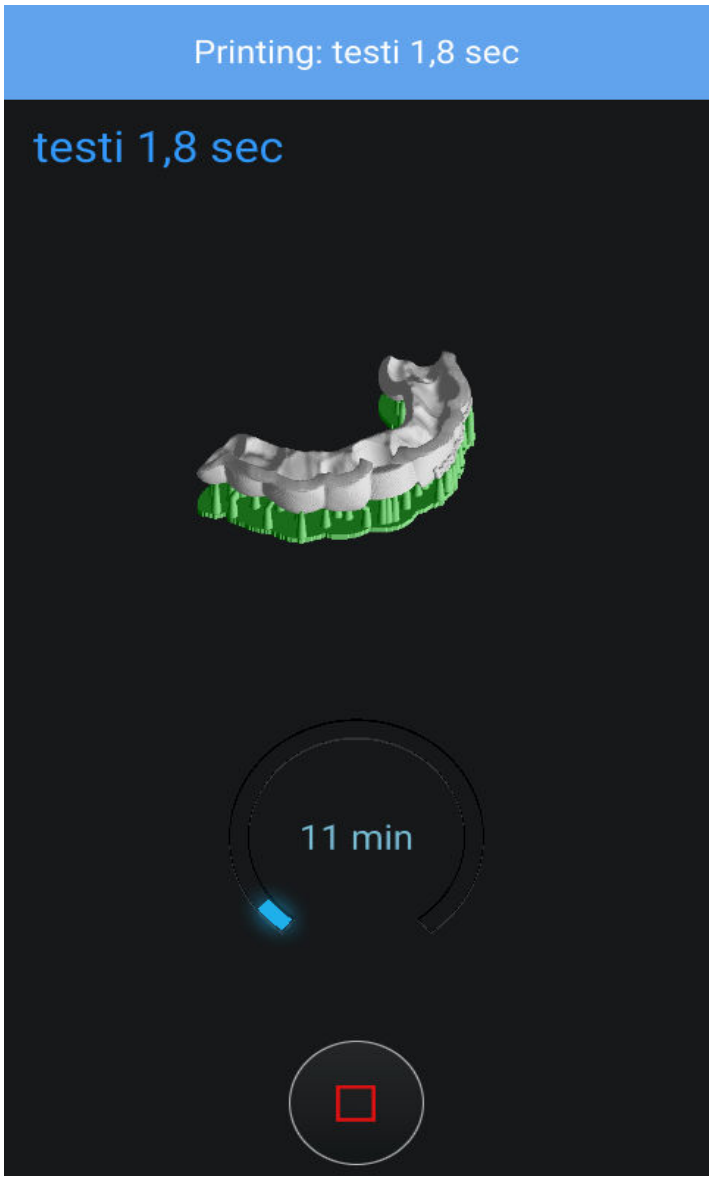


15. A preview of the completed printout with estimated printing time, the amount of material required and the used material are displayed.

    Start printing by clicking the green arrow button at the lower right corner of the screen.



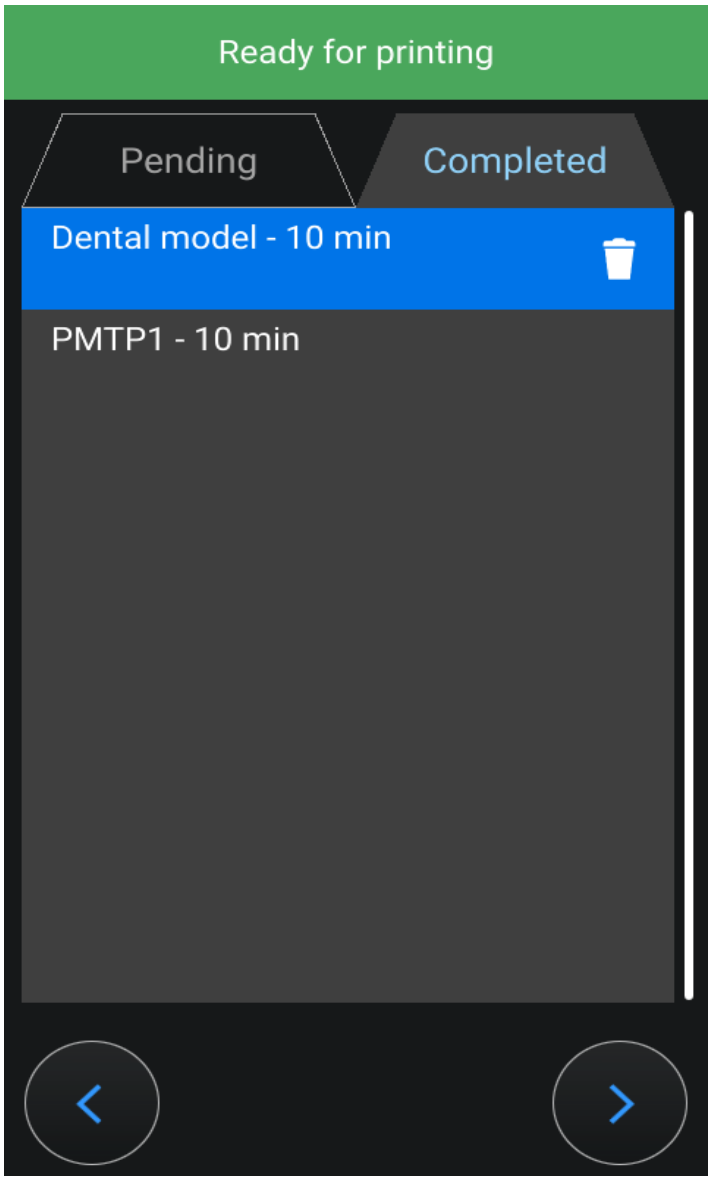
The estimated time left for printing is displayed.



16. Wait until the printing is successfully completed and clean and dry the build platform.
17. Continue to section "After printing" on page 40.

11.3 Printing previously printed projects

All previously printed projects (also the unfinished ones) are saved under *Completed* tab and can be printed again by selecting them on the list. For detailed printing workflow refer to the instructions in section "Printing new projects" on page 27.



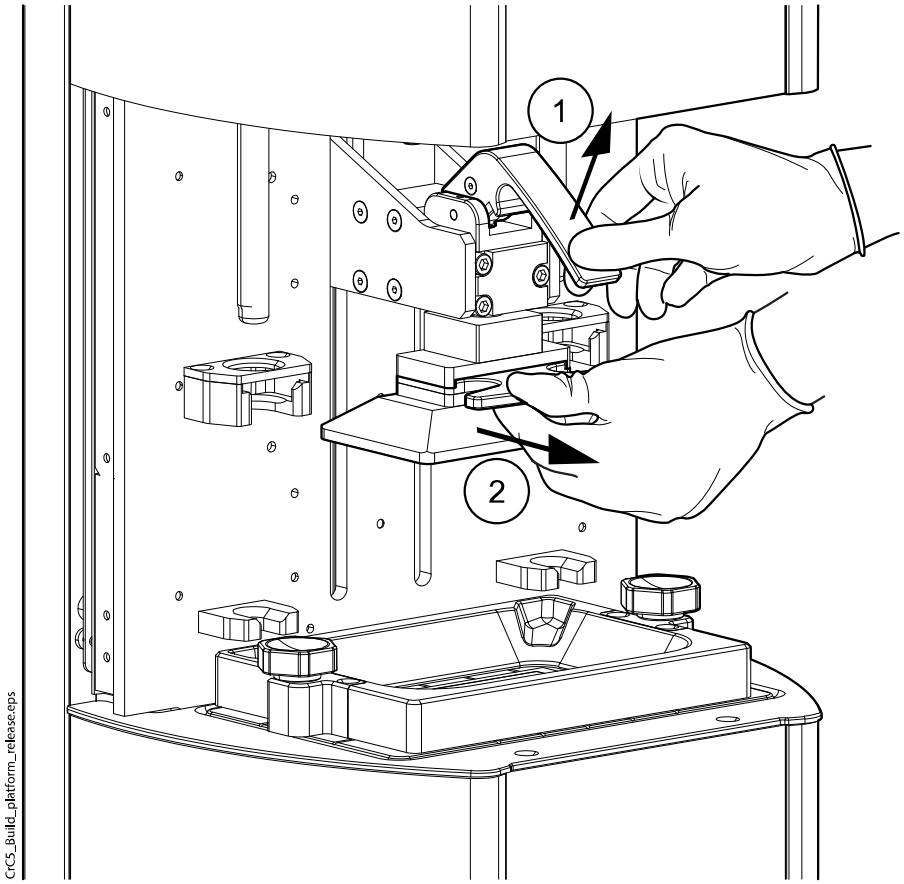
12 After printing

12.1 Removing build platform from printer

NOTE

To avoid getting resin inside the printer, always remove the build platform before removing the basin.

Remove the platform by lifting the handle (1) and pulling out the platform (2).



12.2 Removing prints from build platform and post-processing

The prints should be removed using the scraper provided.

CAUTION

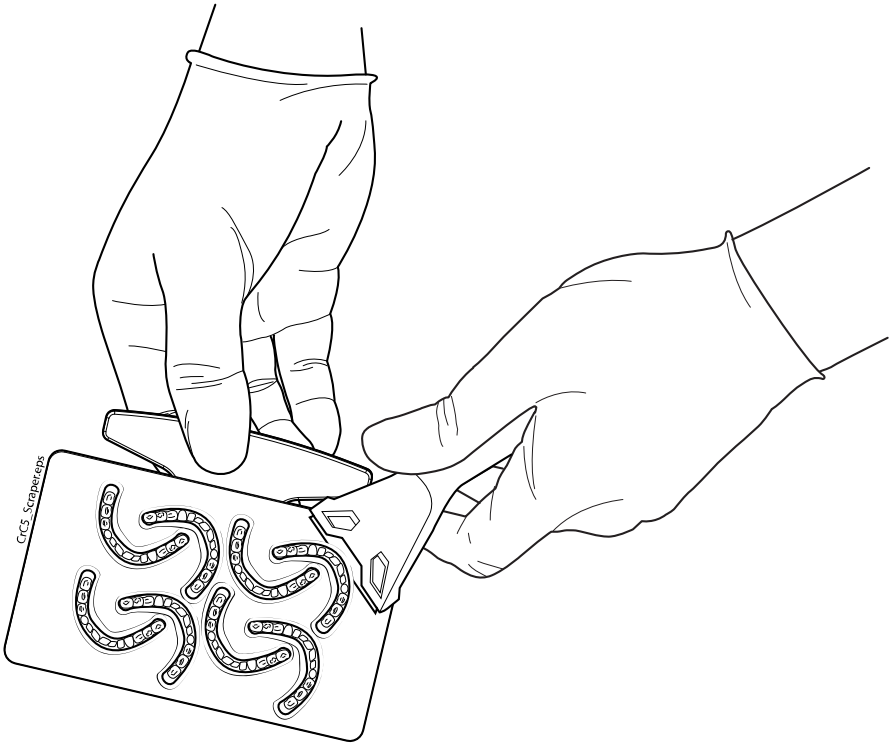
Be careful with not to damage yourself or the platform surface with the scraper when removing the print from the platform.

NOTE

Trying to remove the print working only from one corner can cause the print to break.

1. Place the platform long edge down on a flat surface covered with an absorbent cloth to catch any resin.

2. Using the scraper work it gently under one corner of the print. Repeat working the scraper under all the corners. Rotate the platform if required.



3. Be gentle when using the scraper around the edges, and gradually separate the print from the platform.

   To make part removal easier and reduce the chance of platform damage, use the scraper at the shallowest angle possible.

4. Once the print is free of the build platform it needs to be post-processed. The prints need to be cleaned from uncured resin and cured in an UV curing unit before use.

For more post-processing instructions, see the resin's own instructions.

12.3 Cleaning build platform

After the printed part has been removed from the build platform it should be cleaned from uncured resin with isopropyl alcohol (IPA) or ethanol. Use only solvents that leave no residue. If available, use of an ultrasonic tank will help. When handling the build platform, always wear gloves. Any contamination of the printing surface can lead to failed prints.

NOTE

Dry the build platform thoroughly to ensure that no IPA / ethanol (96 %) remains on the surfaces, as this can interfere with the print.

NOTE

The build platform should be cleaned at least once a day at the end of the workday

1. Using IPA / ethanol (96 %) clean the build platform every time you finish printing.
2. Clean the platform with a steam cleaner. Otherwise rinse thoroughly in IPA / ethanol (96 %) bath.

12.4 Removing, emptying and cleaning basin

CAUTION

The basin should only be removed from the printer after the build platform has been removed, otherwise drips from the build platform can damage the LCD causing permanent damage.

CAUTION

The basin-bottom film is very easy to damage using scraper, tools or fingernails.

CAUTION

Do not remove cured resin from basin using scraper. Peel off any cured material gently by hand.

CAUTION

Always use a microfibre cloth to wipe and dry the Teflon film. Do not use paper towels.

Have a flat stable surface ready to place the basin before removal from the printer.

1. Loosen the basin retaining screws.
2. Lift out the basin.

   CAUTION

   Do not leave resin in the printer after printing.

   NOTE

   Uncured resin can be reused if left in the basin. For instructions on how to store the surplus resin, see section "Resin handling notes" on page 13.
3. After emptying, using IPA or ethanol clean the basin every time you finish printing.
4. Wipe the basin clean with a microfibre cloth, dry with compressed air to ensure no paper fibres remain. Otherwise rinse thoroughly in IPA / ethanol (96%) bath.

   NOTE

   Dry the basin thoroughly to ensure that no IPA / ethanol (96%) remains on the surfaces, as this can interfere with the print.
5. Use only solvents that leave no residue. When handling the basin ensure no sharp objects touch the print film surface as this has a delicate surface coating.

   CAUTION

   If the surface becomes damaged, printing liquids might get onto the LCD screen damaging it.

12.5 Cleaning outside surfaces of printer

CAUTION

Do not use liquid cleaners or aerosol cleaners.

CAUTION

Do not use abrasive cleaners, waxes or solvents to clean the printer.

CAUTION

Clean any spills immediately with isopropyl alcohol (IPA) (96%) or ethanol (96%). If left, they will cure, making cleaning more difficult.

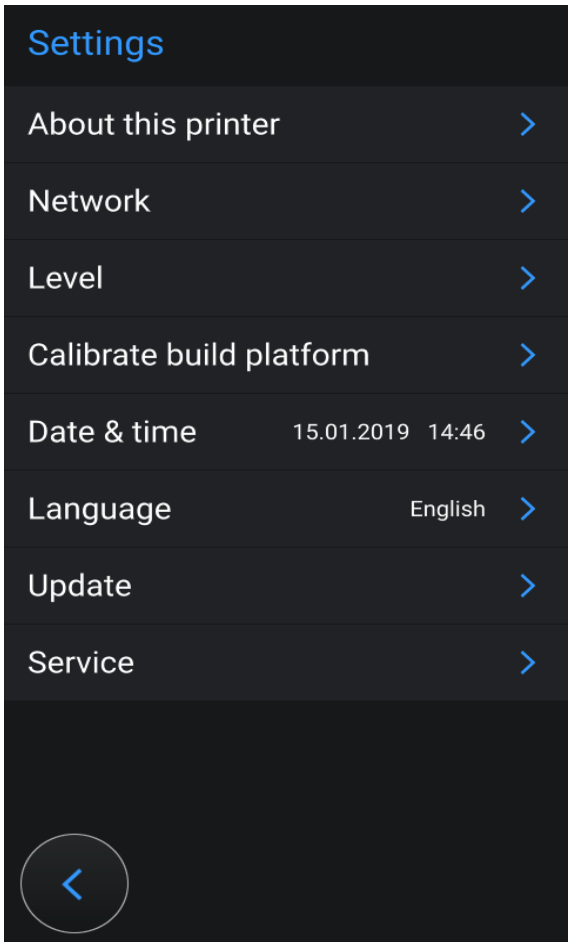
1. Before cleaning, turn off the printer and unplug it from the wall outlet.
2. Use a soft cloth moistened with mild detergent to clean the outside surfaces of the printer.
3. If the printer is not being used for a long period of time, disconnect the power plug from the AC outlet.

13 Settings

To access the printer settings, touch the settings button.

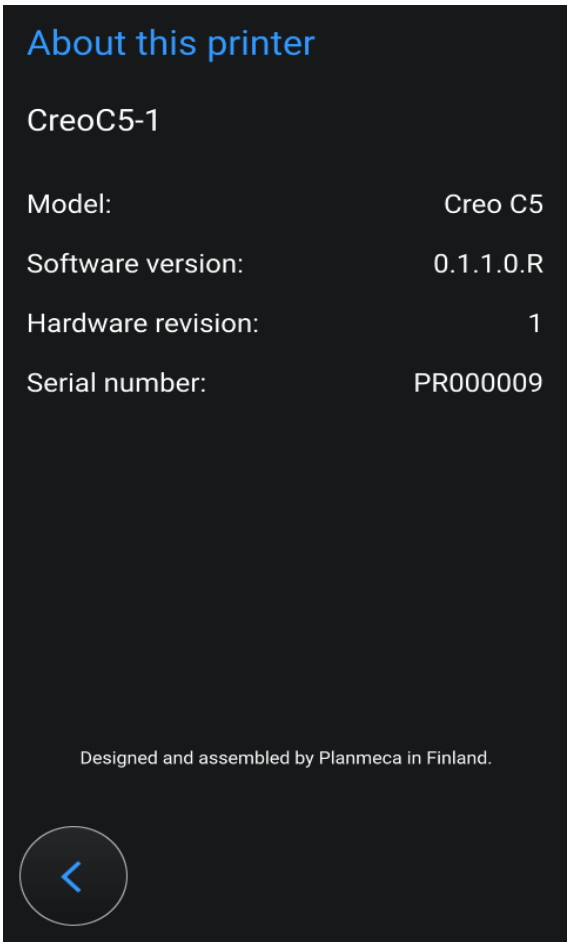
NOTE

All the menus may not be visible.


Settings
About this printer
Network
Level
Calibrate build platform
Date & time
15.01.2019 14:46
Language
English
Update
Service

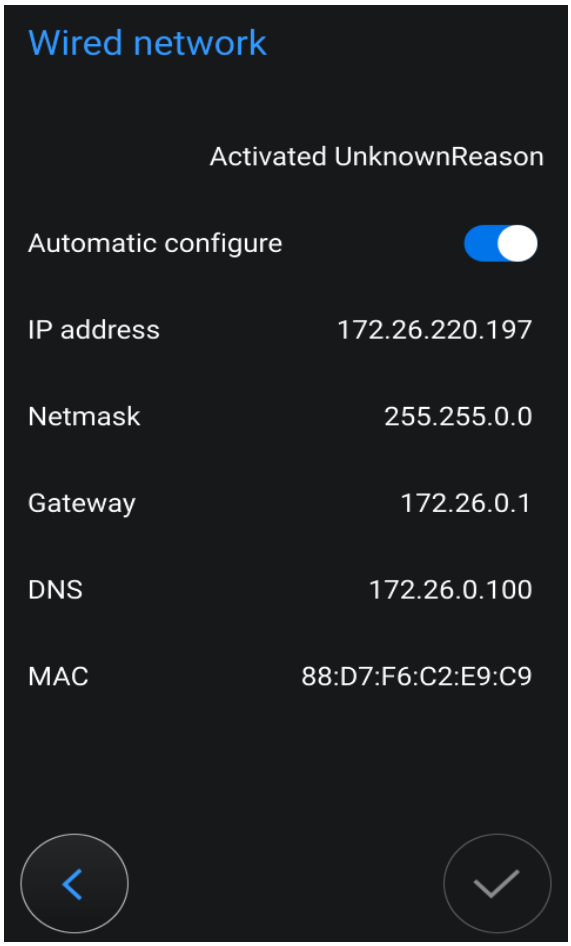
About this printer

In this menu the model, the printer's current software and harware versions and the serial number are displayed.



Wired network

In this menu you can view the settings of the currently wired network



14 Troubleshooting

14.1 Troubleshooting tables

14.1.1 Prints fail to attach to build platform

Possible cause	Solution
Build platform set too high	Check that the build platform homes correctly and the calibration gap is OK.
Build platform is not clean	Check that the build platform is completely clean and free of contamination, especially oils. Handling the build platform without gloves can leave traces of oil.
Not enough resin in the basin	Check that the resin is filled to the top of the build platform at minimum, plus the volume needed for the printed part.
Part base smaller than largest cross section	If you print a cone with the point to the build platform, for example, the print can detach when the force between the basin and the printed part becomes greater than the force holding the part to the build platform. • Change the orientation of the part. • Ifyou cannot change the orientation of the part, add supports to the part where the cross section starts to increase.
Resin-contaminated build platform or basin	If you use the build platform or basin with multiple different resin-types, the print can fail to attach to the build platform. Use only the appropriate resin for the build platform and basin pair.
Support is too long and thin	If the supports are long and thin enough to move during the print process, new support layers can fail to attach to the rest of the support and instead attach to the basin. Thicken the support in Creo C5 Studio, and try the print again.

14.1.2 Print cannot be removed from build platform

Possible cause	Solution
Resin contaminated platform or basin	If the build platform or basin has been used with multiple different resin-types, the print can adhere very strongly to the build platform. Use only the appropriate resin for the build platform and basin pair.

14.1.3 Print is misshapen or incorrect

Possible cause	Solution
Supports too long and thin	If the supports are long and thin enough to move during the print process, the printing of the support part can fail. Thicken the support in Creo Studio, and try printing again.
Basin not secured	A loose basin can cause a variety of artefacts in the print. Alternatively, a loose basin can allow one print to complete successfully, but cause failure in the next print job. Tighten the basin fixing screws. Check that the basin still pivots.
Resin-contaminated build platform or basin	If the build platform or basin has been used with multiple different resin-types, the print can deform due to resin coagulating, over-curing or under-curing. Over-curing and under-curing can both happen within the same print. Use only the appropriate resin for the build platform and basin pair.
Parts with angled walls	Non-solid parts with angled walls can cause the print to be "levered" off the build platform. Add supports to the angled face.

14.2 Troubleshooting tasks

14.2.1 Clearing printer of cured resin

The 3D print job can fail as a result of small fragments of cured resin being present in the printer, particularly suspended in the uncured resin in the basin and on the build platform. This issue is the result of a print layer separating from the basin improperly after curing, causing small fragments to come loose and interfere with the subsequent layers.

1. Move the build platform up and allow the uncured resin to drip into the basin.
2. Remove the build platform.
3. Remove the basin and drain the uncured resin through a funnel and filter back into the resin container. Uncured resin can be reused as long as it is filtered thoroughly.
4. Clean the basin and build platform, removing the failed print from the build platform at the same time.

   For more information, see sections "Cleaning build platform" on page 41 and "Removing, emptying and cleaning basin" on page 42.
5. Replace the basin and build platform.
6. Restart the print job.

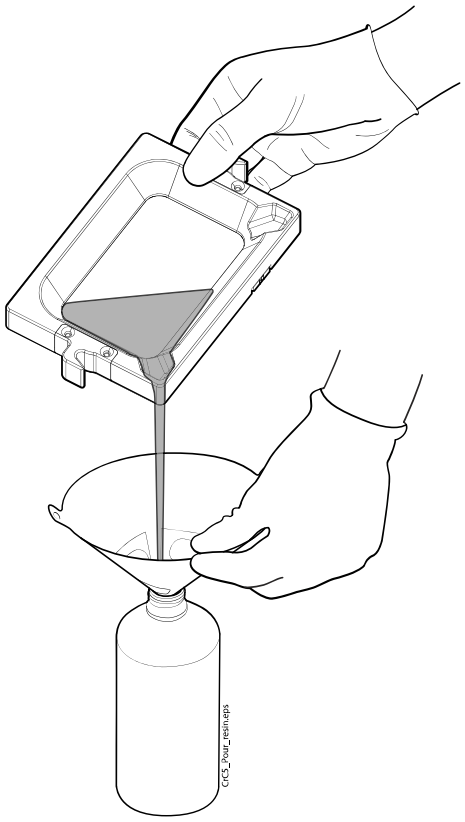
14.2.2 Clearing printer of misplaced resin layer

The 3D print job can fail as a result of a resin layer remaining behind on the basin floor after curing. The UV light can cure the resin layer and cause it to adhere to the basin floor instead of the previous print layers, which puts the subsequent build platform motions out of configuration.

If printing fails it is important to filter the liquid left in the basin and to clean the basin before the next use as the (partly) cured particles that were left on the basin or mixed into the resin could damage the display during printing.

1. Move the build platform up and allow the uncured resin to drip into the basin.
2. Remove the build platform.
3. Remove the basin and drain the uncured resin through a funnel and filter it back into the resin container.

   Uncured resin can be reused as long as it is filtered thoroughly.



4. Remove the failed resin layer from the basin as instructed in section "Removing, emptying and cleaning basin" on page 42.
5. Clean the basin and build platform.
6. Add back the filtered resin.
7. Replace the basin and build platform.
8. Restart the print job.

14.3 Slice-by-slice view in Creo C5 Studio

To minimise the chance of print failures, check the print job carefully in Creo C5 Studio before you run it in the printer.

Creo C5 Studio includes a slice-by-slice preview of the print job, showing each layer as a black-and-white image.

If the first image in this preview is black, it means the print model is not correctly flush with the build platform, and will not connect correctly during the initial printing process. Move the print model down in Creo C5 Studio so it contacts the build platform / printing area.

It is also very important to place sufficient connectors between the print model and the build platform, to ensure there is sufficient connecting surface area between the build platform and the model.

14.4 Radio and television interference

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, can cause harmful interference to radio communications. There is no guarantee, however, that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference in the following ways:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

The following booklet, prepared by the FCC, also includes useful information: *How to Identify and Resolve Radio-TV Interference Problems*. The booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under FCC rules.

14.5 Serial number capture

Save your printer’s serial number in the configuration. This helps Planmeca After Sales to provide you with assistance.

15 Technical specifications

Print technology	Liquid Crystal Display (LCD)
Resolution (XY)	47 µm
Layer thickness	25 -100 µm
Light source	LED
Guaranteed LED life	1,000 hours
Build volume / print area	120 mm x 70 mm x 100 mm (4.7 x 2.8 x 3.9 in.)
Power	100 - 240 V~ 50/60 Hz 400 W
Weight	32 kg (70.6 lbs)
Dimensions	30 cm (11.8)
Diameter	50 cm (19.7 in.)
Height, lid closed	90 cm (35.4 in.)
Height, lid open	
Minimum required clearances	Front: 50 cm (19.7 in.)
	Sides: 50 cm (19.7 in.)
	Rear: 50 cm (19.7 in.)
	Top: 50 cm (19.7 in.)
Operating temperature	15 - 25 °C (59 - 77 °F)

16 Disposal of device

Do not throw this electronic device into the trash when discarding. To minimise pollution and ensure utmost protection of the global environment, please recycle. For more information, please see the Waste from Electrical and Electronics Equipment (WEEE) regulations.

The approved printing resins in their fully cured form are not environmentally harmful and may be disposed with regular plastic waste. Residual waste material in its liquid state should be delivered to a collection point for waste material.

PLANMECA

Planmeca Oy | Asentajankatu 6 | 00880 Helsinki | Finland

tel. +358 20 7795 500 | fax +358 20 7795 555 | sales@planmeca.com | www.planmeca.com