



D30 II/D40 II

D30/D40

P30/P40

SheraPrint30/SheraPrint40



These operating instructions must be read and understood before operating the machine.

Rapid Shape GmbH | Roemerstr. 21 | 71296 Heimsheim | Germany
Phone +49 (0)7033 309 878 0 | Fax +49 (0)7033 309 878 40 | www.rapidshape.de

DOCR000007

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1 Safety information

1.1 Symbols

These operating instructions contain information which must be observed for your own personal safety as well as to avoid material damage. The instructions comprise the following explanations according to degree of risk.



Danger

Non-observance leads to serious injury or even death. High risk of hazard.



Warning

Non-observance can lead to serious injury or even death. Medium risk of hazard.



Caution

Can lead to minor or moderately serious injuries. Low risk of hazard.



Caution

Non-observance of the precautionary measures can lead to material damage of the equipment as well as the environment.



Attention

Indicates important information concerning the operation of the product or the respective work stage.



Instruction

It is essential to wear UV protective goggles.



Instruction

It is essential to wear protective gloves.

1.2 Safety instructions

Only specially trained personnel are permitted to perform/execute work with/on a Rapid Shape machine. For further information on the topic of training, please consult the Rapid Shape Support Team.

Rapid Shape is not liable for damage of any kind resulting from incorrect use or from the actions of non-authorized personnel.

Risk of electric shock



Danger

Danger to life from electric current!

Work at the machine's electrical equipment may only be performed by qualified personnel. The respective safety and VDE requirements need to be observed. Improper installation can cause material damage and personal injury for which the installer is liable.

Faulty connection, insulation faults, foreign objects (dust, liquid due to improper installation environment) or lack of grounding can cause housing parts to carry voltage. When touching live parts, there is a danger to life from electric shock. Therefore:



- Work at the machine's electrical equipment may only be performed by qualified personnel.
- Devices with damaged power cable, damaged insulation and/or lack of grounding need to be separated from the power network (removing the mains plug) and be repaired by qualified personnel before putting into operation again.
- Keep humidity away from live parts. This may cause a short circuit.
- Before working at live parts of the electrical equipment and operating material, establish a voltage-free condition and ensure that this condition will be kept for the duration of the work.
- Never bypass or disable fuses.
- Connect the power cable to the socket closest to the machine.
- Only operate the machine with the supply voltage intended for the machine.
- Only connect the machine to a proper earthed socket.
- The mains plug must be freely accessible at all times. In case of an emergency, a complete separation of the machine is effected by unplugging the mains plug.
- In the event of prolonged absence or bad weather, always switch off the machine at the main switch and separate it from the power supply by unplugging the mains plug.

Warning against dangerous UV radiation



Caution

Danger of injury from UV radiation!

Printing and calibration take place under the influence of UV radiation. UV radiation can cause permanent damage to eyes and skin if exposed for a long time without suitable protective equipment.

Therefore, during printing and calibration, work at the machine may only be performed when wearing UV protection goggles.



- Printing process should be carried out when the protective hood is mainly closed.
- During calibration of the exposure unit, the UV protection goggles, supplied in the scope of delivery, must be worn.
- The material reservoir may only be used when it's filled with sufficient amount of material.
- It's recommended to wear the UV protection goggles during any operation at the machine.

Warning against hand-related injuries



Caution

Danger of injury to hands due to moving parts!

The machine consists of accessible moving parts which can cause light hand injuries from bruising and trapping. There is a risk of bruising and trapping due to moving of the building platform. Only personnel instructed in the machine may operate the machine.

For this reason, the respective warnings must be observed and adhered to when working at the machine.



- During printing process and manual moving of the building platform, no fingers or hands are allowed to be located in or inserted into the machine.

Warning against environmental influences



Caution

The machine's electrical as well as mechanical components are only configured for certain environmental influences. Non-observance of the prescribed environmental conditions can cause damages to the machine.

For this reason, the respective warnings must be observed and adhered to before commissioning and during operation.



- Protect the machine against humidity, dripping water and splash water.
- Do not place any filled objects, such as drinks for example, in the immediate vicinity of the machine.

- Do not position the machine near heating.
- Do not expose the machine to direct sunlight.
- Do not operate the machine in damp rooms.
- Only use the machine in temperate climates and not tropical climates.
- Do not place any open flames, such as candles for example, on top or near the machine.

Warning against overheating



Caution

The machine's electrical as well as mechanical components are only configured for a certain ambient temperature.

For this reason, the respective warnings must be observed and adhered to before commissioning and during operation.



- Never install the machine in a cupboard or shelf unit with insufficient ventilation.
- Never cover the ventilation vents of the machine.
- Maintain a distance of at least 200mm on every side so that the generated heat can dissipate.

Warnings against dangerous substances



Warning

Chemicals required for the manufacture, maintenance and care must be handled correctly and under observance of the relevant regulations and instructions for use applicable to them.

For this reason, the handling of these chemicals must be carried out properly and in compliance with the applicable regulations and instructions for use. The manufacturer's specifications must be observed.



- **Read the safety data sheet of the manufacturer!**
- It's recommended to wear suitable protective clothing. (UV protection goggles, protective gloves, if necessary other protective clothing)
- The metering stipulations of the manufacturer must be observed.

Warning against harmful vapors



Warning

The materials used for printing can emit vapors which irritate the respiratory paths and/or can lead to dizziness.

For this reason, when working with the printing materials, respective protective clothing must be worn. A sufficient fresh air supply has to be assured.



- **Read the safety data sheet of the manufacturer!**
- It's recommended to wear suitable protective clothing. (breathing protection, if necessary other protective clothing)

2 General information

2.1 Conformity declaration

With the EC conformity declaration accompanying the machine, the manufacturer, Rapid Shape GmbH, declares that the designated machine was developed, constructed and produced in accordance with the relevant directives and their standards.

2.2 Area of application of the operating instructions

These operating instructions are valid for the following machines:

Machine	Type	Prod. Date
3D printer system	D30 II/D40 II D30/D40 P30/P40 Sheraprint30/SheraPrint40	from 05.2017

2.3 Intended & non-intended use

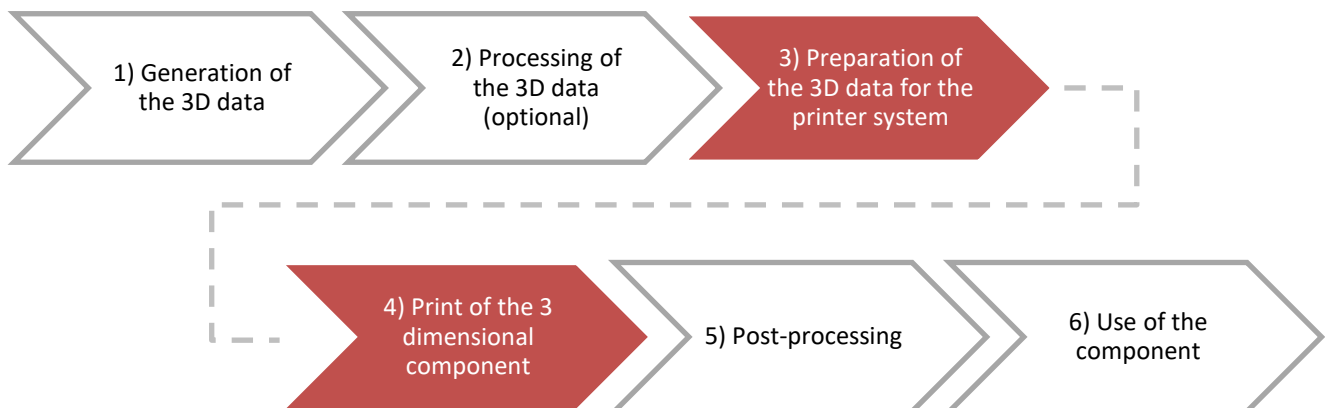
The Rapid Shape 3D printer system is intended for printing of three-dimensional objects with printing materials designed for the respective wavelength and the DLP method in additive manufacturing method. The specified digital workflow (see below) must be observed. Work at the machine without permission and sufficient instruction is forbidden.

The printer system is to be used in a tempered indoor area (installation conditions see technical details – chapter 3) and in compliance with the prohibition-, warning- and mandatory signs attached to the machine as well as the regulations and safety instructions described in this manual.

Only printing materials which are suited for the respective wavelength and the DLP printing method, and which have a flash point of >80°C, are allowed to be used.

Operating the machine within explosive atmospheres, using explosive printing materials, operating the machine outdoors or in wet areas or without UV protection goggles as well as non-observance of the operating instructions is forbidden.

The operator is liable for damages resulting from the non-compliance of the intended use and the prohibition-, warning- and mandatory signs only. If the machine is to be used in a manner not specified by the manufacturer, the protection supported by the machine may be affected in a negative way.

Digital workflow (schematic representation):

These operating instructions detail the process up to stage 3 and 4.

Stage 1, 2, 5 and 6 as well as the photosensitive print materials for stage 4 are not covered by the delivery scope of the 3D printing system, but can all be acquired from Rapid Shape or its partners. Should you have any queries, please contact our sales team.

2.4 Duties - the operating company / machine operator

It is essential to observe the instructions given in these operating instructions

- It is essential to observe the fundamental safety instructions in order to assure perfect as well as safe operation of the machine.
- These operating instructions contain all the important information required for a safe operation of the machine.
- All persons that operate/work on this machine must have read and understood these operating instructions.

Responsibility of the operator (the operating company)

The operating company is obliged to

- to instruct the person working on the machine in its operation.
- inform the person working on the machine about safety in the workplace as well as the generally applicable accident prevention regulations.
- to provide the person working on the machine with the operating instructions.
- A brief cleaning of the machine must be undertaken after every printing operation. See Chapter 8.

Responsibility of the person working on the machine (the machine operator)

Persons who operate this machine are obliged to

- observe safety in the workplace as well as the generally applicable accident prevention regulations.
- to observe and follow the instructions and safety information given in these operating instructions.

We accept no liability for machine damage or injury to the operating personnel if these operating instructions are not observed.

3 Technical details

Description	D30 II	D40 II
Dimensions (WxHxD)	480x690x410mm (closed) 480x1000x410mm (opened)	
Weight	44kg	49kg
Ambient temperature	+15 to +40°C	
Air humidity	max. 70%	
Storage	In dry and tempered rooms (-15°C to +70°C)	
Sound pressure level*1)	< 61 dB (A)	
Calibration value	Set point low: 10,1 W/m ² (tolerance -0,1/+0,4 W/m ²) Set point high: 20,1 W/m ² (tolerance -0,1/+0,9 W/m ²)	
Wavelength	385nm	
Interface electrics	100-240V AC, 50/60Hz, 260W	
Interface ethernet	10/100 Mbit/s	
Interface media	USB-Ports USB 2.0	

All values are approximate.

*1) In accordance with DIN EN ISO 11201:2010-10

3.1 Conversion / spare parts / repair

Every technical alteration of whatever kind to the machine is forbidden. Only trained Rapid Shape GmbH personnel or personnel trained by the company Rapid Shape GmbH are permitted to carry out repairs to the machine. If repair is required, please contact the Rapid Shape Service Team.

3.2 Delivery scope

Amount	Article
1	3D printer system
1	Starter kit
<i>Optional</i>	<i>Accessories package (will be offered and sold separately)</i>

The starter kit contains tools and consumption parts required for operating the machine (please consult the offer for details).

3.3 Components

3.3.1 Front view

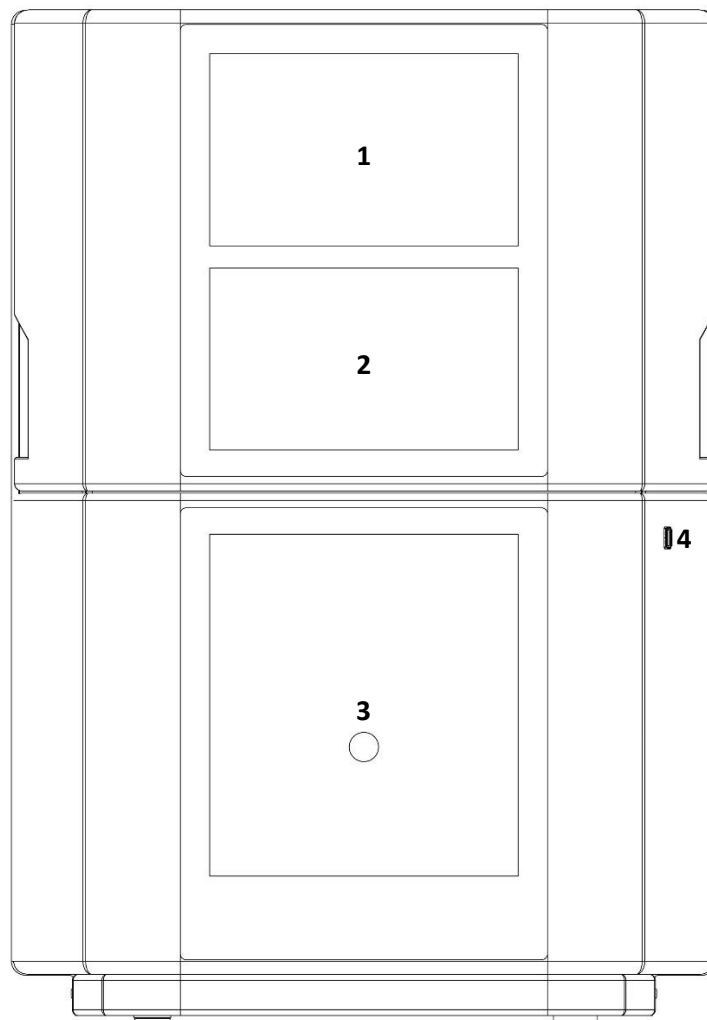


Figure 1

- | | |
|----------|----------------------------|
| 1 | Touch screen / Main screen |
| 2 | Inspection window |
| 3 | Automatic hood opening |
| 4 | USB port |

3.3.2 Rear view

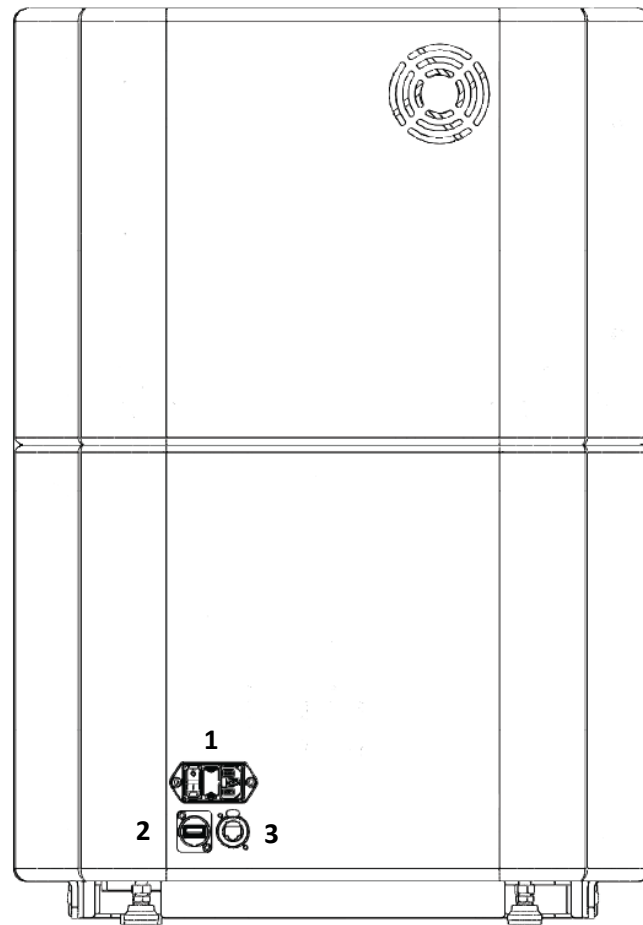
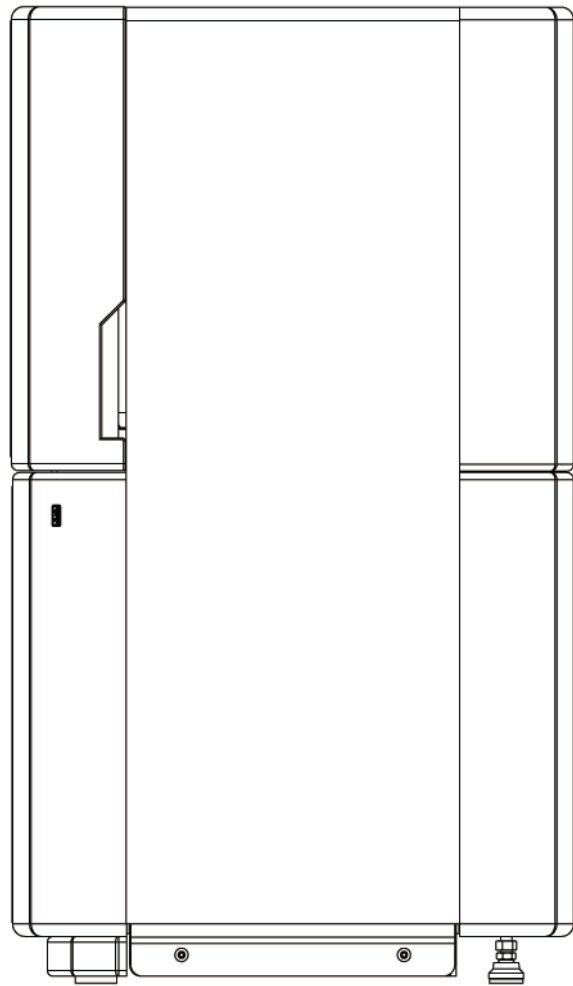


Figure 2

- | | |
|---|--|
| 1 | 100-240V connection incl. mains switch |
| 2 | USB port |
| 3 | Ethernet connection |

3.3.3 Side view



4 Transport



Caution

Non-observance of the precautionary measures can lead to material damage of the equipment as well as the environment.



Caution

Loading and unloading, as well as positioning/setting up the machine, may only be performed by qualified personnel. Always lift and transport the machine in twos. When using lifting devices, the lifting device's weight must comply with the weight of the machine (see technical details - chapter 3). The requirements of the machine's installation site must be observed.

4.1 General instructions

The machine may only be transported in the packaging supplied and with sufficient protection against tilting over.

Store the transport packaging for future use (change of location, maintenance, repair etc.). Returns without original transport packaging cannot be accepted.

4.2 Transport damage

After receipt of the delivery, carefully check the transport packaging as well as the product supplied for any damage that could have occurred during transport. Transport damage is to be reported to the forwarding agent and Rapid Shape immediately.

5 Preparations

5.1 Requirements for the installation site

In order to ensure a smooth and trouble-free operation of the 3D printer system, please observe the following stipulations for the machine's installation site:

-
- Set up in a room separated from other permanent work
 - Set up only in a dust-free area
Beware of milling dust
 - A sufficient supply of fresh air is to be assured in the room
In this respect, also always observe the stipulations of the respective material manufacturers (safety data sheet)
 - The machine as well as the materials are to be protected from exposure to direct sunlight
 - The room is to be equipped with UV-protected lighting
 - Windows are to be UV protected / shaded or fitted with UV protective film
 - A **strong** foundation for setting up the machine
 - Room requires LAN network and internet connection for service purposes
 - *Optional: Room with fresh water supply and sink unit*
-

-
- *Optional: Room with compressed air supply*
 - *Optional: Set up in a temperature-controlled room with constant temperature $\pm 2^{\circ}\text{C}$ (optimal)*
In this respect, also always observe the stipulations of the respective material manufacturers
-

5.2 Additional absolutely needed equipment

In order to ensure a smooth and trouble-free operation of the 3D printer system, the following items are required:

-
- PC for generating the printing data (see chapter 5.4)
 - Post exposure unit for hardening the components
In this respect, also always observe the stipulations of the respective material manufacturers!
Observe safety data sheets!
Observe biocompatibility requirements!
 - Isopropanol or ethanol (at least 10l)
In this respect, also always observe the stipulations of the respective material manufacturer!
Observe safety data sheets!
Observe biocompatibility requirements!
 - Disposable gloves in different sizes
 - Standard glass cleaner (streak-free)
 - Roll for paper toweling
 - Waste containers for paper toweling (sealable to prevent odor)
 - Closable, light-proof cabinet for material reservoirs and material containers.
 - Table workplace measuring approx. 100 cm in width to remove the components from the platform as well as to carry out any post-processing
 - *Optional: Protective gas supply with corresponding gas fixtures for the post exposure unit*
In this respect, also always observe the stipulations of the respective material manufacturer!
Observe safety data sheets!
Observe biocompatibility requirements!
 - *Optional: Ultrasound cleaning unit. For several materials with several cleaning containers as required*
In this respect, also always observe the stipulations of the respective material manufacturer!
Observe safety data sheets!
Observe biocompatibility requirements!
 - *Optional: Table-magnifier lamp*
 - *Optional: Compressed air supply with compressed air pistol, incl. upstream pressure reducer to 2 bar*
-

5.3 Materials

Current information on materials as well as safety data sheets can be obtained directly from the material manufacturers. As regards Rapid Shape materials, our contact details are as follows:

Company name:	Rapid Shape GmbH		
Address:	Römerstraße 21		
Town:	71296 Heimsheim		
Telephone:	+49 (0) 7033 309878-0	Fax:	+49 (0) 7033 309878-40
Internet:	http://www.rapidshape.de	Email:	service@rapidshape.de

5.4 IT requirements

A computer is required to generate the print data for the machine. The following points are to be observed in this respect.

5.4.1 PC hardware

In order to use the slicing software from netfabb, you require a computer that fulfils the following requirements:

-
- Computer for CAD design, nesting and slicing
Quad core CPU (Intel Core i5 or i7) @ 2.50 GHz
At least 4GB main memory (8GB recommended)
1GB+ free hard disc memory
Windows 7 32-bit/64-bit or higher
LAN connection
Internet connection
 - Network connection between computer and machine
(e.g. via router)
-

5.4.2 PC software

The following software must be installed on the computer intended for use.

-
- Operating system Windows 7 32-bit / 64-bit (optional) or higher
 - TeamViewer **Host** (as from version 10)
 - netfabb Rapid Shape Version (delivered on the USB stick)
-

For more information on the software used:

- <http://www.microsoft.com>
 Here you can obtain information on the operating system used
- <http://www.teamviewer.com>
 Here you can obtain information on trouble-shooting or the latest updates for TeamViewer.
- <http://www.microsoft.com>
 Here you can obtain all information required for the slicing software netfabb.

5.4.3 IP address

The default setting for the system is DHCP (dynamic IP address).
 Should a static IP address be used, this can be set in the menu under "Setup"
 (see chapter 7.12).
 Should you require details of your IP address please contact your administrator.

5.4.4 Internet access / TeamViewer port

-
- The computer to be used for netfabb requires internet access in order to obtain regular software updates and material libraries
 - Moreover, this computer requires approval to use the TeamViewer program so that, if required, the service team can access the computer.
-

6 Getting started

Before putting into operation it is essential to have read in full and understood the chapter Safety information. Should there be any queries or uncertainties, please immediately contact the Rapid Shape Service Team.

6.1 Unpacking the machine



Caution

Note the transport instructions described in chapter 4.

-
- (1) Grip the machine with both hands and carefully remove the machine out of the packaging. Attention: Do not grip the machine at the movable protective hood!
-

6.2 Setting up the machine



Caution

Note the requirements for the installation site described in chapters 1.2 and 5. A setting up of the machine may only be performed by qualified personnel. When transporting the machine, ensure that no material reservoir is inserted in the machine and that the protective hood has been closed properly.

-
- (1) Position the machine onto a stable ground.
 - (2) When positioning the machine at its definite installation site, the machine has to be positioned fully onto its four feet in order to prevent the machine from external vibration influences.
-

6.3 Connecting the machine



Danger

Non-observance leads to serious injury or even death. High risk of hazard.



Danger
Danger to life from electric current!

Work at the machine's electrical equipment may only be performed by qualified personnel. The respective safety and VDE requirements need to be observed. Improper installation can cause material damage and personal injury for which the installer is liable. (see chapter 1.2, Risk of electric shock)

-
- (1) Connect the mains plug at the machine's rear side. Avoid tripping hazards due to cables lying around.
 - (2) *Optional: Connect the network cable at the machine's rear side.*
Internet connection required to obtain optimal support.
-

6.4 Starting the machine



In order to make the operation of your machine even more comfortable, supporting messages will appear at some operating points. For optimizing your printing processes and printing results, each message will be displayed with a recommended action.



Caution

Danger of injury to hands due to moving parts!

The machine consists of accessible moving parts which can cause light hand injuries from bruising and trapping. There is a risk of bruising and trapping due to moving of the building platform. Only personnel instructed in the machine may operate the machine.

- (1) If open, close the protective hood.
- (2) Switch on the machine at the main switch on the machine's rear side.
- (3) The machine starts up:
 - The display indicates „starting machine“.
 - The z-axis carries out a reference run towards the upper end position (Attention: risk of bruising and trapping).
 - The operating system starts up.
 - The operating panel starts up.



When the machine is starting up, following supporting messages will appear:

- Information concerning the material reservoir
- Available updates (will not appear if option “Automatic Updates” is deactivated, see “Setup” -> “Service” -> “Customer”)
- General machine information (e.g. license status)

6.5 Opening / closing the machine



Caution

Danger of injury to hands due to moving parts!

The machine consists of accessible moving parts which can cause light hand injuries from bruising and trapping. There is a risk of bruising and trapping due to moving of the building platform. Only personnel instructed in the machine may operate the machine.

The machine is equipped with a protective hood which can be opened and closed automatically or manually.

Automatic:

- (1) Press the button „Automatic hood opening“. The hood will be opened automatically.
- (2) For closing the hood, press the button “Automatic hood opening” again.

Manual:

- (1) Press the hood upwards (opening) / downwards (closing) at the lateral gripping areas.

6.5.1 Automatic hood closing

In order to prevent the materials from curing and dust influences, the protective hood will close after a certain amount of time:

- During printing after 30 seconds
- In main menu after 60 seconds



The function of the automatic hood closing is set as standard ex works and should prevent materials from being exposed to external influences during long opening times of the hood. The function can be deactivated under "Setup" -> "Service" -> "Customer".



During user interactions, such as e.g. calibration or reservoir change, the automatic hood closing will not take place, although function is set active.

If the button „Automatic hood opening“ will be pressed during automatic closing, the hood will open immediately.

6.6 Printing the first test job



Caution

Danger of injury from UV radiation!

Printing takes place under the influence of UV radiation. UV radiation can cause permanent damage to eyes and skin if exposed for a long time without suitable protective equipment. Therefore, during printing, work at the machine may only be performed when wearing UV protection goggles.



- Printing process should be carried out when the protective hood is mainly closed.
- The material reservoir may only be used when it's filled with sufficient amount of material.
- It's recommended to wear the UV protection goggles during any operation at the machine.



Caution

Danger of injury to hands due to moving parts!

The machine consists of accessible moving parts which can cause light hand injuries from bruising and trapping. There is a risk of bruising and trapping due to moving of the building platform. Only personnel instructed in the machine may operate the machine.

- During printing process, no fingers or hands are allowed to be located in or inserted into the machine.

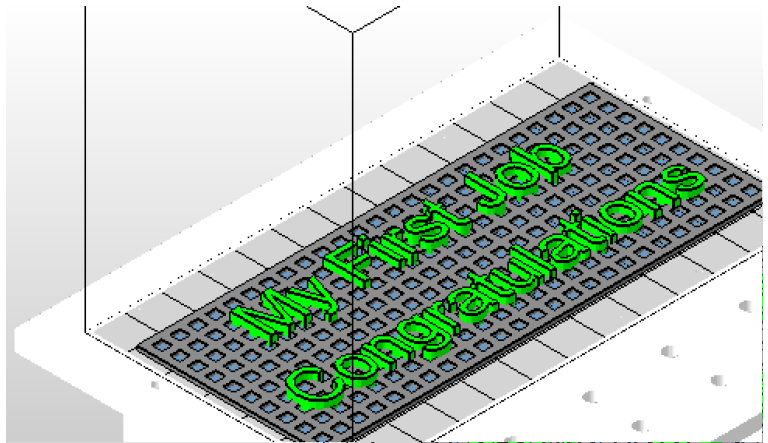
After the machine has been started up, the main menu will be displayed.

-
- (1) Fill in the required amount of material into the material reservoir. Pay attention to the maximum and minimum filling level.
 - (2) Open the machine by pressing the button “Automatic hood opening” or by manually open the hood.
 - (3) Insert the filled material reservoir into the machine.
 - (4) Insert a fully cleaned building platform into the machine and fix it.
 - (5) In order to start your job, select: „More Functions“ -> „Start Testjob“ -> „My first job“ -> „Start“
-



The detailed description of the machine operation is described in chapter 6.7.8.

While the job is being printed, you can already carry on with further setting up of the digital workflow. Once the print job has been completed, please check the result. Should you find that the print result deviates from the desired result, please contact the Service Team.



6.7 Netfabb software



The following sections provide a brief overview of the netfabb software. However, we would like to point out that this is just one small part of netfabb. Should you require a more detailed explanation, please consult the netfabb operating manual:

- callable after installation in the netfabb program directory
- or under <http://www.netfabb.com>



The software netfabb is required for preparing and sending the print jobs to your 3D print system.

6.7.1 Installation

Install the netfabb version provided on the USB stick supplied. Please pay attention to the installation instructions on the USB stick, these provide instructions and may also include adjustments.

6.7.2 Opening netfabb

- (1) Open netfabb.
- (2) The starting page will be opened automatically.

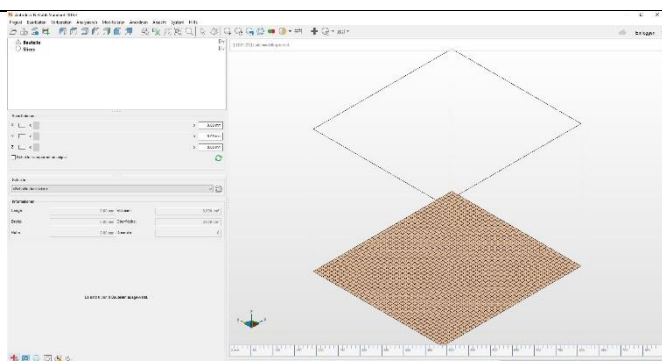


Figure 3

6.7.3 Creating machine workspace

- (1) Click on the button “Load machine workspace” (see action bar)
- (2) Select your printer and confirm your selection by pressing “OK”.



Tip: If you have selected your printer, you

- can add your selection to the favorites list by right-click (add to favorite, the favorites will always appear at the top of the list).
- can set the selected machine workplace as starting workspace (start with netfabb). This workspace will be

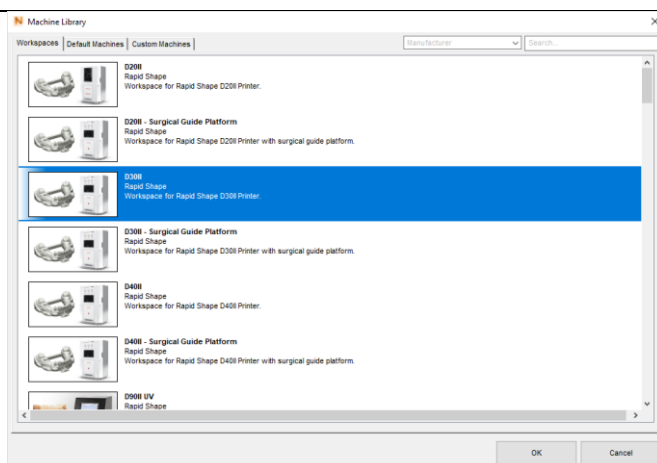


Figure 4

automatically loaded when starting netfabb.

- (3) The machine workspace will be loaded.
(This will take some seconds.)
- (4) The loaded machine workspace will be displayed.

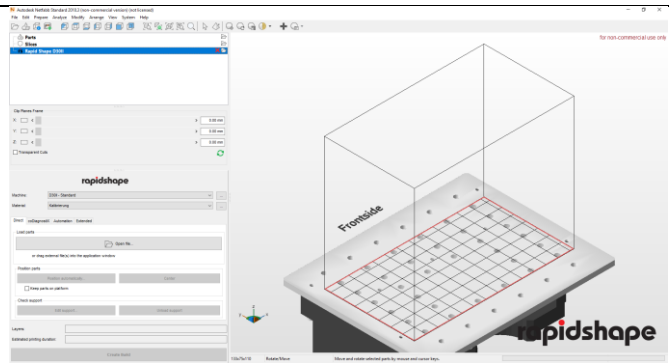


Figure 5

6.7.4 Selecting a workflow

A workflow describes the procedure of preparing and printing the 3D data. Depending on the netfabb version, different kind of workflows can be selected.

coDiagnostiX

For printing jobs which have been created with the software coDiagnostiX, the additional tab “coDiagnostiX” can be used. The tab enables to load the printing jobs directly from the source software and to position them onto Surgical Guide Platforms in netfabb.

6.7.5 Adding/ changing a machine

If you are using netfabb for the first time or you have received a new machine, you have to add your machine in netfabb:

- (1) Click on the button “...” right to the display area of the machine type.
- (2) The machine library will be opened and already entered machines will be displayed.
- (3) Adding a machine: In order to add a machine, click on the button “Add machine”.
- (4) Edit machine: In order to edit an already existing machine, click on the button “Edit machine”.
- (5) Fill in the gaps with your machine’s data or edit the already entered data:

- *Machine name*: freely selectable
- *Machine type*: select
- *Scaling XY*: see USB stick
- *IP Address*: enter (only required in combination with a network)
- *Username*: freely selectable (factory setting: rapid)
- *Password*: freely selectable (factory setting: shape)

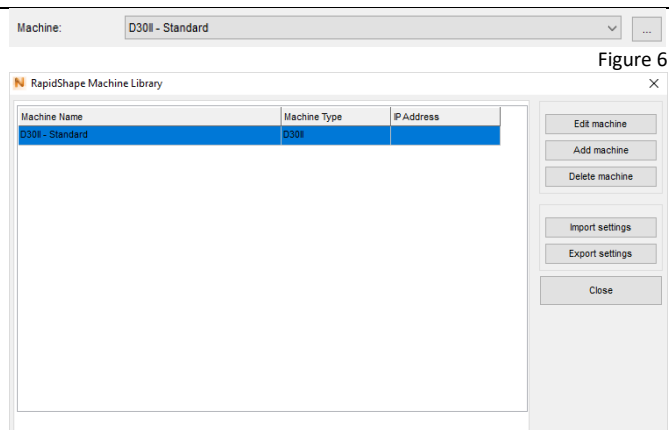


Figure 6

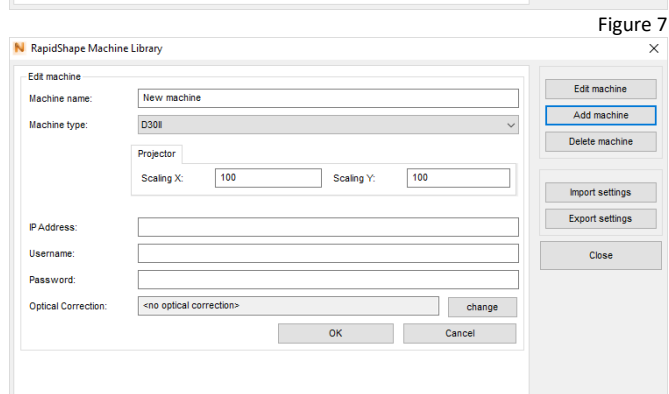


Figure 7

- **Optical Correction** (only applicable at machines with optical correction): enter; The values of the optical correction are adapted to your machine. Click on the button “change” and select the folder (USB stick) where the file has been saved. Copy the values by double clicking.

- (6) Save your changes by clicking on the button “OK”.

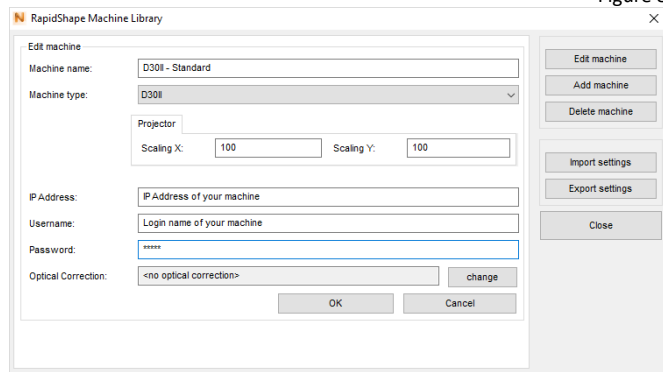


Figure 9



Only those machine types can be added and adjusted which are selected in the current active machine workspace. (see chapter 6.7.3)

6.7.6 Adding a material

If you are using netfabb for the first time or you have received a new machine/material, you have to add a new material in netfabb:

- (1) Click on the button “...” right to the display area of the material.
- (2) The machine library will be opened and already entered materials will be displayed.
- (3) Adding a material: In order to add a material, click on the button “Add new”.

- **Name:** freely selectable (Note: A material name can be set only once.)
- **Machine type:** select
- **Material:** select
- **Parameter set:** select
- **Layersize:** select
Note: The smaller the layersize is, the more precise the print result will be (at longer printing time).

- (4) Edit material: In order to edit an already existing material, click on the button “Edit”.
- (5) In order to edit the material parameters, e.g. for testing purposes, the following parameters can be adjusted (may vary depending on the material type):

Object properties:

- **Overcure:** prolongs/shortens the exposure time
- **Support Width:** only for two-

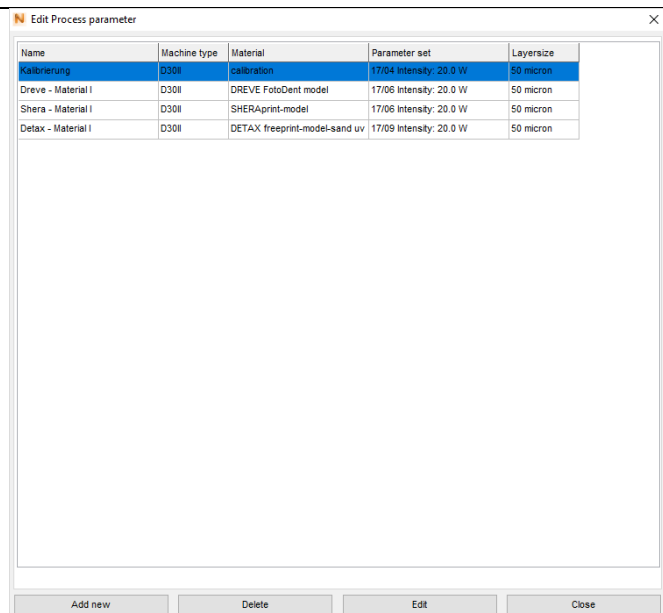


Figure 10

- dimensional support files (*.s.stl)
- *Offset*: changes the size of the component towards X- and Y-direction by the set absolute value
- *Shrinkage*: changes the size of the component towards X- and Y-direction by the set percentage value
- *Z-Compensation*: changes the size of the component by the set absolute value

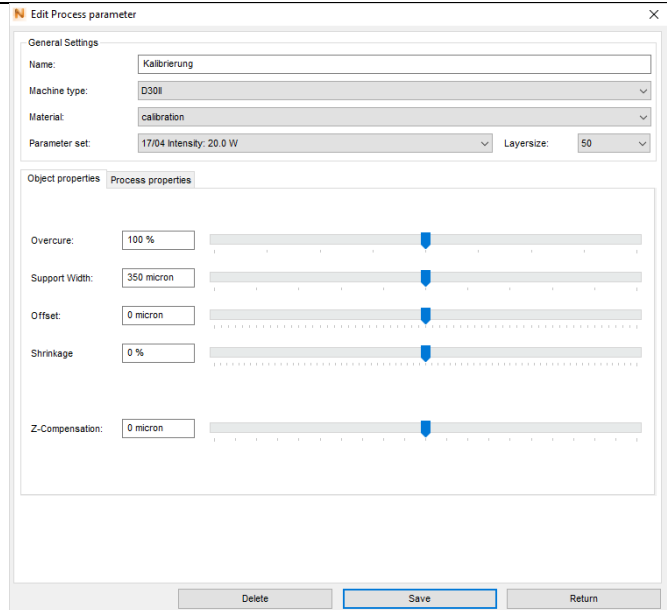


Figure 11

Process properties:

- *Burn in factor*: prolongs/shortens the burning in time of the first layers
- *Separation Force*: decreases/increases the separation force when loosening the building platform from the material reservoir after having burned in the layers

Note: It's possible that not all displayed parameters are available.

- (6) Save your changes by clicking on the button "OK".

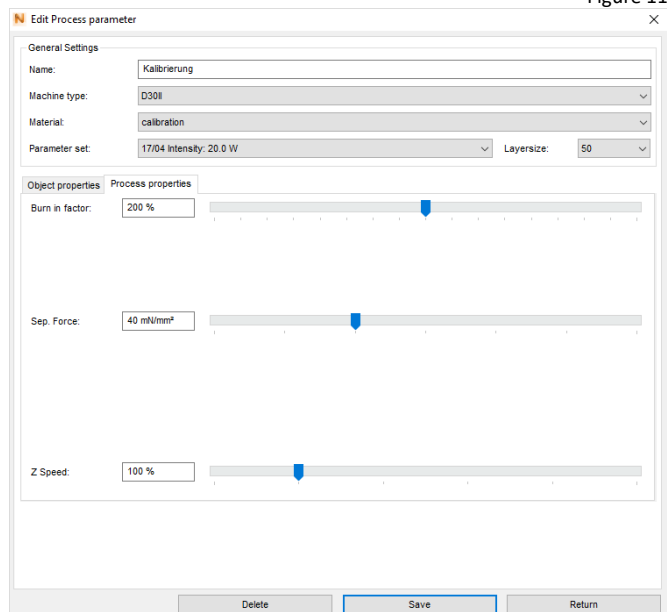


Figure 12



In case of a corresponding maintenance contract, the material parameters will be updated on a regular basis. In case of an update of already existing materials, the existing *parameter set* will be left unchanged.

6.7.7 Settings

In order to optimize netfabb as well as the slicing process, the following settings adjustments are necessary:

- (1) Click on the tab “Extended” below the display area of the material.
- (2) Click on the button “Engine settings”. A window for the engine settings will be opened. The following settings can be adjusted:
 - *Avoid platform borders*: increases/decreases the building area on the building platform (red lines)
 - *Part orientation while import*: selection between
 - **Keep part position** (positions the component onto the marked position when loading)
 - **Move to origin** (positions the component to zero position)
 - *Subvoxelization*: increases/decreases the accuracy of calculation when slicing
Note: A higher value prolongs the slicing- and printing process extremely (the printing result may not necessarily become better).
Recommended setting: Double separation (2x2x2)
 - *Kiosk mode password*: Password can be entered for secured printing jobs (optional)
 - *Transfer ID*: Here you can enter which netfabb will create print jobs for which printer (helpful in environments with more printers)

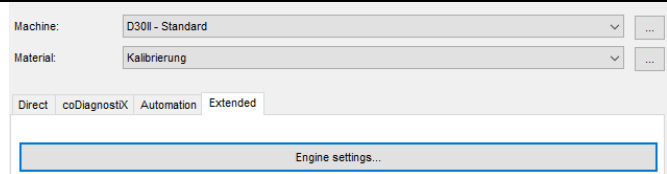


Figure 13

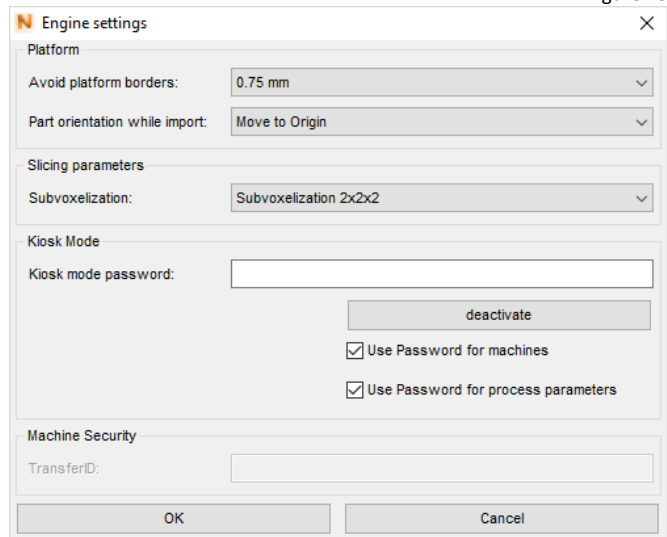


Figure 14

- (3) Save your entries by clicking on “OK”.

6.7.8 Loading components

In order to print 3D models, so called *.stl files need to be loaded into netfabb:

- (1) Click on the button “Open file...”.
- (2) Open the file structure from which you want to upload your print job as *.stl file.
- (3) Click on your print job and confirm your selection by clicking on the button “Open”.
- (4) The *.stl file will be uploaded. Depending on the size and complexity of the job, the uploading process may take some time.

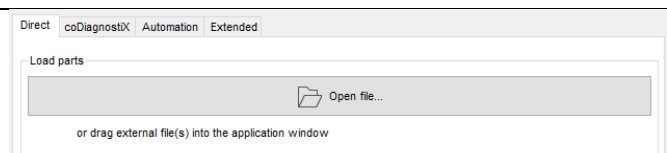


Figure 15

- (5) When the file has been fully loaded, the model will be displayed on the building platform.

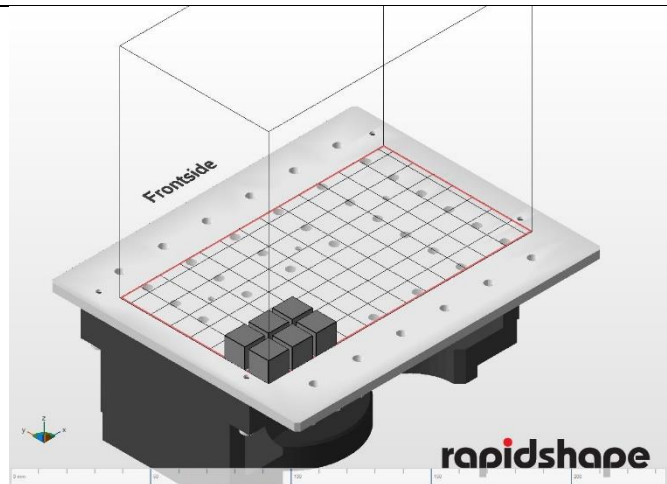


Figure 16

6.7.9 Positioning components

The uploaded models can be positioned on the building platform:

- (1) Mark all the models on the building platform.
- (2) Click on the button "Center". The models will be positioned in the middle of the platform.
- (3) Checkmark "Keep parts on platform". This way, the models will be positioned directly onto the platform.
(If you do not checkmark, the component can be moved into Z-direction.)

Attention! Components, which are not directly positioned onto the platform, cannot be printed. (Exception: Usage of support structures, see chapter (Ausnahme: Verwendung von Supportstrukturen, Kapitel 6.7.10)



Figure 17

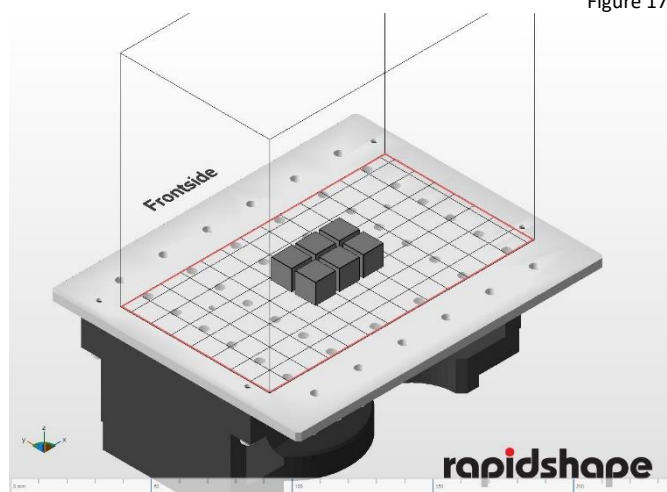


Figure 18

- (4) When clicking on "Position automatically...", the minimum distances between the components and other settings can be set.

6.7.10 Checking supports

Depending on the printing jobs, support structures may be necessary in order to perform the job. Support structures can be created and adjusted manually in netfabb:

- (1) Mark the model for which a support structure should be created.
- (2) Click on the button "Edit support...". A window with the following support possibilities will be displayed:
 - *Quick Support*: Creating a support automatically
 - *Import external support*: Load the support as an external file
 - *Import external support for multiple parts*: See above
 - *Create custom support*: Manual post-processing of the created support (Quick Support)

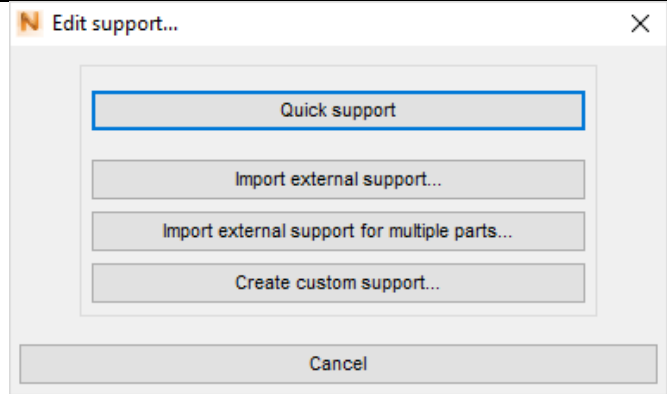


Figure 19

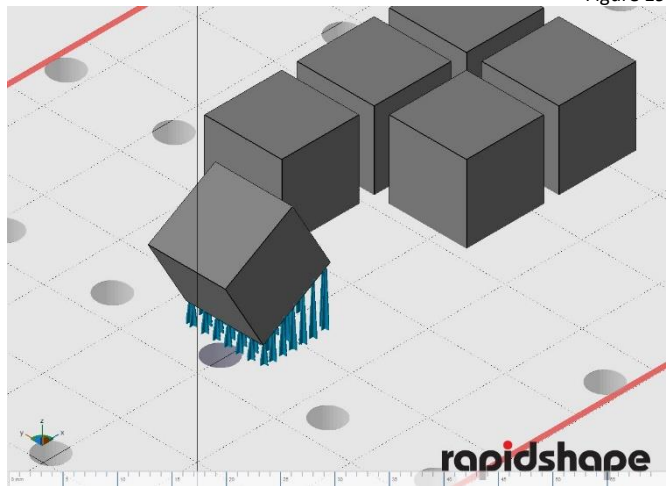


Figure 20

6.7.11 Slicing

The slicing process generates the print data for your printer system (cuts the model into individual layers):

- (1) Click on the button "Create Build".
- (2) The slicing process will be performed automatically. Depending on the size and complexity of the job, this may take some time.
- (3) After the slicing process has been performed successfully, a new window will be opened (Job Preview).
- (4) In the displayed job preview, you can check and save the printing data and the individual layers (e.g. for later sending via USB stick) and/or you can directly send the printing data to your printer - see chapter 6.7.12-6.7.13.

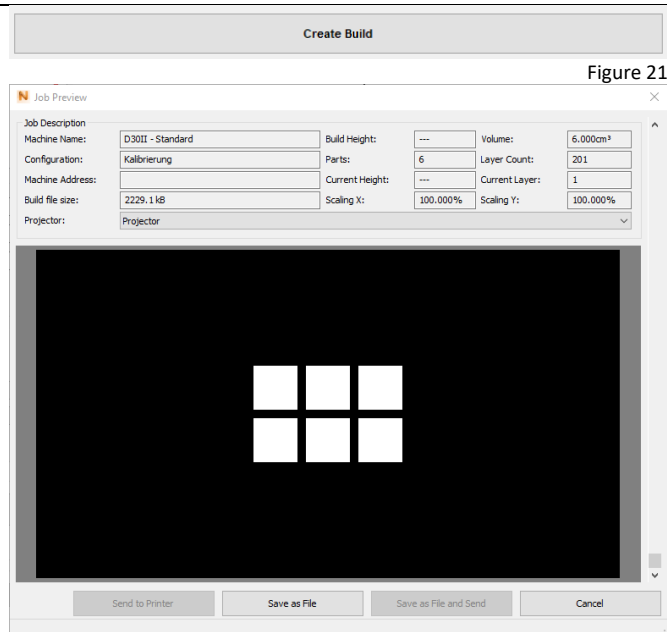


Figure 22

6.7.12 Transferring printing data via network

Transferring the printing data via network is the simplest and fastest method (recommended by Rapid Shape):

- (1) Prerequisite for transferring the printing data via network are:
 - The IP address of the machine has to be set in the machine settings in netfabb.
 - The netfabb computer has to be able to contact the machine: Port 20, 21 not blocked, test with ping successful (If you need help, please contact your system administrator.).

(2) Job Preview:

- *Send to Printer:* Will send the file to the printer, will not save the file on the computer
- *Save as File and Send:* Will send the file to the printer and will save the file on the computer

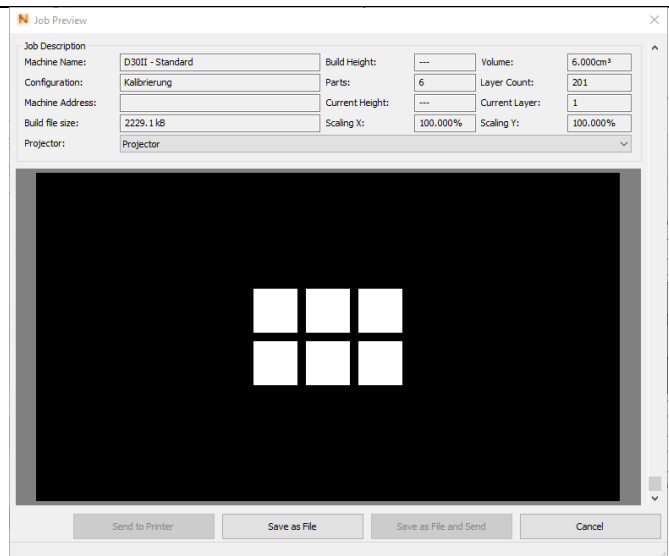


Figure 23

- (3) *Send to Printer:* A window will be opened in which a file name has to be entered. Confirm your entry by clicking the button "OK".
Note: The file ending must not vary from the pre-set ending (.rshapebuild), otherwise, the printer may not recognize the print job.
- (4) The printing job will be sent to the printer.
- (5) *Save as File and Send:* A window will be opened in which a storage location (on your computer) as well as a freely selectable name for your print job has to be entered. Confirm your entries by clicking the button "Save".
- (6) Afterwards, another window will be opened in which a file name has to be entered. Confirm your entry by clicking the button "OK".
Note: The file ending must not vary from the pre-set ending (.rshapebuild), otherwise, the printer may not recognize the print job.
- (7) The print job will be saved on your computer and be sent to your machine.
- (8) The printing data are now available under "Select Job" at your machine.

6.7.13 Transferring printing data via USB stick

Transferring the printing data via USB stick is possible:

- (1) Connect the USB stick, included in the scope of delivery, to your computer.
- (2) Save your created print job in the root directory of the USB stick (which means, do not save the job in a subfolder).
- (3) Eject the USB stick securely from your computer (right-hand click > eject)
- (4) Connect the USB stick to the USB slot of your machine (front).
- (5) The USB stick will transfer all .rshapebuild files to your printer.
- (6) The printing data are now available under "Select Job" at your machine

7 Operation

After having started the machine, the main menu will be displayed. By using the touch screen, you can switch between each menu levels. The menu levels will be described in the following chapters.

7.1 Overview operating elements

The operation will be performed via the touch display as well as the button “Automatic hood opening”.



Figure 24

7.2 Preparing the material reservoir and building platform

7.2.1 Material reservoir

This is a material reservoir with integrated heating function. The reservoir can be operated either with or without enabled heating function.

Whether a material can be operated with or without heating is set in the material database in Netfabb. The selection is done automatically, manual setting is not required.

In order to avoid unnecessary wear and tear, make sure that the reservoir's contacting areas (contacting, see detailed figure) are always dry and free from any material.

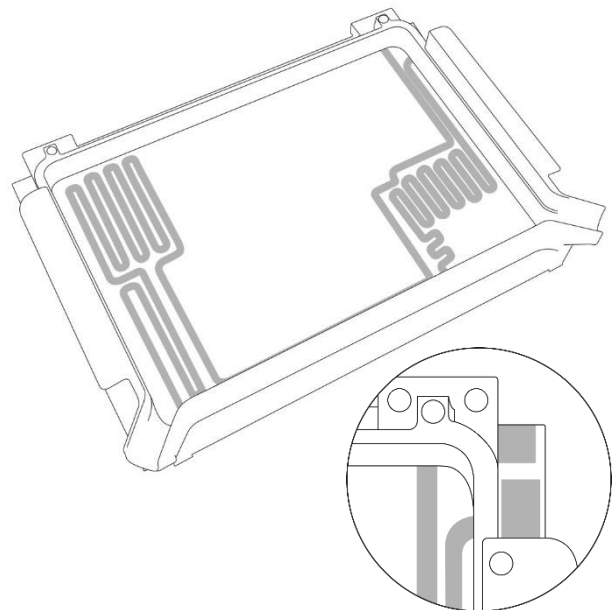


Figure 25



Warming up selected materials optimizes the printing times of the print jobs, however, it does not affect the printing quality.

We recommend to remove the reservoir from the machine and to switch off the printer when the printer will not be operated for several days.

7.2.2 Preparing the material reservoir

Ensure that the reservoir's bottom is clean (crystal clear) and that the reservoir is undamaged.

- (1) If necessary, clean the reservoir's bottom with isopropanol followed by glass cleaner.
- (2) Remove foreign objects and, if necessary, polymerized material inside the reservoir by using the automatic cleaning function (-chapter 7.10.1)
- (3) Check if sufficient material is inside the reservoir. If necessary, refill. (The maximum filling capacity of the reservoir is approx. 680 ml. To avoid overflow of the printing material during printing, the maximum filling level of approx. 11 ml must not be exceeded (see also the maximum filling level marking in the reservoir, if applicable).)
- (4) Mix the material carefully by using a silicone spatula. The silicone surface of the reservoir must not be damaged.

7.2.3 Preparing an empty material reservoir

- (1) Clean the reservoir's bottom with isopropanol followed by glass cleaner.
- (2) Clean the reservoir's inside with isopropanol and the silicone spatula. Afterwards, pat dry by using a finely woven cloth. Never wipe cloth! (see extra available handling recommendation)
Never use hard and/or sharp objects. These can damage the silicone surface of the reservoir.
- (3) Fill the material reservoir with the material selected in the slicing program. (The maximum filling capacity of the reservoir is approx. 680 ml. To avoid overflow of the printing material during printing, the maximum filling level of approx. 11 ml must not be exceeded (see also the maximum filling level marking in the reservoir, if applicable).)



Changing the material a lot of times is time consuming. Therefore, we recommend to use a separate reservoir for each material and keep a minimum reserve of three reservoirs on stock.



The material reservoir is a wearing part and must be replaced in case of a damaged silicone surface (e.g. blisters, scratches, clouding etc.).

7.2.4 Preparing a building platform

A cleaning of the building platform should be performed before and after each print job.

- (1) Remove any material residues.
- (2) Check whether the holes in the platform are free of any material residues.
- (3) Clean the platform with isopropanol.



Clean the building platform once a day by using acetone in order to remove any material residues and to improve the adherence of the print job on the platform.

7.3 Inserting material reservoir / building platform



When inserting the material reservoir into the machine, the following supporting messages will appear:

- General information about the material inside the reservoir, e.g. material name, expiry date (only in combination with RFID)
- Messages about possible error influences, e.g. material inside reservoir expired, reservoir empty, material not filtered for a long time (only in combination with RFID)
- Action buttons (“Material Mixed”, “Material Filtered”, “Reservoir Checked”) in order to confirm the status of the reservoir and the material (only in combination with RFID)

Insert the filled material reservoir into the machine.

- (1) Open the machine by pressing the button “Automatic hood opening” or by manually open the hood.
- (2) Insert the filled reservoir into the machine.

Machines with RFID technology:

- (1) Once the reservoir has been inserted into the machine, the material bottle, with which the reservoir has been filled, can be hold to the RFID label at the machine’s front. A recognition of the saved material properties will take place, a screen will appear on the machine’s screen. By pressing the button “Yes”, the material data can be saved on the reservoir.
- (2) The screen “Reservoir Check” will be displayed. Messages about possible error influences will be displayed (e.g. material expired). By pressing the button “Confirm”, the messages will be quit.
- (3) The screen “Reservoir inserted” will be displayed. By pressing the action buttons, the current status of the reservoir and the material can be confirmed.



Figure 26

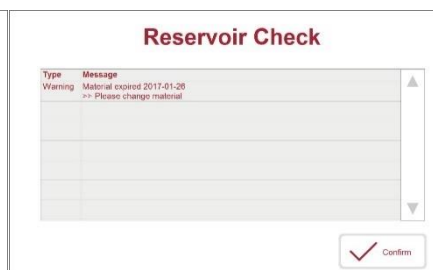


Figure 27



Figure 28

Insert the cleaned building platform into the machine.

- (1) Position the building platform onto the guide rail and fix it by using the rotary knob.

7.4 Starting a job



Caution

Danger of injury from UV radiation!

Printing takes place under the influence of UV radiation. UV radiation can cause permanent damage to eyes and skin if exposed for a long time without suitable protective equipment. Therefore, during printing, work at the machine may only be performed when wearing UV protection goggles.



- Printing process should be carried out when the protective hood is mainly closed.
- The material reservoir may only be used when it's filled with sufficient amount of material.
- It's recommended to wear the UV protection goggles during any operation at the machine.



Caution

Danger of injury to hands due to moving parts!

The machine consists of accessible moving parts which can cause light hand injuries from bruising and trapping. There is a risk of bruising and trapping due to moving of the building platform. Only personnel instructed in the machine may operate the machine.

- During printing process, no fingers or hands are allowed to be located in or inserted into the machine.



When starting a print job, the following supporting messages will appear:

- Messages about possible error influences by the machine, print job, material and reservoir (e.g. print job has been created with a different material as filled in the reservoir, print job has been created with a different machine type, material expired).

- (1) Main menu: Select „Select Job“.
- (2) Select a print job. (Tip: As from netfabb version 2018.3, a preview picture of the print job can be displayed under „Preview“.)
- (3) Start the print job with „Start“.
- (4) The function „Start Delayed“ enables a later starting time of the print job.



Figure 29

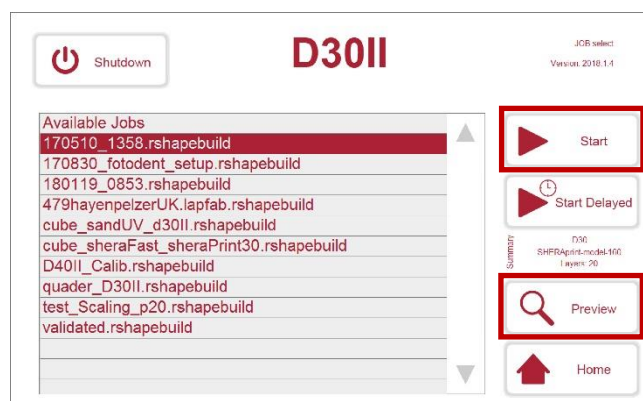


Figure 30

7.4.1 Delayed starting

A print job can be started automatically with a pre-set time delay:

Select the print job from the job list and press the button “Start Delayed”. Set the day and time when the print job should be started automatically and save your input. Insert a material reservoir which is filled with the sufficient amount of material and a cleaned building platform into the machine. Only when these preparations have been made, acknowledge the message about the material reservoir and the building platform! Close the protective hood. Keep the machine switched on.

If the pre-set time is reached, the machine will start the printing process of the selected print job automatically.

7.5 Pausing/ending a job

You can pause a current job at any time by pressing the button “Pause”. The machine will complete the last layer and pause the process. By pressing the button “Cancel”, the print job can be ended or cancelled prematurely.

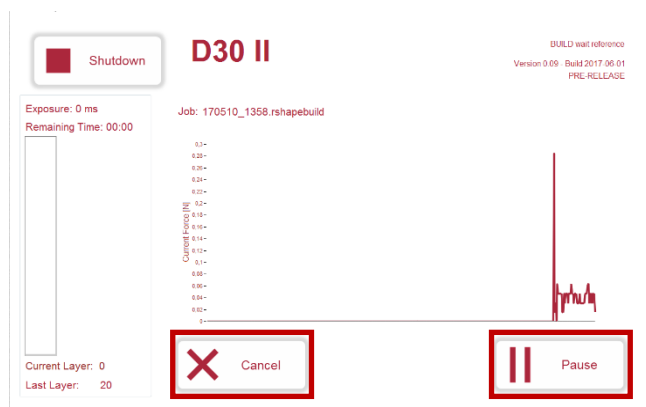


Figure 31

7.6 Removing the print job



Caution

Non-observance can lead to minor injuries. Low risk of hazard.

Precondition

- The build job is ended
- The reference run is ended, the building platform does not move anymore
- Briefly allow the platform to drain



It is essential to wear suitable protective clothing
(Hand protection)

- (1) Once the job is ended and the excess material has drained off, you can loosen the knurled screw above the build platform

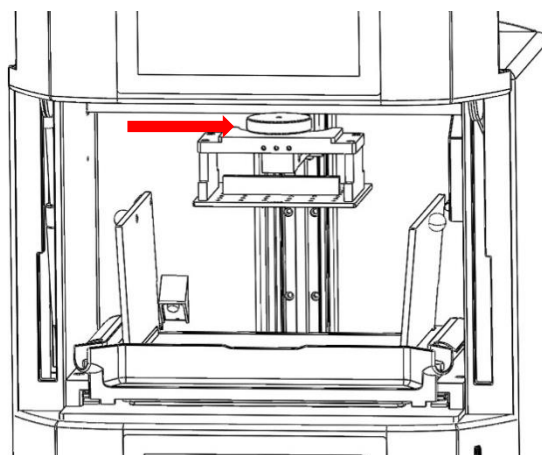


Figure 32

- (2) Carefully remove the build platform by slowly pulling the platform out towards you

Caution: When removing, use the specially designed removal tool to prevent dirtying the

machine and/or laboratory.

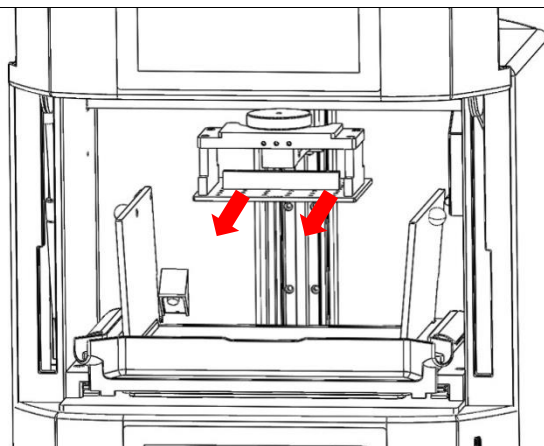


Figure 33

- (3) Prevent the component thus removed from being affected by UV and clean it directly after removal

Prolonged UV radiation can polymerize any excess material remaining on the component and thus impair the quality of the component.

7.7 Cleaning the component



Caution

Non-observance can lead to minor injuries. Low risk of hazard.

General instructions:



In any case, consult the manufacturer's material specifications when post-processing (cleaning, if necessary, drying and post-exposure). A bio-compatibility can be achieved only under consideration of the manufacturer's specifications.

For cleaning the component, the Rapid Shape Part Cleaner or high-proof isopropanol should be used. Under no circumstances, additives such as acetone or similar may be used. These will damage the component immediately and will leave white marks.

Preparation

- Prepare ultrasound bath
- Have paper toweling ready
- Removal of the build platform from the machine once the build job is completed

7.6 Removing the print job



It is essential to wear suitable protective clothing in accordance with the stipulations of the manufacturer (hand protection, protective goggles, respiratory protection, and protective coat).

- (1) Place the build platform on a paper towel and remove the build job from the build platform carefully with a spatula *[contained in starter kit]*
 - Hold the spatula carefully at a 45° angle at one of the corners of the build job
 - Carefully chip away at the corner of the component to get under it
 - Carefully position the spatula under the loosened corner and chip away in

-
- order to completely remove the build job from the build platform
- (2) Fill the cleaning fluid in a suitable container and place it in the ultrasound bath
 - (3) Place the component carefully in the container filled with isopropanol
 - (4) Start the ultrasound bath and let it run for 3 minutes (sample reference time)
 - (5) Remove the component from the ultrasound bath
 - (6) Remove the excess material as well as the excess isopropanol.
This is best accomplished by using gently metered compressed air.
 - (7) Carefully place your component once again in a new container filled with clean isopropanol
 - (8) Start the ultrasound bath and once again let it run for 3 minutes (sample reference time)
 - (9) Remove the component from the ultrasound bath
 - (10) Remove the excess material as well as the excess isopropanol.
This is best accomplished by using gently metered compressed air.
 - (11) Should the component still display signs of excess material, repeat step (3) and (4)
 - (12) The cleaning process is completed once all excess material has been removed.
-

7.8 Post-processing



Caution

Non-observance can lead to minor injuries. Low risk of hazard.

General instructions:



In any case, consult the manufacturer's material specifications when post-processing (cleaning, if necessary, drying and post-exposure).

For the different materials which can be used when operating the Rapid Shape printer,

There are different manufacturer stipulations for the different materials that can be used on Rapid Shape machines. Read the safety data sheet and the material data sheet of the manufacturer!

Post-processing with a flash device (example)

Preparation

- (1) Place your cleaned components in the exposure chamber of the flash device.
 - (2) Set the respective number of flashes and, if necessary, make additional settings on your device and start the process.
 - (3) Remove your components following successful completion of the process.
-

7.9 Menu "Calibration" (LED calibration)



Caution

Danger of injury from UV radiation!

Calibration takes place under the influence of UV radiation. UV radiation can cause permanent damage to eyes and skin if exposed for a long time without suitable protective equipment. Therefore, during calibration, work at the machine may only be performed when wearing UV protection goggles and by personnel instructed in the machine.



The calibration of the LED is essential for the print job's quality. Therefore, a regular calibration is very important. The process of how to calibrate the LED will be described in the following step by step.



In order to protect the eyes from permanent damages, during calibration process, UV protection goggles must be worn. Always wear the UV protection goggles included in the scope of delivery.



When calibrating the LED, an automated or a manual calibration can be selected (depending on the available calibration tool). The at the machine registered sensors can be used for calibration only. New sensors can be registered in menu „Setup“ -> „Service“ -> „Light Sensor“.

Preparations:

- (1) Start the machine.
- (2) Remove the material reservoir and the building platform.
- (3) Insert the calibration plate.
- (4) Put on the UV protection goggles.
- (5) Put the ACCS sensor (automatic calibration, chapter 7.9.1) or the calibration device (manual calibration, chapter 7.9.2) ready for use.

7.9.1 Automatic calibration

- (1) Insert the ACCS sensor's USB plug into the USB port at the machine's front.
- (2) Main menu: Press the button "Calibration".
- (3) If not yet done, perform the several steps displayed on the screen and conform by pressing the button "Yes".
- (4) Follow the several steps displayed on the screen.



Figure 34



Figure 35



Figure 36

7.9.2 Manual calibration

- (1) Main menu: Press the button "Calibration".
- (2) If not yet done, perform the several steps displayed on the screen and conform by pressing the button "Yes".
- (3) Switch on the calibration device.
- (4) Position the light intensity sensor in the middle of the displayed calibration point.
- (5) Change the calibration value of the machine by pressing the button +/- until the calibration device displays the desired value. (see chapter 3)
- (6) Repeat point (5) for "high value" by pressing the button "high power active".
- (7) Ending calibration: Save the values by pressing the button "Apply". By pressing the button "Reset", the saved values will be reloaded. Leave the calibration menu by pressing the button "Home".

About the calibration device

- [1] Sensing input, connection 8-pin DIN45326.
- [2] Battery icon: Indicates the charge state of the battery
- [3] Function display
- [4] Secondary image line
- [5] **Key DATA/ENTER**
Displays in standard mode the maximum (MAX), minimum (MIN) and average (AVG) value of the recorded measurements. Confirms the current selection in the menu
- [6] **Key CLR/ESC**
Resets the maximum, minimum and average value of the recorded measurements. Resets the value stipulated via the arrow keys in the menu
- [7] **Key HOLD**
Retains the measurement in normal mode.
Increases the current value in the menu
- [8] **Key UNIT/MENU**
Enables the unit of measure to be stipulated.
Pressing this key and at the same time the key DATA takes the user to the menu
- [9] **Key STD-BY**
Switches the unit of measure of the cross-section surface in the menu between m^2 and $inch^2$
- [10] **Key REL**
Activates in standard mode the relative measuring mode (display of the difference between the current value and the value saved via the key press). Reduces the current value in the menu
- [11] **Key ON-OFF/AUTO-OFF**
Switches the device on or off. Pressing this key and at the same time the key HOLD deactivates the automatic off function
- [12] Symbols MAX (maximum value), MIN (minimum value) and AVG (average)
- [13] Main line
- [14] Symbol and commentary line

(DeltaOhm, 2005)

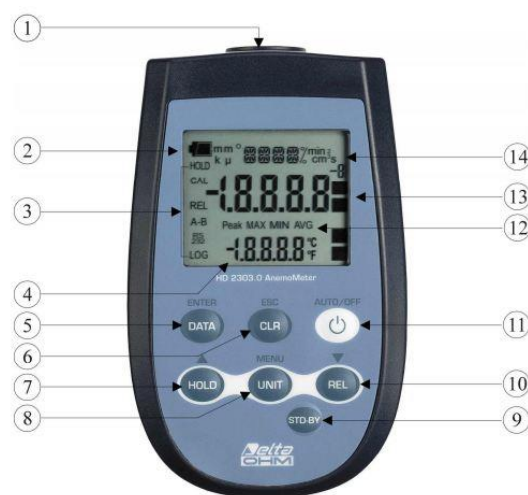


Figure 37 (DeltaOhm, 2005)

7.10 Menu "More Functions"

7.10.1 Cleaning the reservoir off particles



Caution

Danger of injury from UV radiation!

Cleaning process takes place under the influence of UV radiation. UV radiation can cause permanent damage to eyes and skin if exposed for a long time without suitable protective equipment. Therefore, during cleaning, work at the machine may only be performed when wearing UV protection goggles.



- Cleaning process should be carried out when the protective hood is mainly closed.
- During cleaning process, the UV protection goggles, supplied in the scope of delivery, must be worn.

During printing of a component, pieces of polymerized material can become loose and be deposited into the reservoir. In order to prevent damages due to small polymerized material pieces, they need to be removed. Small pieces of polymerized material cannot be removed from the reservoir by hand without damaging the reservoir. For this reason, there are two possibilities to clean the reservoir:

- (A) Empty the reservoir, filter the material and clean the reservoir (chapter 8.1)
- (B) Clean the reservoir automatically by automatic cleaning function



During automatic cleaning function, the lowest material layer will be cured in the reservoir. This way, the particles located in the building area will be bound and can be removed by pulling off the cured layer out of the reservoir.

- (1) Close the machine.
- (2) Main menu: Press the button "*More Functions*".
- (3) Press the button "*Clean Reservoir*". The cleaning process will be performed automatically, the remaining cleaning time will be displayed on the screen.
- (4) After the cleaning time has been expired, remove the reservoir.
- (5) By using an edge of a playing card (included in the scope of delivery), carefully loosen the cured layer from the reservoir's bottom.



Figure 38

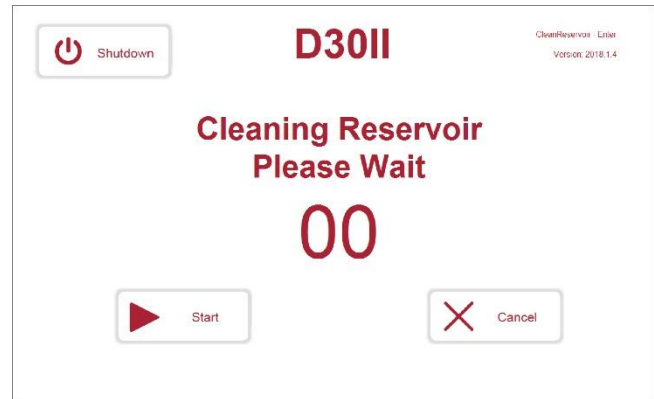


Figure 39

7.11 Menu "Manual"



Caution

Danger of injury from UV radiation!

In manual mode, example images can be projected under the influence of UV radiation. UV radiation can cause permanent damage to eyes and skin if exposed for a long time without suitable protective equipment. Manual mode must only be operated when wearing UV protection goggles.



- During the machine's operation in manual mode, the UV protection goggles included in the scope of delivery must be worn.

In manual mode, several single functions (e.g. moving the building platform upwards and downwards) for testing or setting purposes are possible.

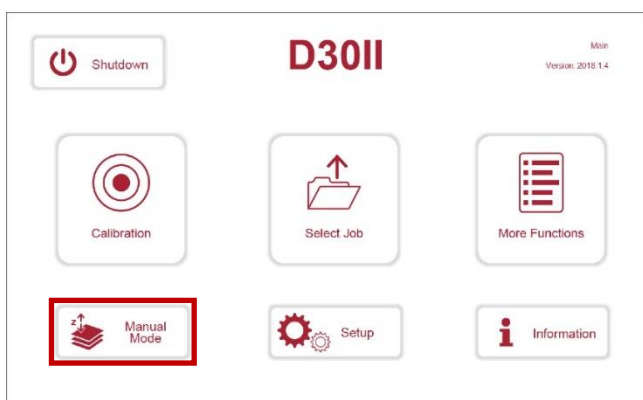


Figure 40

7.11.1 Verifying/setting parallelism



Caution

Can lead to minor or moderately serious injuries. Low risk of hazard.



In order to prevent components from becoming loose off the building platform, it's essential that the building platform is set parallel to the projection area. How to set the building platform parallel will be described step by step in the following.

Preparation

- Machine started up
- Build platform fitted
- Calibration plate inserted
- Build platform in reference position (top)



Required tools:

- Allen key 2.0mm
- Allen key 3.0mm
- Playing cards from starter kit (alternative: small sheets of paper/business cards)

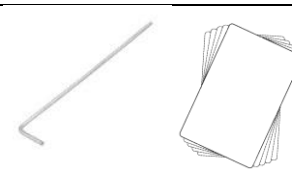


Figure 41

Preparing the machine

- (1) Remove, if necessary *[if still in the machine]*, the material reservoir and insert in the calibration plate
- (2) Navigate to menu "Manual"
Main menu → Manual

Start the "Find Zero" process

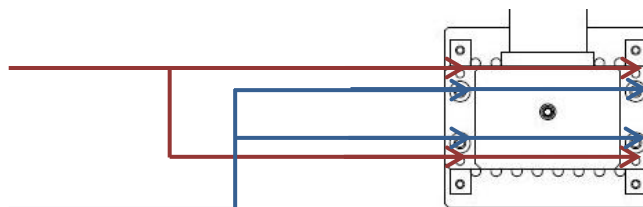
- (1) Press the button "Find Zero"
- (2) The platform lowers until to zero point
Wait until the platform has reached its zero point
- (3) Take a paper card and try to slide it under each corner of the platform. If the card slides under none of the corners, the platform is sufficiently well adjusted.

Setting parallelism

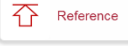
- (1) If the card can be easily slid under a corner, parallelism must be set.
To do this, loosen the retention screws (blue arrow in the next picture)
To adjust the parallelism, turn the adjusting threaded bolts at the corner you wish to change in the desired direction.
- (2) To re-verify parallelism, repeat the procedure.

Threaded bolts for adjustment purposes

Retention screws



Running the platform in the starting position

- (1) Select in the menu "Reference" 
- (2) The platform rises up to the reference point in the basic setting position
It is important to wait until the platform has reached its reference point

Caution: Once the end switch has been reached the platform travels slightly back down again. This is intentional in order to be able to precisely determine the starting position.

7.11.2 Menu "Show Image"

The menu point "Show Image" enables a projection of saved pictures for test and analysis purposes. If necessary, the service team can guide you through this menu.

Note: Always remove the reservoir and the building platform before projecting a picture! Otherwise, the material inside the reservoir and on the building platform will cure.

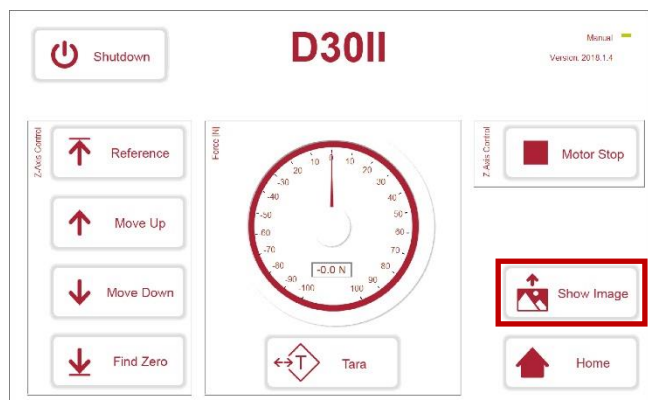


Figure 42

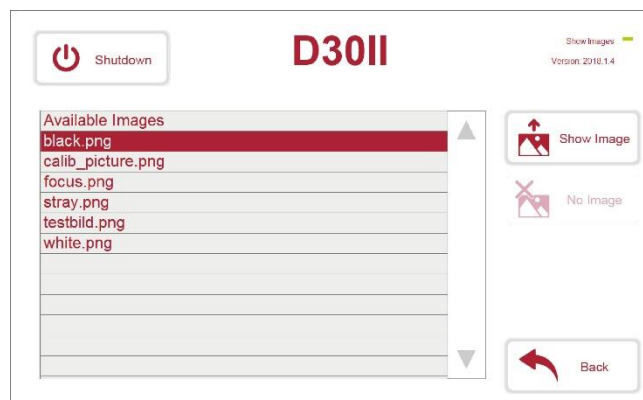


Figure 43

7.12 Menu "Setup"

In menu "Setup", the following information can be looked up and the following settings can be performed:

- Network settings (menu "Network Settings")
- File management ("File Management")
- Serialnumber, licence validity ("License Settings")
- Access to service menu ("Service" -chapter 7.13)

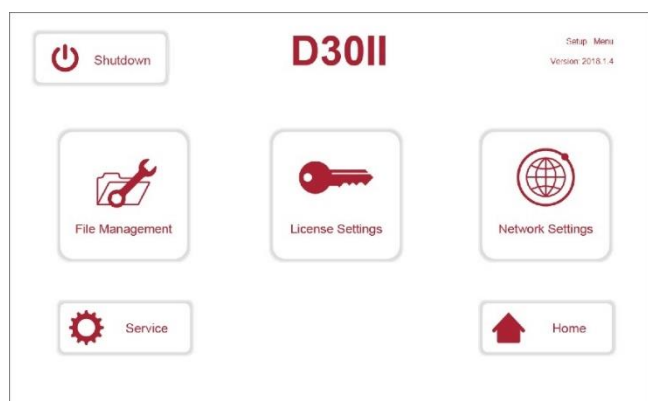


Figure 44

A standard computer keyboard or computer mouse can be connected to the printer for adjustment or service purposes. To do this, plug in the USB connector of the keyboard/mouse into the USB port of the printer. The device will be recognized automatically, the functions can be used immediately.

7.13 Menu "Service"

For entering the menu "Service", a code must be entered ("Switch Level"). You will receive the code for customer admin at installation of the machine. After having logged into service menu, several sub menus can be opened.

In order to leave the service menu, press the button "Logout". (An automated return to main menu will occur after 10 minutes).



Several settings can be performed password protected by the Rapid Shape Service only.



Figure 45



Figure 46

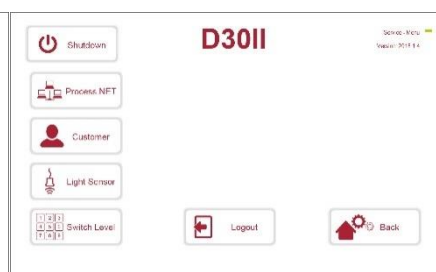


Figure 47

7.13.1 Menu "Process.NET"

"Setup" > "Switch Level" > "Process.NET"

In this sub menu, the additional function *Process.NET* can be activated/deactivated.

Process.NET enables a status control overview of all connected devices, a comparison of all machine and process parameters, data export and many more via an internet enabled device (PC, tablet, smartphone).



Figure 48

7.13.2 Menu "Customer" - Hide/Show hints

"Setup" > "Switch Level" > "Customer"

In this sub menu, the additional hints ("Reservoir inserted") can be set active (green) or can be hidden (red).

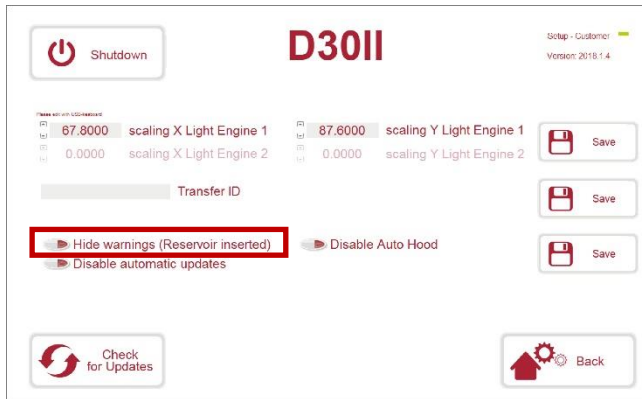


Figure 49

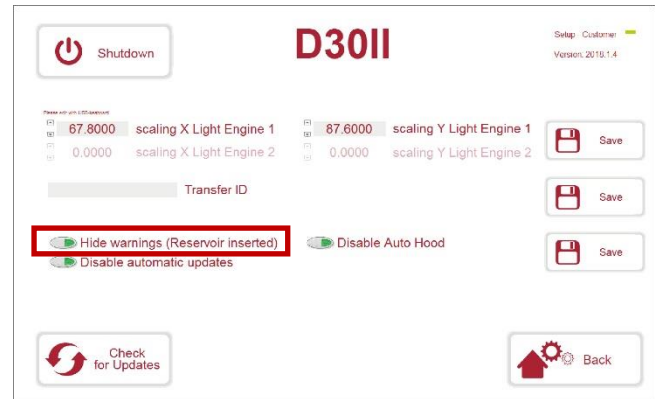


Figure 50

7.13.3 Menu "Customer" - Automatic hood closing

"Setup" > "Switch Level" > "Customer"

The function of the automatic hood closing (see chapter 6.5.1) can be activated or deactivated.

By pressing the button *"Disable Auto Hood"*, the function of the automatic hood closing will be activated (green) or deactivated (red). In case of deactivated function, the protective hood must be closed manually.

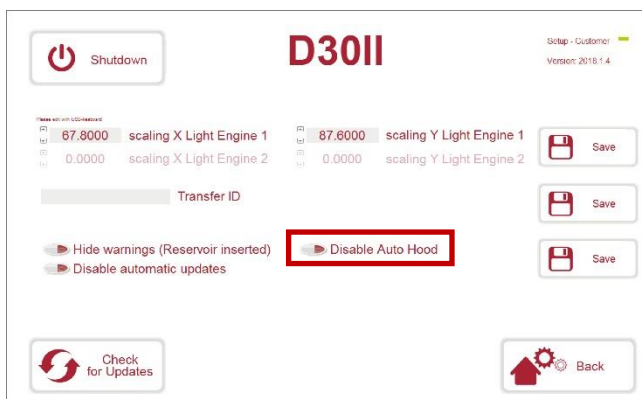


Figure 51

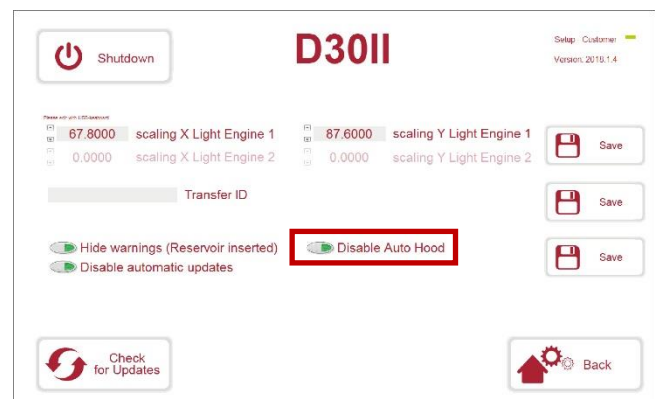


Figure 52

7.13.4 Menu "Customer" - Autoupdate

"Setup" > "Switch Level" > "Customer"

When starting the machine, or when entering *"Setup" -> "Service" -> "Customer" -> "Check for Updates"*, the machine will check via the Rapid Shape Homepage whether if a new update is available for the machine. (Precondition: active internet connection)

If a new update is available, a message with all detail information about the available update will appear. By confirming, the update will install itself automatically and will afterwards perform a restart of the machine.

By pressing the button *"Disable automatic updates"*, the function will be activated (green) or deactivated (red).

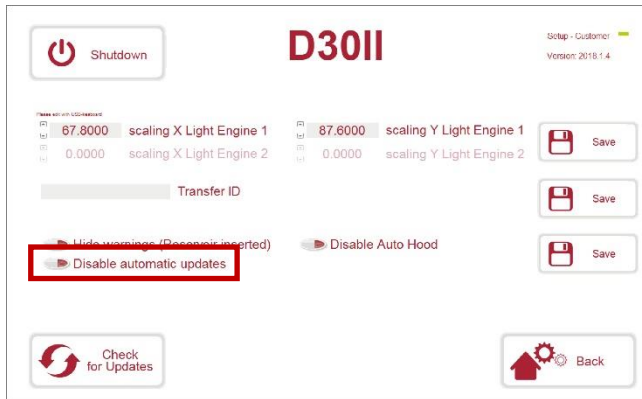


Figure 53

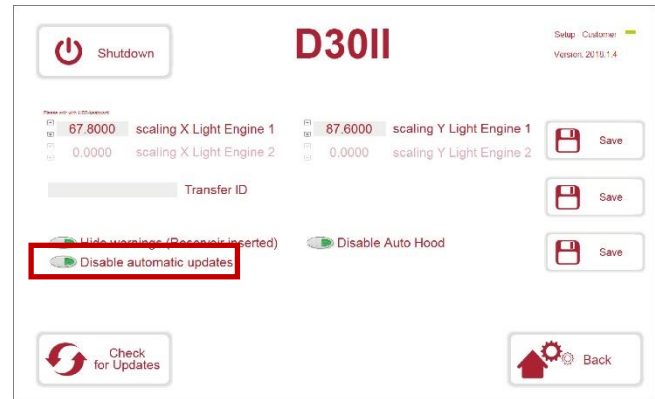


Figure 54

7.14 Menu "Light Sensor"

"Setup" > "Switch Level" > "Light Sensor"

In this sub menu, the following information can be looked up and the following settings can be performed

- Serialnumber, date of the last calibration, sensor type etc.
- Adding new sensors

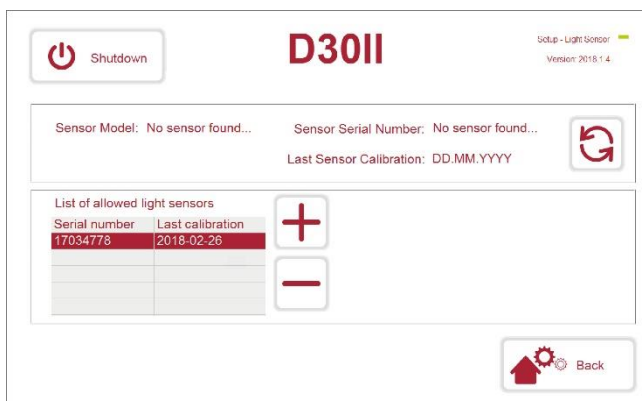


Figure 55

8 Cleaning and maintenance



Warning

Non-observance can lead to serious injury or even death. Medium risk of hazard.



Warning

Before carrying out maintenance work which requires an active power supply, switch off the machine at the main switch. Secure the main switch against (unauthorized) restart. Maintenance work may only be carried out by trained personnel and equipped with adequate protective equipment (e.g. protective gloves).

8.1 Cleaning

A brief cleaning of the machine must be performed after each printing. This must include:

8.1.1 Cleaning the building platform



Remove all material residues

Check if the holes of the building platform are free from any material residues

Clean the building platform with Rapid Shape Machine Cleaner or isopropanol

Moreover, the machine should be constantly checked for cleanliness of the following components:

- Protective glass
- Material reservoir bottom
- Material reservoir
Remove foreign bodies and any polymerized material
- Housing in general

8.1.2 Cleaning the material reservoir

The material reservoir is one of the basic elements of the machine. Therefore, the reservoir must be cleaned whenever possible.



Clean the inside of the material reservoir by using isopropanol. Only use a finely woven cloth to do this.

Clean the bottom of the material reservoir by using isopropanol followed by glass cleaner.

Attention: Isopropanol leaves streaks. It is absolutely essentially to clean afterwards with **glass cleaner**.

8.2 Regular maintenance by the customer

Maintenance and care of the machine is essential for a properly functioning. Therefore, it is absolutely essential to follow the instructions on maintenance and care precisely.

8.2.1 Care before every print job



- (A) Remove any cured material from the **material reservoir** by using a silicon spatula or filter the material by using a fine filter or by using the automatic cleaning function.
Attention: SENSITIVE - Never use sharp / metallic objects.



- (B) Remove any cured material from the **building platform** by using a spatula. The building platform must have a complete smooth surface before starting printing.

8.2.2 Daily maintenance



- (A) Check the **protective glass** for absolute cleanliness (no dust, resin or streaks)
 ○ If necessary, clean the glass by using isopropanol (ISO), followed by glass cleaner
- (B) Clean the bottom of the **material reservoir** by using isopropanol followed by glass cleaner.

8.2.3 Weekly maintenance



- (A) Perform a **parallelism check** of the building platform.
- (B) Check the **light intensity** in calibration menu.

8.3 Maintenance by the manufacturer



More extensive maintenance is only to be carried out by Rapid Shape personnel. For information on maintenance agreements, maintenance intervals as well as general information concerning maintenance, please contact Rapid Shape or its distributors directly. You can reach us here:

Company name:	Rapid Shape GmbH		
Address:	Römerstraße 21		
Town:	71296 Heimsheim		
Phone:	+49 (0) 7033 309878-0	Fax:	+49 (0) 7033 309878-40
Internet:	http://www.rapidshape.de	Mail:	service@rapidshape.de

9 Service

Our service team would gladly offer any help you need regarding all queries or problems.

If you have

- questions on rectifying faults on Rapid Shape machines
- general questions concerning Rapid Shape machines
- general queries concerning materials sold by Rapid Shape
- general questions concerning netfabb
- specific questions on material specifications in netfabb
- any other queries concerning Rapid Shape machines

please call our Service Team:

Company name:	Rapid Shape GmbH		
Address:	Römerstraße 21		
Town:	71296 Heimsheim		
Phone:	+49 (0) 7033 309878-0	Fax:	+49 (0) 7033 309878-40
Internet:	http://www.rapidshape.de	Mail:	service@rapidshape.de

10 Final decommissioning

10.1 Shutting down the machine

-
- (1) Select „Shutdown“ in main menu.
 - (2) The shutdown dialog appears. Confirm in order to shutdown the machine.
-

Only switch off the main switch after the machine has been completely shut down!

10.2 Storage

Store the machine on a dry and level surface which is protected against moisture.

11 Disposal



- It is recommended to wear suitable protective cloths. (protective gloves, if necessary, other protective cloths)
- Disassembly work may only be performed by qualified personnel.



Incorrect disposal of electronic waste, electric components, lubricants and other additives can be hazardous to the environment. Therefore, dispose machine components as intended by your waste disposal company or by authorized specialist companies.

11.1.1 Disassembly

Before starting disassembly work, ensure that no material reservoir and no building platform is inserted in the machine.

- (1) Switch off the machine.
- (2) Disconnect the power supply off the machine.
- (3) Remove any material residues and dispose as intended (e.g. printing materials).
- (4) Afterwards, properly clean the components and disassemble in compliance with local environmental guidelines. [see data of material compositions]

11.2 Dispose

The machine may be returned to Rapid Shape upon prior notification for final disposal. Any costs incurred in this connection shall be borne by the customer / operator himself.

Materials used:

Hoods: Aluminum, steel, plastic (ABS), glass

Housing: Aluminum, steel, plastic (POM), glass

Electronics: Circuit boards/PCBs, electronic components, aluminum (housing), steel (housing)

Other materials <10%: Various

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Copyright ©	Address:	Rapid Shape GmbH Römerstraße 21 71296 Heimsheim
	Telephone:	+49 (0) 7033 309878 0
	Fax:	+49 (0) 7033 309878 40
	Email:	info@rapidshape.de
	Internet:	www.rapidshape.de