EN

choc mate 2

by chocolate3

User manual

Welcome

Thank you for choosing a choc mate 2 by chocolate³.

We wish you lots of fun and creativity while using it!

Satisfied?

Share your experiences with colleagues, friends and customers. Also, become part of our growing community and share your results on social media

#chocmated

Problems?

Visit our help pages at

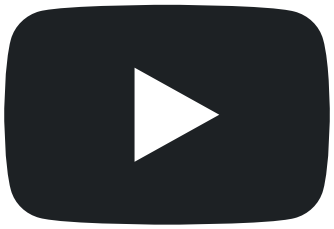
https://choc-mate.de/****

or contact the support

support@chocolate3.de

As a supplement to these instructions, please also take a look at our videos at

https://www.choc-mate.de/quick-start/



choc mate 2

Inhaltsverzeichnis

1. Basic information

1.1. Use of these operating instructions

Caution: Before using the choc mate 2 for the first time, these operating instructions must be read carefully and observed. Non-observance of individual points listed in the operating instructions can cause personal injury and / or damage to property!

No part of this operating manual may be reproduced, edited or otherwise modified in any form without the prior written consent of chocolate³. chocolate³ reserves the right to change the specifications of the hardware and software described in these operating instructions at any time and without prior notice.

Please ensure that you have the latest version of the operating instructions. Also check after a software update whether a new version of these instructions is available.

The latest version of the operating instructions can be found at:

https://choc-mate.de/***

There you will also find the operating instructions in your national language if these are not enclosed, although the German instructions should always be regarded as the original.

Please keep the operating manual for future reference.

1.2. General description of the product

Chocolate 3D printer for commercial use.

The choc mate 2 is a 3D printer for chocolate or couverture with a print area of 340x232x160mm.

It has a heatable print head with two temperature control circuits. The printer also has a heated preheater for preparing another cartridge. In the Z direction, the minimum layer height is 0.1 mm. This means that very filigree structures and very smooth surfaces can also be printed. In the X-Y direction, a resolution of approx. 0.1 mm is achieved. The actual accuracy when printing chocolate depends largely on the chocolate used, the temperature and the ambient conditions.

An integrated print server with a 4.3“ touch display makes it possible to operate the printer independently. Due to the network interfaces, the printer can also be operated with the help of a browser.

We clearly point out that the system must not be operated unattended.

Any additional devices must be matched to the main unit (if you have any queries, please contact the manufacturer).

1.3. Disclaimer

This user manual must be read carefully as it contains all the necessary information for the user to operate the choc mate 2 safely and correctly. The operator must ensure that each user of the 3D printer has access to a copy of this manual and has read and understood it.

The requirements or procedures for the assembly, handling, storage, use or disposal of the device are beyond our control and knowledge. Therefore, for this reason and others, we expressly disclaim any liability for loss or injury, damage or expense arising out of or in connection with the installation, handling, storage, use or disposal of this product. The information contained in this document has been obtained from what we believe to be reliable sources. However, no warranty, express or implied, is made as to its accuracy.

1.4. Hazard warnings

The following risks exist when using the chocolate printer. You will find the symbols at the appropriate place in the manual:

General warnings

Danger to life due to electric shock

Danger of burns from hot machine parts such as print head and preheater

Danger of crushing due to moving parts such as print bed, print head,

Z-axis and extruder

Danger from magnetic field of the magnetic exchange plate, print bed Z-switch and distance sensor.

- Keep devices and objects away that can be damaged by strong magnetic fields.
- We ask people with pacemakers not to come too close to the device.

1.5. Declaration of conformity from **.**.2021

2. Safety instructions

2.1. Intended use of the machine

On the following pages you will find important information on the proper use and safety of the choc mate 2.

Read these instructions carefully before using the appliance.

Observing this manual and taking the information it contains into account and applying it is part of the intended use.

Improper operation can lead to dangerous situations. Use of the 3D printer under conditions other than those described in this manual and for purposes other than those specified here is considered improper use and leads to the exclusion of any liability and warranty claims.

The device may only be operated under the constant supervision of appropriately trained persons.

The choc mate 2 is designed for commercial use to produce different designs from real, cocoa butter based chocolate using the FFF process.

The printer uses ordinary .gcode files. Print files can be created using choc OS, which has been specially developed for chocolate printing. Alternatively, .gcode files can also be created from CAD data using commercially available software (so-called slicers). The settings of the software used are up to the user. Under certain circumstances, not all functions are supported. We strongly recommend choc OS, which has been specially developed for the chocolate printer. It is available after registration at https://choc-mate.de/app.

After uploading the files to the printer, the model is made either from chocolate sticks (available from chocolate³) or almost any other commercially available chocolate or couverture. During the process, the chocolate used is melted and tempered or pre-crystallised, extruded in small quantities depending on the file used and applied in layers. After application, the chocolate cools down and thus crystallises again.

The use of different chocolates is possible without any problems, please contact your supplier for processing instructions. Settings for an optimal printing result are to be defined by the customer.

Operation of the choc mate 2 is prohibited under the following circumstances:

- The 3D printer is not being used for its intended purpose.
- The choc mate 2 or individual components are damaged, the electrical equipment or parts of the insulation are faulty or incorrectly installed
- The choc mate 2 is not working properly
- Mechanical components or the control unit have been improperly modified or rebuilt.
- Operating parameters have been changed without permission or improperly
- Operation with non-specified materials
- Failure to carry out the prescribed maintenance work
- Operation in an explosive atmosphere

2.2. Suitability for food

The chocolate printer has been developed according to the current state of knowledge and taking into account the currently applicable regulations for use with food (in particular chocolate).

We confirm, based on the information provided by our suppliers, that the following components comply with the guidelines of Regulation (EC) No. 10/2011 and are therefore suitable for contact with food:

- Piston (POM)
- Sealing rings (Silicone)
- Cartridges (PP)
- Nozzles (PP and stainless steel)
- Foils (PP)
- Wire (stainless steel)

2.3. General information on safety

The choc mate 2 generates heat during operation and has moving parts that can cause injury. Never reach into the 3D printer while it is in operation. The heating elements in particular can reach high temperatures. Wait until they have cooled down sufficiently before touching them. Only operate the choc mate 2 using the touch display on the front or the on/off switch on the top of the machine. Do not make any changes or adjustments to the choc mate 2 that are not approved by the manufacturer. Do not store any objects in or on the choc mate 2. The choc mate 2 is not intended for use by persons (including children) with reduced physical and/or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should never be allowed to use the choc mate 2 unsupervised. When opening the printer for maintenance or modifications, make sure that the mains plug is disconnected from the socket.

2.4. Electrical safety

The choc mate 2 is operated with 24V (DC) and 230V (AC). Touching live components can be life-threatening and cause the most serious injuries.

The power supply complies with all CE marking regulations and is protected against short circuit, overload, overvoltage and overheating. For further information regarding electrical safety, please refer to Mean-Well's EU Declaration of Conformity for the GST60A24-P1J desktop power supply.

Only use the choc mate 2 with the mains cable and mains adapter supplied by the manufacturer.

Make sure that the mains cable (power supply cable) is not damaged. Devices with a damaged mains cable must be disconnected from the mains (pull out the mains plug) and repaired by a specialist electrician before being used again.

Only connect the 3D printer according to the specifications in the data sheet.

Work on the electrical equipment of the choc mate 2 and the power supply may only be carried out by qualified electricians.

Always disconnect the 3D printer from the power supply by pulling the power cable before carrying out cleaning, maintenance or repair work.

Check the condition of cables and insulation regularly and replace damaged parts immediately.

Installation and operation of the 3D printer in damp rooms or outdoors is not permitted.

2.5. Mechanical safety

The choc mate 2 contains numerous moving parts. However, the stepper motors of the individual axes do not have enough power to cause serious injuries. In addition, the moving drive parts are covered with a protective cover. Nevertheless, you should only reach into the unit when it is switched off! Tie up long hair when operating and wear only tight-fitting clothing. Loose clothing such as scarves, jewellery and chains pose a risk of injury.

Attention: Observe the overrun of the printer. Wait until the printer has finished its movements before reaching into the device!

2.6. Risk of burns

The print head including nozzle and the preheater are heated. Temperatures up to 45°C can be set. Although these temperatures are not dangerous, the heating elements themselves can become significantly hotter. Maloperation and malfunctions can also cause higher temperatures.

The heating elements always remain active until they are switched off! This is the only way to ensure that the chocolate can be processed permanently.

Switch off the heating and wait until all elements have cooled down enough to allow safe touching.

Caution:

The heating elements still have an increased temperature! Wear protective clothing!

2.7. Possible misuse

The choc mate 2 has been developed and built according to applicable standards and carefully tested for functionality before delivery, so that it is safe and ready for operation upon delivery. Nevertheless, dangerous situations or damage to property may occur as a result of the production process itself, incorrect operation or technical defects.

The risk of dangerous situations is increased by:

- Use of the choc mate 2 other than as intended.
- Improper operation of the 3D printer.
- Operating the 3D printer in an unsafe or unsuitable condition.
- Insufficient attention, negligent handling and excessive soiling.

Therefore:

- Only use the 3D printer as intended.
- The choc mate 2 must always be in perfect and safe condition.
- Check the 3D printer for wear, damage and cleanliness before each use and at regular intervals.
- Make sure that no one can be injured by the 3D printer.
- Immediately rectify any fault or visible damage.
- If immediate rectification of the fault is not possible, take the 3D printer out of service and do not use it again until all problems have been fully rectified.
- Observe local accident prevention regulations.
- Ensure that every user of the 3D printer has received instruction for this device and has access to this user manual at all times.
- Use materials other than chocolate at your own risk.

2.8. Cleaning

Unplug the appliance from the mains before cleaning. Use a dry cloth for cleaning and clean only the surface.

The chemicals required for maintenance and care must be handled properly and in compliance with the applicable regulations and instructions for use of the chemicals. The manufacturer‘s instructions must be followed, appropriate protective clothing must be worn and the dosage instructions must be strictly adhered to. Improper handling of chemicals can cause damage to property and personal injury for which the operator alone is liable.

2.9. Mains voltage

Operate the unit only at the mains voltage specified for the unit (can be seen on the back of the unit or on the external power supply unit). The unit may only be connected to the mains and switched on after all connections have been checked.

2.10. Risk of injury

Some hazards are function-related and therefore cannot be avoided by design. In order to avoid injuries, it is necessary that the user is aware of these hazards and is correspondingly attentive during operation. The operator is responsible for observing appropriate protective measures.

The preceding safety instructions are intended to protect the operator choc mate 2. It is the operator‘s duty to ensure that everyone who works with or on the 3D printer is familiar with this chapter and observes the information contained therein.

2.11. Liabilty

All information and notes in these operating instructions have been compiled taking into account the applicable regulations, the current state of development and our many years of knowledge and experience.

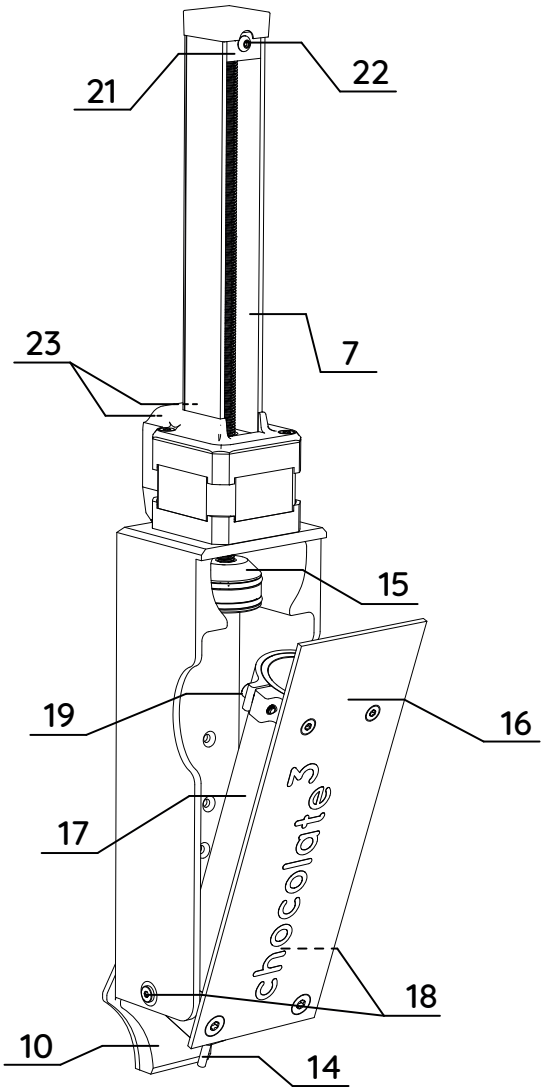
The translations of the operating instructions have also been prepared to the best of our knowledge. However, we cannot accept any liability for translation errors. The enclosed German version of these operating instructions is authoritative.

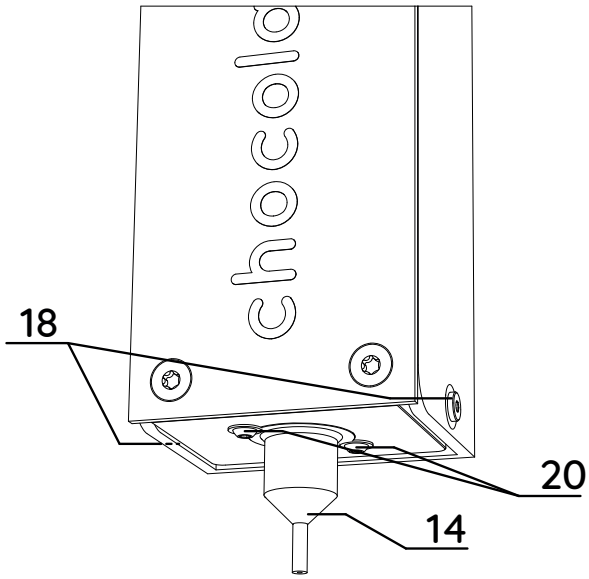
The actual scope of delivery may differ from the explanations and drawings described here in the case of special versions, the use of additional order options or due to the latest technical changes. If you have any questions, please contact the manufacturer.

These operating instructions must be read carefully before starting any work on and with the unit, especially before commissioning! The manufacturer accepts no liability for damage or malfunctions resulting from non-compliance with the operating instructions.

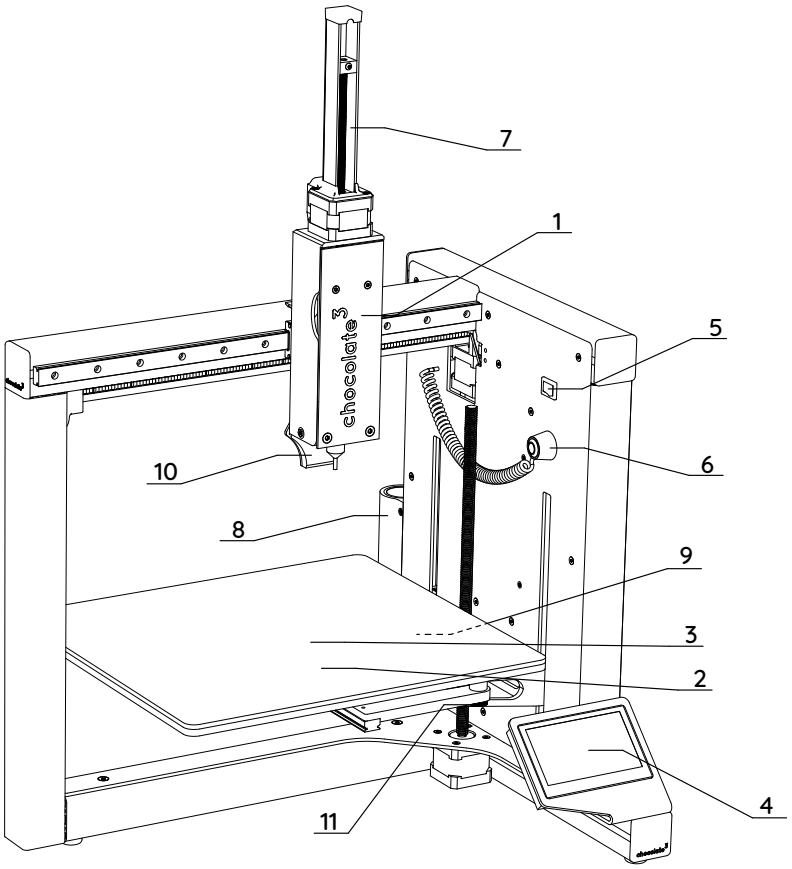
3. Components overview

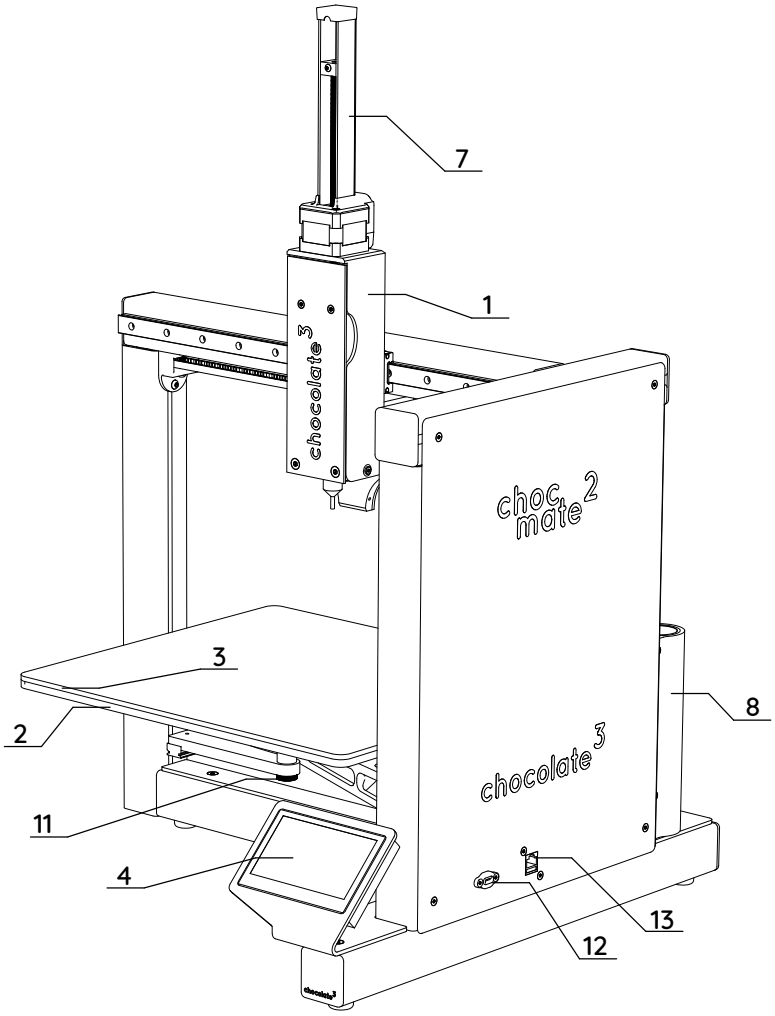
3.1. Overview





1. Printhead
2. Print bed
3. Magnetic buildplate
4. Touch display
5. Power switch
6. Z-button
7. Printhead guide
8. Preheater
9. Power connector
10. Optical distance sensor
11. Nut for levelling the print bed
12. USB-C port
13. Ethernet connection (RJ45)
14. Nozzle element
15. Piston
16. Print head door
17. Tube heater
18. Fixing screws door
19. Fixing screw pipe heater
20. Fixing screws nozzle element
21. Sliding element
22. Clamping screw sliding element
23. Clamping screws printhead guide


7
1
5
6
10
8
9
3
2
4
11


7
1
3
2
8
11
4
13
12

3.2. Scope of delivery

1	Chocolate 3D Printer
1	Power supply unit
1	Power cable (country specific)
1	Magnetic buildplate
1	50 foil blanks
1	Piston
4	Sealing rings
2	Wire
3	Sealing caps (colour varies)
1	Cartridge lid
1	Tool set (hexagon socket spanner 0.9 mm, 2.0 mm, 2.5mm)
5	Cartridges
1	Piston (manual)
2	Spare screws nozzle element
1	Pack of 4 white chocolate sticks
1	Pack of 4 milk chocolate sticks
1	Pack of 4 dark chocolate sticks
1	Guide print head
1	Optical distance sensor
2	Dust protection cap RJ45 socket
1	Nozzle element for 0,84 mm
3	Nozzle element for 1.19 mm
1	Nozzle element for 1.60 mm
3	Nozzle 0,84 mm
1	Nozzle 1.19 mm
3	Nozzle 1.60 mm

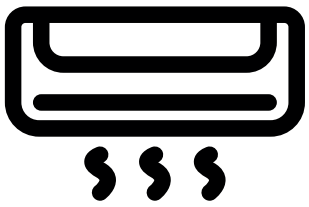
4. First commissioning

4.1. Location

Place the choc mate 2 in a cool or ideally air-conditioned room with a year-round average temperature between +10 and +35°C and a relative humidity of no more than 60%.

The 3D printer is not approved for operation in an explosive atmosphere or in a damp room.

During printing, the ambient temperature should be between +18°C and +22°C. For best results, we recommend a room air-conditioned as precisely as possible to 19°C.



18 - 22 °C

The power socket must be easily accessible and in the immediate vicinity of the unit. In case of emergency, it must be possible to disconnect the mains plug.

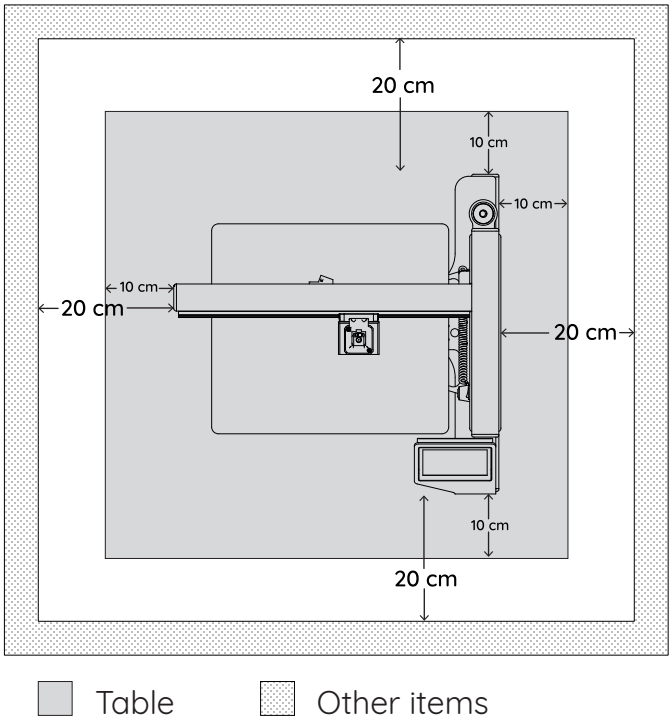
Select the operating mode so that children cannot reach the product.

Do not place the appliance in the immediate vicinity of open fire sources, such as cookers, deep fryers or burning candles.

Make sure that the power cord is not crushed or damaged by sharp edges when placing the product.

Place the printer on a level, stable base such as a table.

All three feet must stand firmly on the table and be at least 10 cm from the edge. In all directions there should be a distance of at least 20 cm to other objects. For ergonomic operation, the base should be at least 75 cm high and there should be at least 125 cm of space in front of the printer.



Vibrations during the printing process can be transmitted to the base if it is not sufficiently stable and thus impair the printing result.

Make sure that the print bed can move freely to the front and back and the print head to the left and right.

Do not place the printer in the immediate vicinity of heat sources. Do not cover the printer during operation. Every electronic device generates waste heat, including our 3D printers. The heating of our devices is within the permissible range. Nevertheless, it can happen that sensitive surfaces discolour over time due to the constant heat development. The-

refore, if possible, place the device on a firm, level and insensitive surface. There must be no flammable objects in the vicinity! Ensure that there is sufficient air circulation.

The unit must not be exposed to extreme temperatures, strong vibrations, high humidity, such as rain or steam, dust or strong mechanical stresses.

Do not place any liquids on the unit or in its immediate vicinity and never pour liquids over the unit. Liquids could get into the unit, affecting safety and damaging the unit. There is a risk of fire or life-threatening electric shock!

If this should happen, switch off all poles of the corresponding mains socket (e.g. by switching off the automatic circuit breaker and the residual current circuit breaker). Then disconnect the mains plug from the mains socket. Disconnect all cables from the unit.

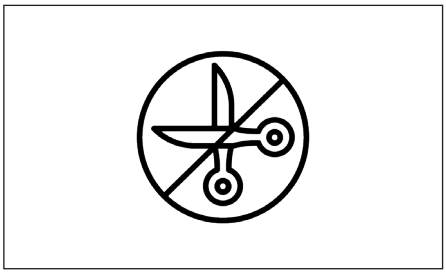
The entire product must then no longer be operated; contact your dealer or the manufacturer.

4.2. Unpack

Please keep the original packaging and the transport locks in a safe place! This is the only way to ensure safe storage and transport of the unit!

For devices that were not shipped in the original packaging, e.g. for maintenance or repair, or were improperly packed with it, we assume no liability in the event of transport damage!

If the 3D printer has a temperature below 10°C (e.g. immediately after delivery in cold weather) there is a risk of condensation of moisture from the warm ambient air onto sensitive electronic components. This can lead to damage to the control electronics during commissioning due to a short circuit. It is essential to allow the 3D printer to reach ambient temperature at the installation site for 24 hours before putting it into operation.

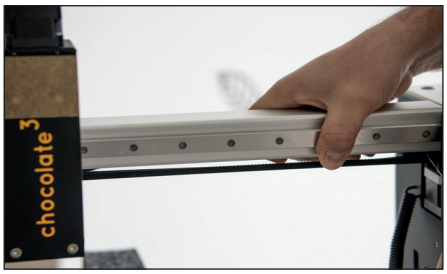


Open the packaging. Do not use pointed or sharp objects to avoid damage.

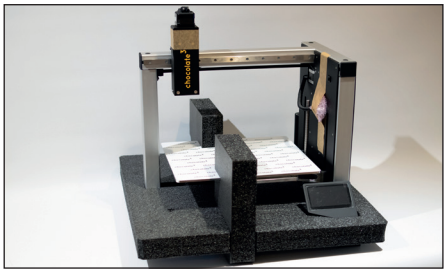
Remove the box with the accessories

Remove the top foam by pulling up evenly on all 4 sides alternately.

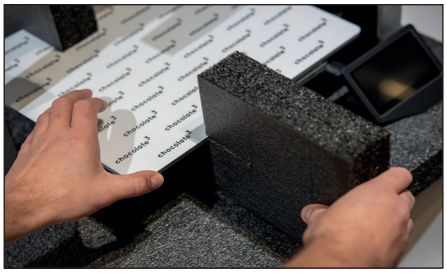
Grasp the printer by the upper crossbar, taking care not to squeeze the belt underneath.



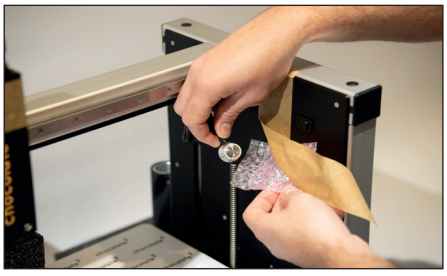
Remove the printer together with the lower foam from the packaging and put it down.



Remove the front and rear foam by pulling on it while holding the print bed (2).



Remove the packaging material from the Z-switch (6) and the adhesive tape from the printhead (1). Attention: The flap of the printhead (16) cannot be opened yet!

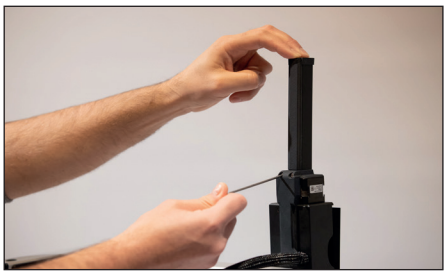


The Z button (6) can be magnetically attached about 5 cm below the power switch (5).

4.3. Structure

4.3.1. Guide attachment

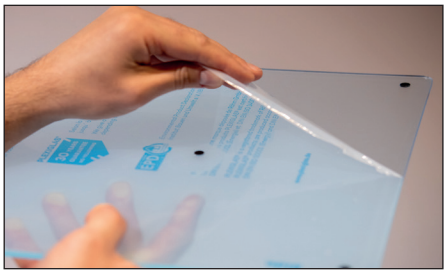
Place the printhead guide (7) straight onto the printhead. Push it all the way down and lightly tighten the two screws (23) at the back.



4.3.2. Preparing and attaching the printing plate

Remove the protective film from both sides of buildplate (3).

Place the buildplate (3) centered on the print bed (2).

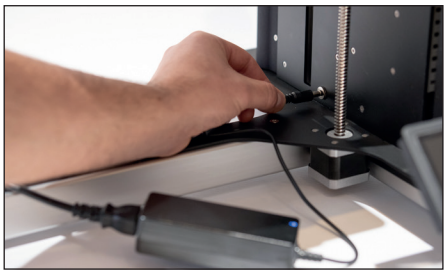


4.3.3. Power supply

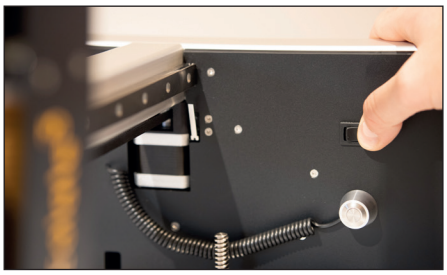
Connect the supplied mains cable to the power supply unit.

Plug the mains cable into a power socket.

Connect the hollow plug to the socket (9) on the printer.



4.4. Switch on



Press the power switch (5) and hold it down for about 5 seconds.

The printer needs about 1 minute to start up completely.

4.5. Levelling the print bed

The print bed is already levelled at the factory. However, the levelling can become misaligned during transport. Check the levelling as described in chapter 7.1.

4.6. Switch off

Caution: Do not simply disconnect the power supply, always shut down the printer first.

To do this, select Home -> Shutdown -> Yes

Shutting down takes about one minute. Afterwards you can safely pull out the mains plug.

4.7. Connection between printer and computer

The printer can be operated individually or in a network. We recommend that you connect it to a network with Internet access.

Without a network connection, only files on the choc mate or copied to the choc mate via USB stick can be printed.

If the choc mate is connected to a network, files can be transferred from any PC, smartphone or tablet. An internet connection is not absolutely necessary. However, without an internet connection, the choc mate does not set the time automatically and no updates are loaded.

4.7.1. Connection via USB stick

Alternatively, files can be copied from the computer to a USB stick and then copied from the USB stick to the choc mate.

4.7.2. Wired via router

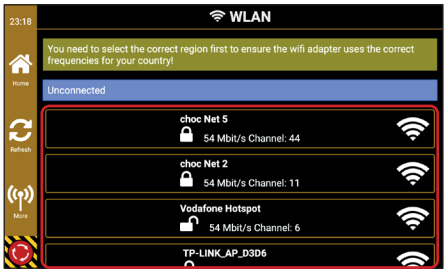
Remove the cover from the network socket (13). Plug in a network cable connected to the router.

The connection will be established automatically. Otherwise, contact your system administrator. For more information, see point 6.10.2..

4.7.3. Wireless (Wlan) via router

Navigate to Home -> Settings -> WLAN

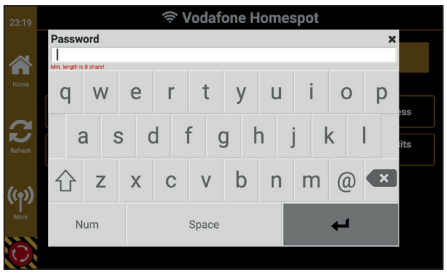
Select your network from the list.



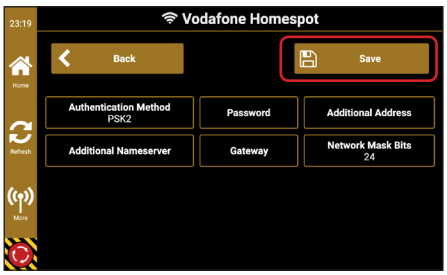
Tap Password.

Enter the password for your network.

If necessary, further settings can also be made here.
See also chapter 6.10.3



Save the settings and tap Connect.

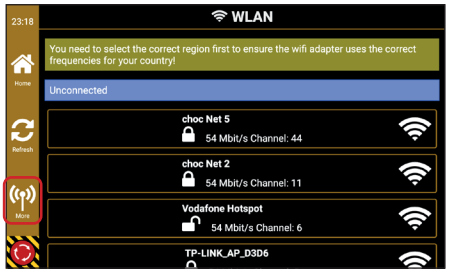


4.7.4. Wireless direct connection (hotspot)

We recommend switching off the access point Never activate AP, when it is not in use (e.g. when connecting via an existing network).

We also strongly recommend changing the password for the access point when it is in use.

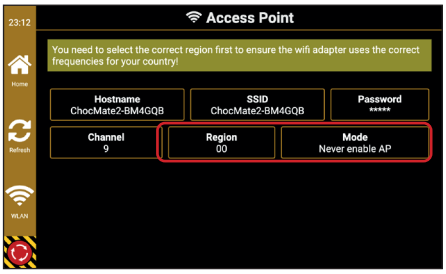
Navigate to Home -> Settings -> WLAN -> More (in the left sidebar)



Set the correct region for your country and change the mode to

Always enable AP to always enable the Access Pont.

Enable AP when not connected And to activate the access point only if no WLAN connection is possible otherwise.



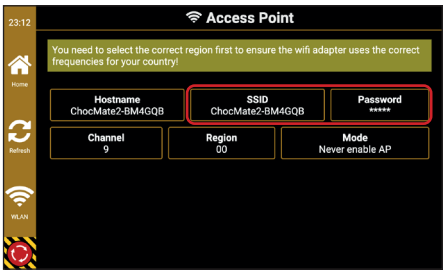
The wireless network of the access point is named by default

ChocMate2-****

****** corresponds to the last 6 characters of the serial number*.

The default password is

123456



*: The serial number can be found on your invoice, the packaging of the choc mate 2 and the type plate on the back of the printer.

5. Operating the printer

5.1. Important terms

Homing

Refers to the process of referencing the axes (X, Y, Z and E) of the choc mate. Without this process, the choc mate does not know the position of each axis.

This process must be repeated occasionally for individual axes.

Extrude

Refers to the process of material being pressed out of the print head.

Babysteppping

Refers to a change in position of the Z axis in small steps without changing the indicated position. It is used to correct errors in the distance between the nozzle and the print surface.

Retraction

Refers to the process of retracting the piston to prevent material from oozing.

5.2. Switch-on routine

Every time you switch on, the choc mate guides you through the most important steps.

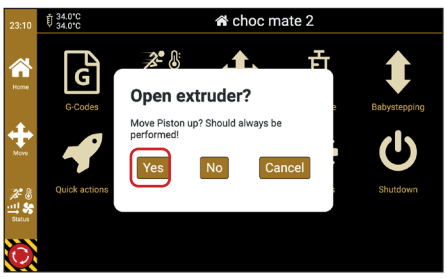
Open extruder

Moves the piston and the threaded rod to the uppermost position. This is the only way to open the print heads door (16).

This procedure should be carried out every time the printer is started. The only exception is if the printer has been restarted due to a problem and there is still chocolate in the cartridge.

If there is no cartridge in the printhead, please keep it closed with your hand during the entire process.

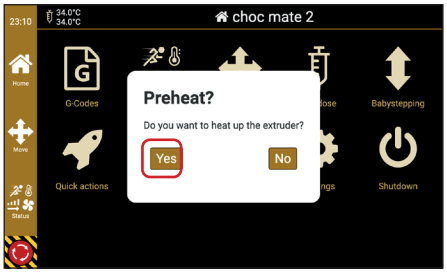
„Cancel“ ends the complete switch-on routine.



Preheat

Heat the print head to the appropriate temperature for our white, dark and milk chocolate sticks. This step can be skipped and done later if necessary.

Note: The stored temperatures are only guidelines and depend on factors such as chocolate, ambient temperature, desired print quality and the time the chocolate has already been preheated.



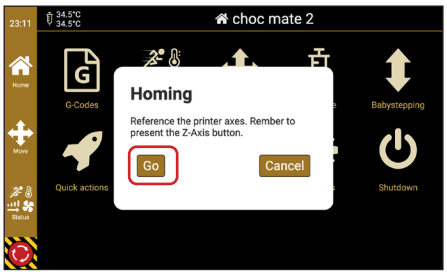
Now insert either an empty cartridge with nozzle or a full cartridge with nozzle into the print head as instructed.

Homing

We recommend carrying out the procedure immediately so that it cannot be forgotten later.

For homing, a cartridge with nozzle must be inserted and the printhead must be completely closed. A magnetic buildplate must be placed on the print bed. The cartridge does not necessarily have to contain chocolate.

See also chapter 5.5.

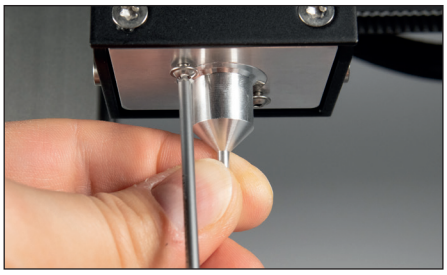


5.3. Preparations for printing

5.3.1. Attaching a nozzle element

Loosen the two screws (20) at the bottom of the printhead, attach a corresponding nozzle element (14) and slightly tighten the two screws (20) again.

See also chapter 5.9.3.



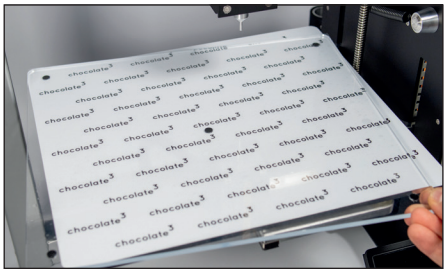
5.3.2. Preparing and attaching the printing plate

Apply some neutral cooking oil evenly and thinly to the top of the buildplate (3).

Place a foil in the middle of the buildplate (3) and smooth it out. From the centre, brush out as many air bubbles as possible.

Place the buildplate (3) centered on the print bed (2). The magnets will align it automatically.

For a particularly precise alignment, you can align the buildplate with the edges of the print bed.



5.3.3. Preparing and applying the piston

Fit one of the sealing rings supplied to the piston (15) in each of the two grooves provided.

Note: to open the print head door, the piston and the threaded rod must be moved all the way up!

Open the print head and screw the prepared piston (15) onto the threaded rod from below.

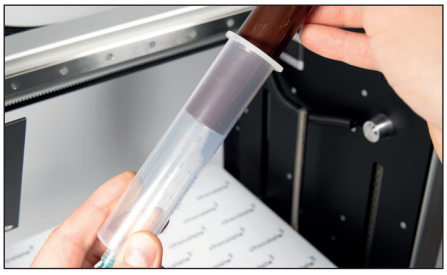
Make sure to screw the piston on completely, otherwise the height of the empty point of the cartridge may not be correct.

5.4. Inserting a cartridge

Fit a cartridge with a nozzle that corresponds to the diameter of the nozzle element (14) used or replace it with one of a corresponding diameter.

To do this, place the nozzle on the tip of the cartridge and screw it down slightly.

Now place a chocolate stick in the cartridge with the pointed side down and press it all the way down.



Insert the prepared cartridge into the print head (1).

Note: Check that the set temperatures match the chocolate type.

Preheating takes at least 45 minutes. Only after this time the chocolate is soft / liquid and the printing process can be started.

5.5. Homing

Make sure that there are no objects on the buildplate during homing!

During homing, individual or all axes are referenced against a switch. For the X and Y axes, the procedure only has to be carried out once when switching on.

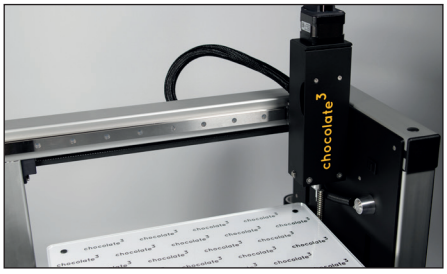
For the extruder (E axis), the process is automatically queried when a cartridge is changed.

The Z-axis must always be rehomed as soon as the distance between the printing surface and the nozzle changes. Reason for this can be:

- A new cartridge
- A new nozzle
- A different printing plate
- A different object to be printed

If this distance has changed, or could have changed, the homing process must be repeated for the Z axis.

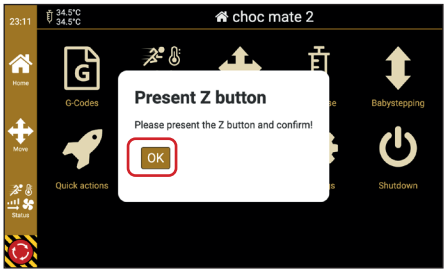
The printer references the X and Y axes, moves to the centre and lowers the print bed.



Place the Z button (6) centrally under the nozzle.

The Z button (6) is held in the centre by a magnet.

Confirm that the Z button (6) is under the nozzle.



Caution Danger of crushing! Do not place any objects or body parts underneath the nozzle.

If necessary, the Z-axis can be blocked by exerting force on the print bed.

5.6. Pre-dosing

Initially there is still air between the surface of the chocolate and the piston. This must escape completely before printing.

You can move the piston down quickly until the first chocolate comes out of the nozzle. After that, you should only proceed in slow mode.

Initially, you can proceed in larger steps. As soon as the piston gets closer to the chocolate, the steps should become smaller.

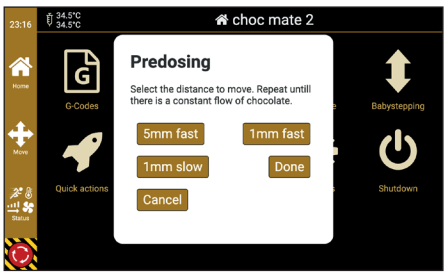
Open the print head and insert the wire on the front of the cartridge about 5mm into the chocolate.

Close the print head (1) completely.

Navigate to **Home** -> **Pre-dosing**.

Move the piston down until the first chocolate comes out.

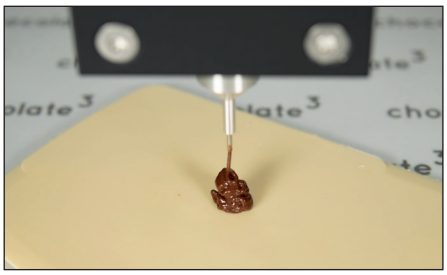
Remove the wire by pulling it upwards.



Now slowly dispense another 1-2 mm of chocolate from the cartridge until an even flow of chocolate is ensured.

End the process with „Done“ and a retraction will be performed.

If the process is cancelled with **Cancel**, no retraction is carried out.



5.7. Using the preheater

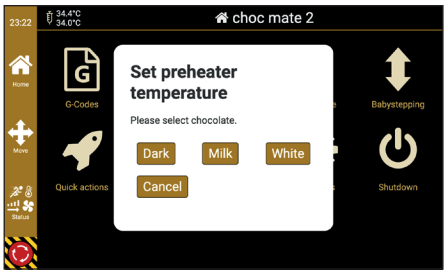
The preheater can be used to preheat the next cartridge. The temperature can be controlled independently of the print head to also preheat another type of chocolate.

Switch the preheater off again after removing the cartridge.

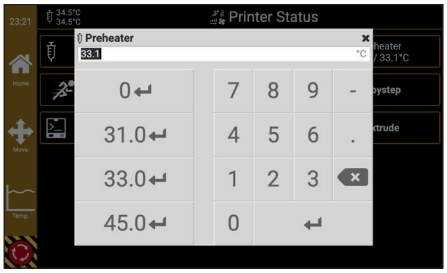
If the new temperature is lower than the previous temperature, wait until the temperature has dropped far enough before inserting the cartridge.

Preheating takes about 45 minutes. Only after this time is the chocolate soft / liquid.

The temperature for chocolate sticks can be set to a default value via Home -> Temperatures -> Preheater.



An individual temperature can be set via Home -> Status -> Preheater.



Insert a chocolate stick into a clean cartridge and close it with a sealing cap. Close the top of the cartridge with the lid.

Insert the cartridge into the preheater (8) and press it all the way down.

5.8. Print

We generally recommend starting with finished files that have already been loaded onto the printer. Otherwise, it is difficult to diagnose errors between the print file, chocolate and printer settings, especially at the beginning.

We also recommend starting with chocolate sticks to reduce the possible sources of error.

In the further course, you can also use your own files created via choc OS.

We only recommend using self-tempered chocolate if you have sufficient experience in chocolate processing. This must be tempered, liquid and filled without lumps or air bubbles. The temperatures must be adjusted accordingly depending on the variety and brand.

We can only provide limited support for misprints with self-tempered chocolate.

Checklist before starting a printing process

- ☑ Homing carried out
- ☑ Buildplate with foil inserted
- ☑ Chocolate inserted and sufficiently melted
- ☑ Sufficiently pre-dosed
- ☑ Temperatures set correctly
- ☑ Nozzle diameter corresponds to print file
- ☑ Ambient temperature approx. 19 °C

The essential ingredient of chocolate or couverture is the fat cocoa butter. Cocoa butter forms different crystal structures during crystallisation. Only one of them is stable and produces a satisfactory result. **Therefore, chocolate must always be used tempered or pre-crystallised! We strongly recommend making a sample. The sample should start to crystallise after approx. 20 seconds.**

As the crystal structures in tempered chocolate changes over time, the consistency or viscosity also changes. This change can have a negative impact on the printing result. We therefore recommend that the cartridges are always used up completely and as quickly as possible.

The process can be counteracted with limits by increasing the temperature. As a guide, you can use about 0.1 °C per hour.

The consistency should be kept the same throughout the printing process to obtain consistent results.

Advice on the optimum consistency for processing can be found at:

https://choc-mate.de/***

Please refer to the appropriate technical literature for information on tempering chocolate.

In general, we recommend a slightly firmer consistency for 2.5D prints and a slightly more fluid consistency for printing just one layer

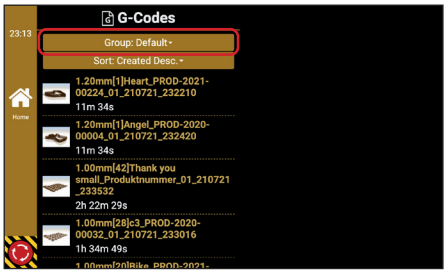
.

A non-optimal ambient temperature can be compensated with restrictions by adjusting the print-speed.

Both the „blob“ during pre-dispensing and the „purge line“ at the beginning of the print can be used to check the consistency and as a sample.

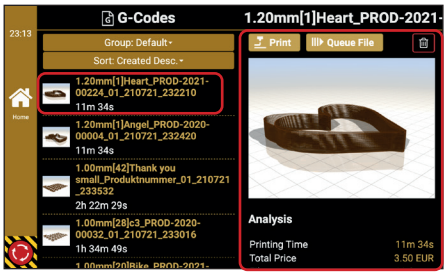
When printing, the chocolate of the previous layer should already be slightly solid before the printer applies the next layer..

5.8.1. Start



Navigate to Home -> **G-Codes**.

At the top you can switch between different groups and change the sort order.



Select a file by tapping on it.

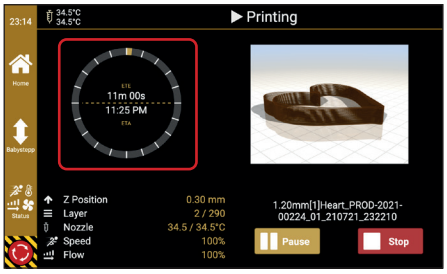
Further information on the file is now displayed in the right half of the screen.

Tap **Print** at the top of the screen.

The display changes to information on the printing process.

In addition to the most important settings, you will also see information about the printing progress.

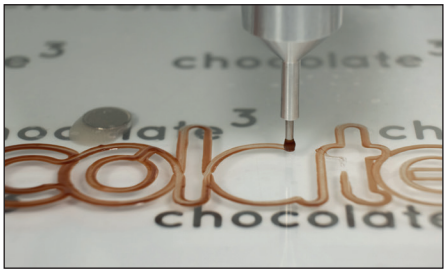
Pay particular attention to the first layer, as this is literally the foundation for successful printing.



5.8.2. Babysteppping

If the distance between the nozzle and the surface is not right, it can be easily corrected using the **Babysteppping** command in the sidebar. Signs of incorrect spacing are:

- A nozzle that scratches the surface
- A line that is too wide or excess material on the nozzle
- A line that is not continuous

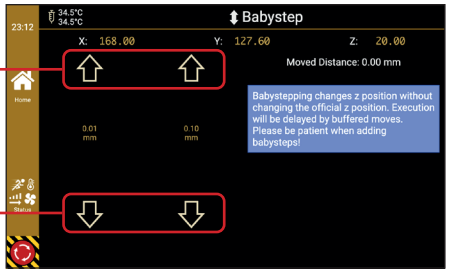


Arrow up: Decreases the distance

Arrow down: Increases the distance

Depending on the deviation, you can proceed in steps of 0.1 mm or 0.01 mm.

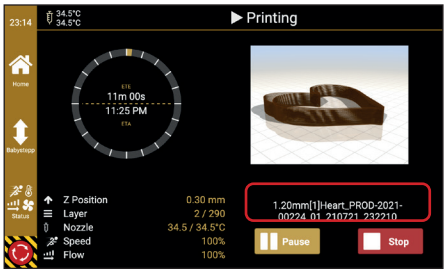
As the printer works with a command memory, it may take a short time until the changes are implemented.



5.8.3. Pause / Cancel

We recommend that you do not pause the printing process, as a pause will impair the printing result. In individual cases, the printing process can be interrupted by tapping the **Pause** button. The printing process can be resumed by pressing the **Continue** button.

If the printing process is to be cancelled, tap **Cancel** and confirm.

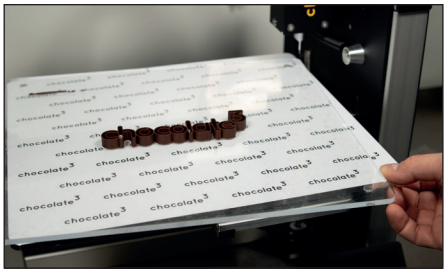


5.8.4. Removing the print objects

Caution: Wait until the printer stops moving before reaching into the printer.

At the end of the printing process, the magnetic buildplate (3) can be removed.

To do this, do not pull the buildplate (3) upwards, but first push it to the side and then remove it.

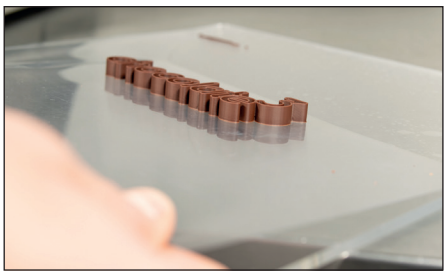


Depending on the ambient temperature, the chocolate needs another 1-10 minutes to finish crystallising. A completely solid chocolate is the basis for removing the print objects. If necessary, briefly place the buildplate (3) in a cool place.

To remove the print objects, grab the film on the buildplate (3) and pull it to the side and slightly upwards at a very flat angle.

The print objects should now come off slowly. If the angle is too steep, there is a risk that the print objects will break.

If the objects have not yet completely detached from the film, the film can be detached by bending it from the underside.



Note: We recommend not to remove the print objects on the print bed (2), but to remove the buildplate (3) and remove the objects on a solid surface.

5.9. Changing the cartridge, piston and nozzle

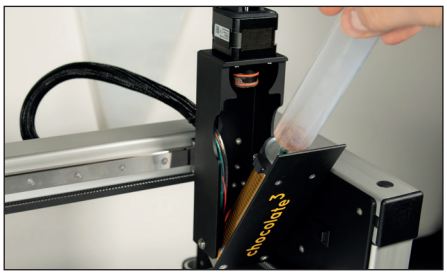
The print head has a switch that interrupts the printing process as soon as the cartridge is empty and moves the piston upwards. This step can also be performed manually at any time via Home -> Quick Actions -> Open extruder.

We recommend always using clean and dry nozzles, cartridges and piston. Especially when changing the chocolate type, all three elements should be replaced.

5.9.1. Changing / refilling the cartridge

Move the piston (15) all the way up, if not already done.

Open the extruder door (16) and remove the cartridge together with the nozzle upwards.

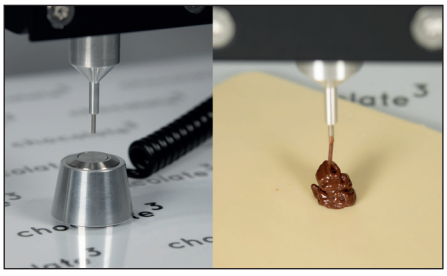


Now fill it up or replace the cartridge with a full one.

If necessary, wait until the chocolate has melted completely.

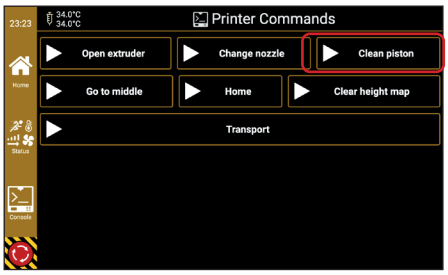
Re-reference the Z axis.

Pre-dose until the chocolate comes out evenly.

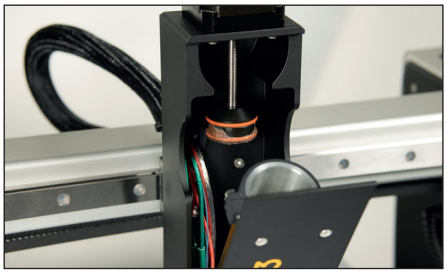


5.9.2. Changing the piston

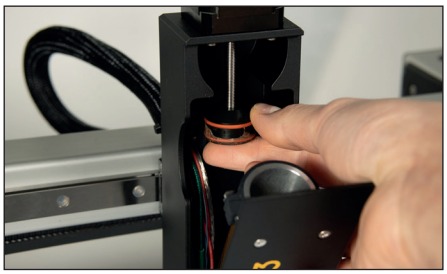
Navigate to Home -> Quick actions -> Clean piston and follow the steps shown.



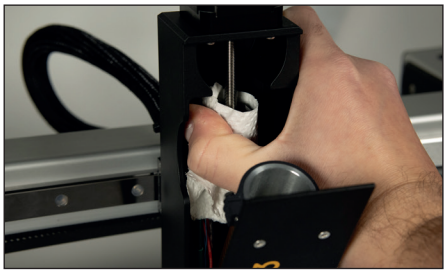
The piston (15) moves upwards so that the print head (1) can be opened. In the next step, the piston (15) moves down a little. This makes it easier to reach.



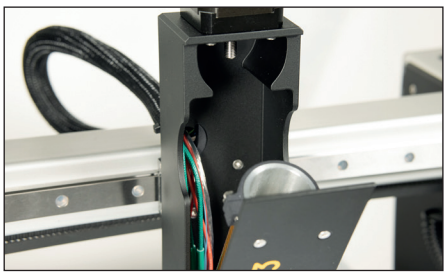
Remove the piston (15) by turning it clockwise (viewed from above), attach a fresh piston (15) if necessary and confirm.



To keep the print head (1) clean, it may help to wrap a piece of paper around the piston (15) while removing it.



The piston (15) moves up again and the print head (1) can be closed again.



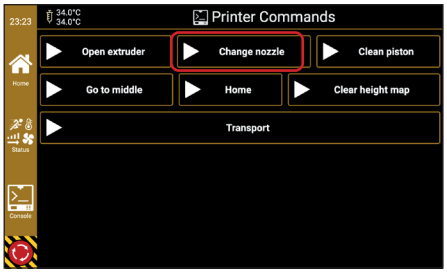
5.9.3. Changing the nozzle

The nozzle and nozzle element (14) can both be replaced with the cartridge in place and with the cartridge removed.

Always change the nozzle element (14) to the appropriate size as well.

After changing the nozzle, the Z axis must be referenced again!

Navigate to Quick Actions -> Change nozzle and follow the steps shown.



a) Change with cartridge removed

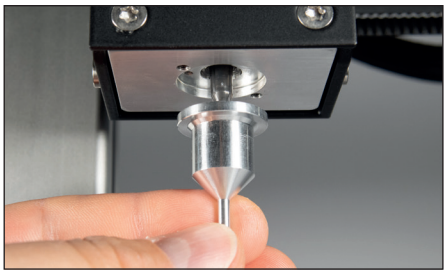
Loosen the screws (20) and remove the nozzle element (14) to the side.

Replace the matching nozzle element (14) from the side and tighten the two screws (20).

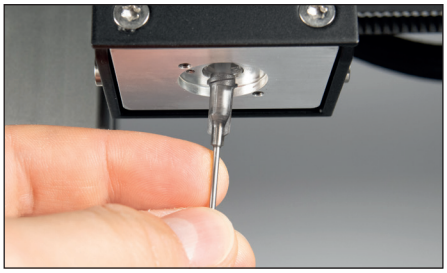
Replace the nozzle on the cartridge by unscrewing and screwing it back on.

b) Change with inserted cartridge

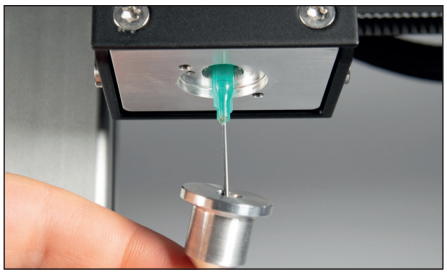
Loosen the screws (20) and remove the nozzle element (14) downwards.



Replace the nozzle by unscrewing and screwing it back on.

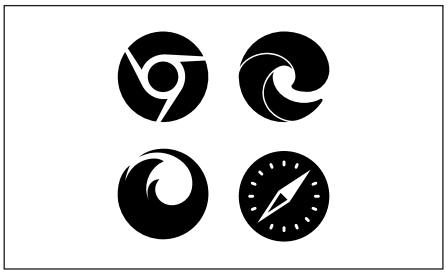


Replace the matching nozzle element (14) from below and tighten the two screws (20).



5.10. Copying print files

5.10.1. Web Interface



Open a browser of your choice on your computer, tablet or smartphone.

The web interface of the printer can be accessed either via the IP address (see 6.10.2.) or via

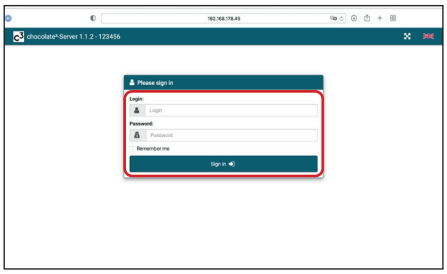
http://ChocMate2-****.local**

where ****** corresponds to the last 6 characters of the serial number*.

http://ChocMate2-****.local**

or for example

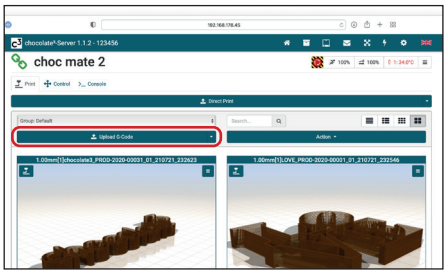
http://192.168.178.33



Log in as follows:

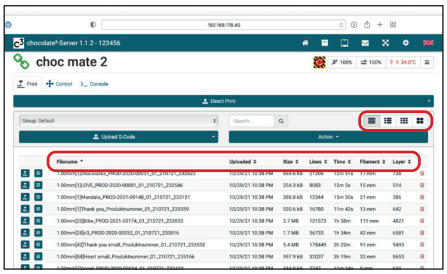
User: **user**

Password: **user**



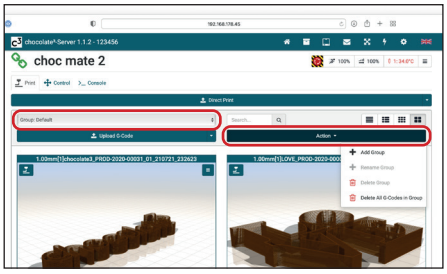
You can upload files to the choc mate by dragging them onto Upload Gcode or clicking on it and selecting the appropriate file.

The selection on the right can be used to change the view of the files. Switch to one of the list views to change the sorting order by clicking on the header.



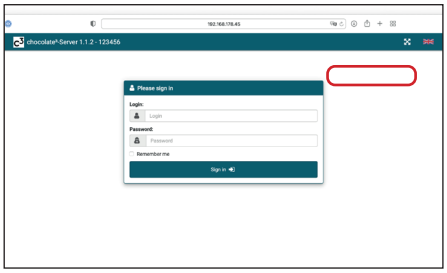
Groups can be selected via the dropdown.

Groups can be created via the **Action** button in order to structure the files.



You will find the complete instructions under **Instructions**. Note that many functions are not available to the user „user“.

For further configuration options, please contact the manufacturer.



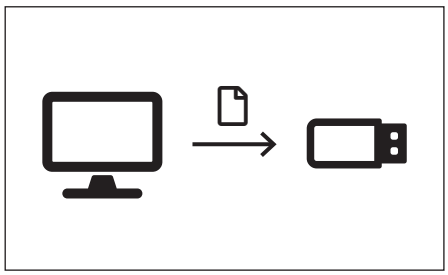
Note: We recommend that you only change settings using the touch display built into the printer and only start print jobs from there.

*: The serial number can be found on your invoice, the packaging of the choc mate 2 and the type plate on the back of the printer.

5.10.2.USB

Note: The storage medium must be formatted in ex-FAT or vFAT format.

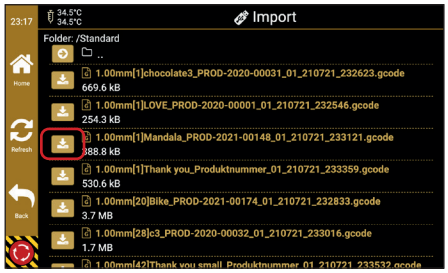
Copy the desired .gcode print files from your computer to a USB-C USB stick. It is possible to use folders.



Remove the cover on the USB socket (12) on the printer and plug in the stick (not included).

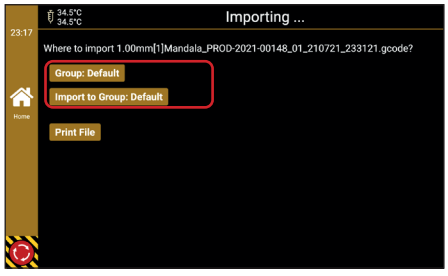
Navigate to **Settings** -> **Import** and select the appropriate device. Usually, it should be **USB 1**.

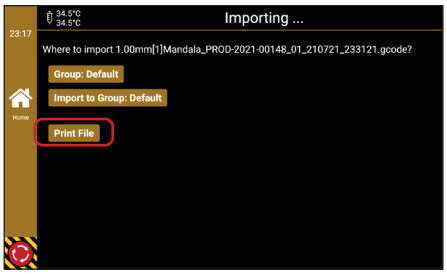
Select the desired file by tapping on the icon on the left.



If you import the print file, it will also be available on the machine in the future.

A group can be selected into which the print file is imported.





If printing is started directly from the USB stick, it is only stored temporarily.

The USB stick can be removed after starting.

6. Printer menu

6.1. Navigation

The printer is controlled via the touch display built into the printer.

The starting point is the Home page, which can be reached at any time via the sidebar.

Individual entries are selected by tapping the corresponding button.

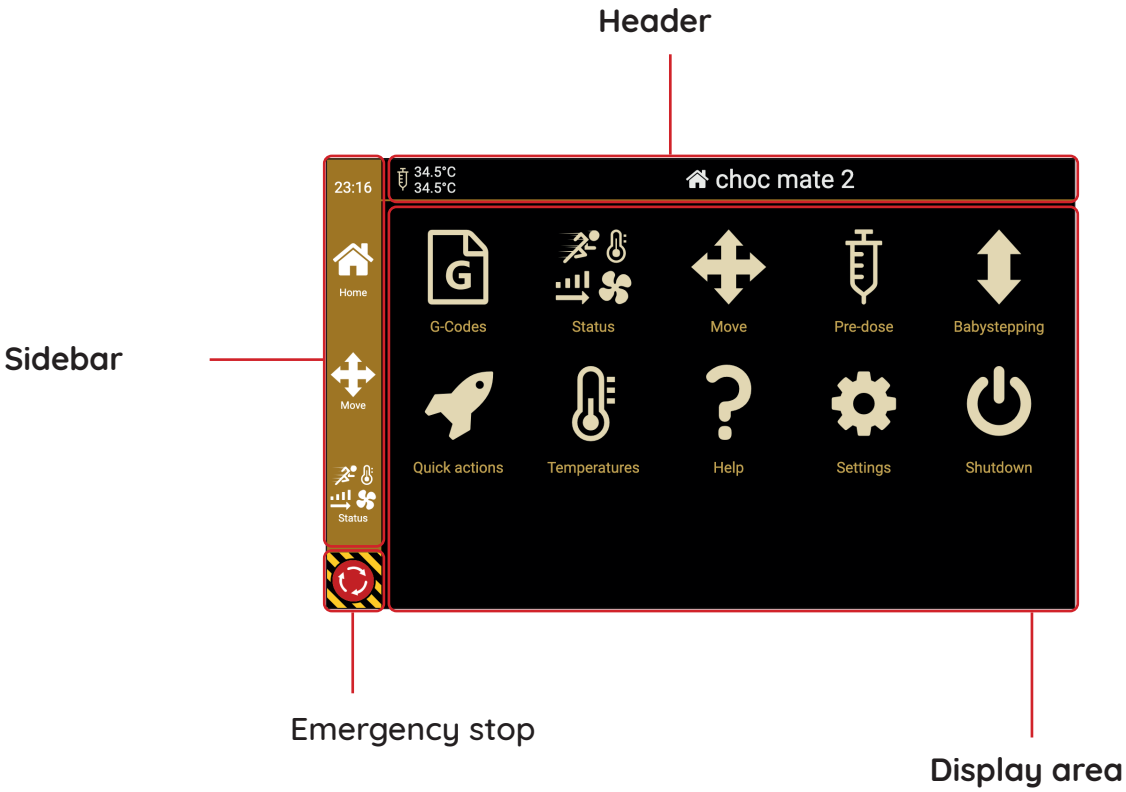
Note: not all commands may be triggered immediately, as the print works with a buffer for the next commands. Wait a few seconds before tapping the command again. In principle, successful entries are confirmed by a flashing of the title bar.

The layout consists of a sidebar, a header and a display area.

There are pages and windows. Windows only overlay the underlying page.

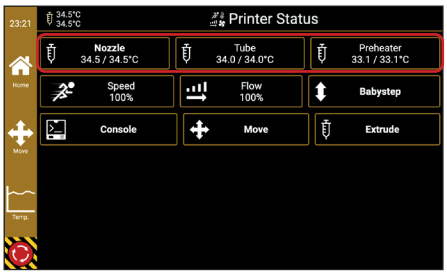
By swiping to the left or right, you can quickly switch between the most recently accessed pages.

Note: The emergency stop does not fulfil the classic emergency stop function of a hardware switch. After confirmation, all movements are aborted as quickly as possible and all heating elements are switched off.

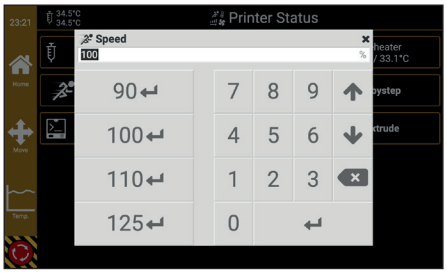


6.2. Status

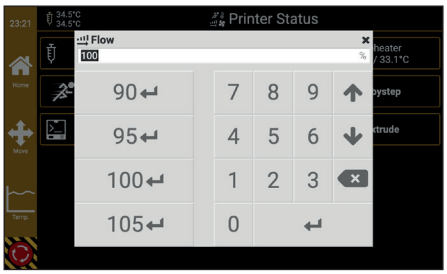
In the first line you can see the setpoint and actual temperatures of the individual control loops. By tapping on the individual buttons, the temperatures can be changed.



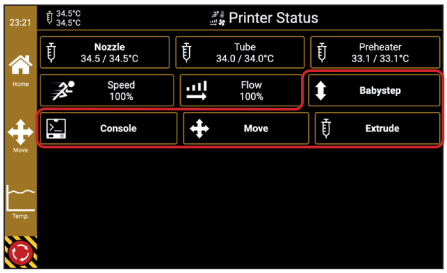
Under Speed, the print speed can be set as a percentage, with 100% being the speed set in .gcode.



Under Flow, the material feed can be set as a percentage. 100% corresponds to the material feed set in the .gcode.

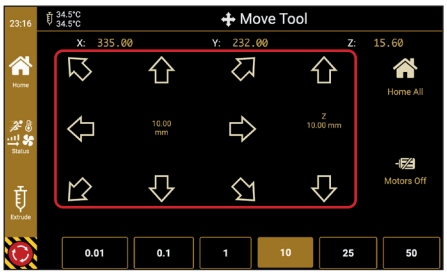


All other buttons are links to the respective pages

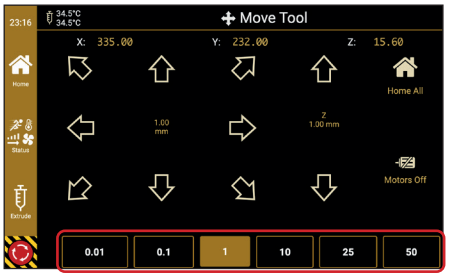


6.3. Move

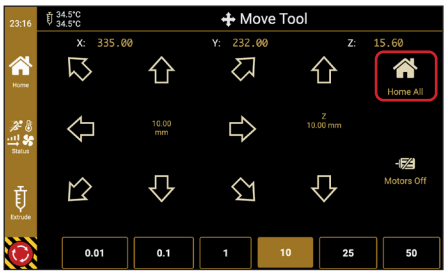
Note: the movement only works if all axes are referenced.



The print head and print bed can be moved by tapping the buttons. One tap corresponds to the selected distance.

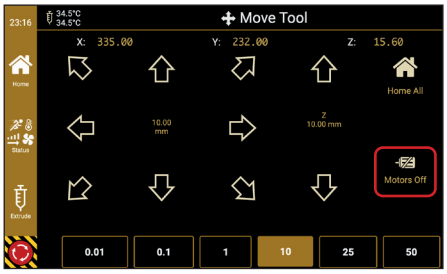


In the lower part, the distance to be travelled can be selected per tap.



The button can be used to trigger a homing of all* axes.

*: Axes X,Y and Z

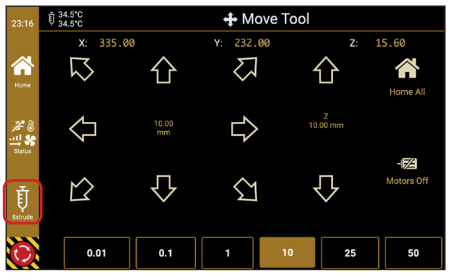


All motors can be switched off via the button. The individual axes can now be moved carefully by hand.

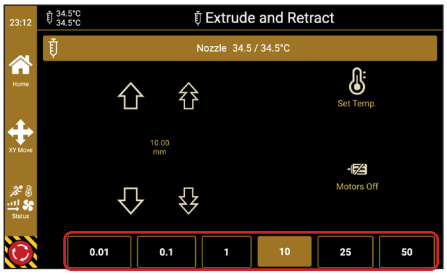
Re-homing of all axles is necessary before further use.

6.4. Extrude

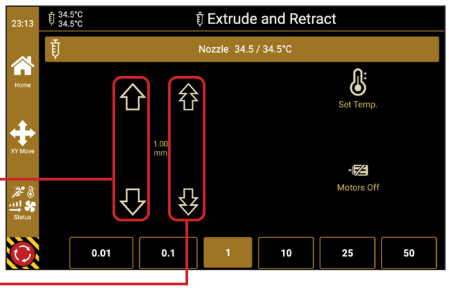
Note: Extruding is only possible if the temperature of the print head is above 25 °C.



Navigate to Home -> Move -> Extrude (in the left sidebar).



In the lower part, the distance to be travelled can be selected per tap.



The single arrow can be used to move slowly.

The double arrow can be used to move quickly..

Note: Always extrude in small increments and slowly if in doubt. Only use the fast stage if you are sure that no chocolate will be extruded during the movement.

6.5. Pre-dose

Opens a window for pre-dosing chocolate (see also chapter 5.6.)

6.6. Babysteppping

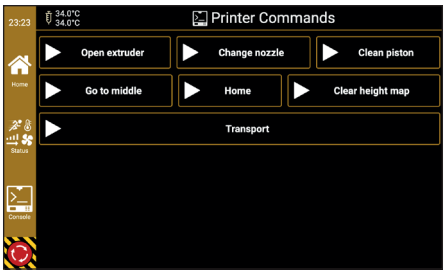
Opens the page for correcting the nozzle buildplate distance. See also chapter 5.8.2.

6.7. Quick Actions

Quick Actions (or Quick Commands) are commands or sequences of commands designed to simplify the use of the machine.

They guide the operator through frequently used operations and speed up or simplify them.

We recommend always using the quick commands wherever possible instead of carrying out the process manually. This way, additional points, such as referencing the Z-axis after changing the nozzle are also queried.



Open extruder

Moves the piston upwards to open the extruder.

Change nozzle

Moves the printhead to a position that facilitates nozzle replacement.

Clean piston

Guides the user through the necessary steps to remove / clean the piston.

Go to middle

Moves the printhead to the centre

Home

Executes a homing of the selected axes. Only individual axes can be referenced.

Clear height-map

Deletes the information to compensate for a uneven surface (e.g. a chocolate bar)

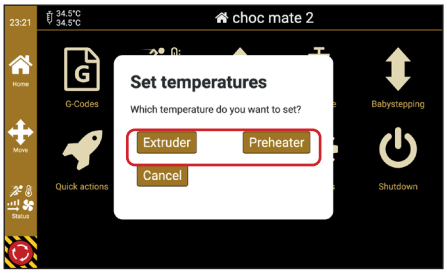
Transport

Moves all axes to a position where the unit fits back into the shipping box.

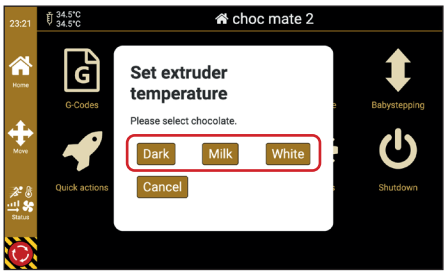
6.8. Temperatures

For individual temperatures see chapter 6.2.

Opens a window for setting the temperatures



In the first step, select whether you want to change the temperature of the extruder or the preheater.



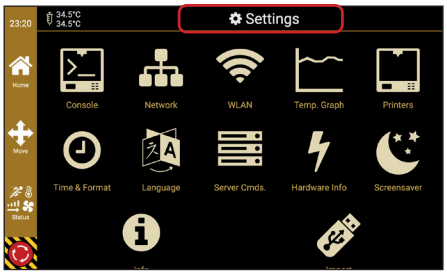
In the next step, select the desired type of chocolate. The respective temperatures are set and the process is confirmed by an information window.

6.9. Help

Opens a help page with the most important terms and commands.

This page is for quick reference only. If necessary, use our user manual or our online help.

6.10. Settings

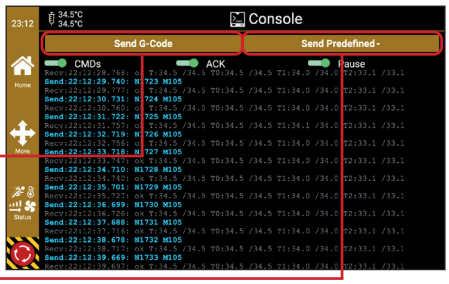


Leads to further information, settings and USB import.

6.10.1. Console

Caution: Use the command line with caution and only if you know exactly what you are doing. It can be used to override security mechanisms.

Command line in which special commands can be triggered or read out.

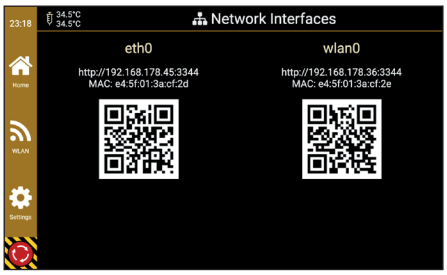


Button for sending individual commands.

Button for sending predefined commands.

Buttons to show / hide certain commands and to pause the display.

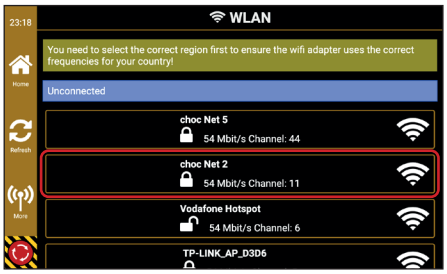
6.10.2. Netzwork



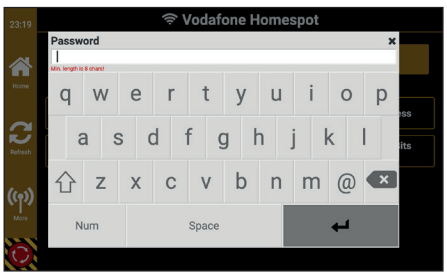
Displays the current IP address(es) of the printer and a QR code to access the web interface.

Either the displayed QR code can be scanned with a suitable device or the IP address can be entered in the URL bar of the browser.

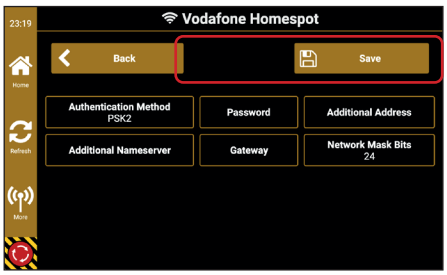
6.10.3. WLAN Settings



To connect to an existing network, select it by tapping it.



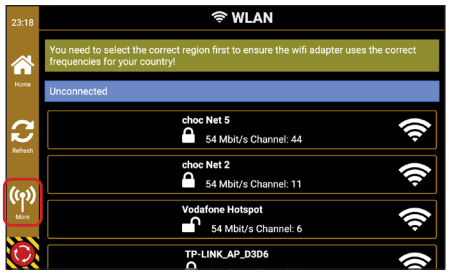
In addition to the password, other settings such as the authentication method, the DNS server and the gateway can also be set here. Contact your system administrator if necessary.



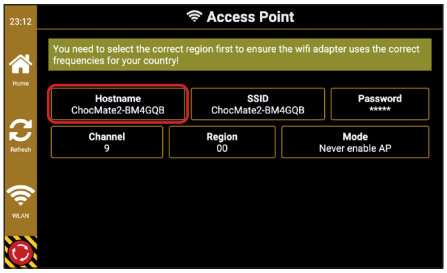
After entering the necessary information, tap Save and then Connect.

It may take a few minutes for the connection to be established. If no connection is established, please restart the printer.

Under **More** in the sidebar, further settings for the server and the access point can be defined.



The host name influences the address (http://ChocMate2-******.local) under which the server can be reached in addition to the IP address.



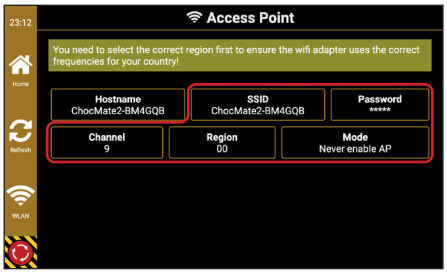
SSID: Name of the access point WLAN

Password: Password of the access point WLAN

Channel: Channel of the access point WLAN

Region: Affects the channels available in your country.

Mode: Influences whether or when the access point is activated.

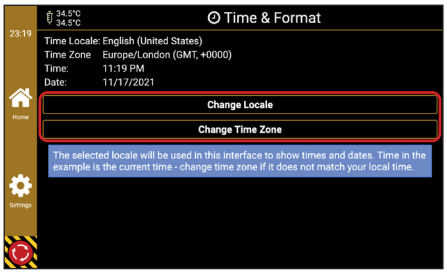


6.10.4. Time setting

The built-in Raspberry Pi does not have a time memory. If the power supply is interrupted and there is no internet connection, the time is reset.

The locale changes the formatting in which the date and time are displayed.

The current time can be set via the time zone.

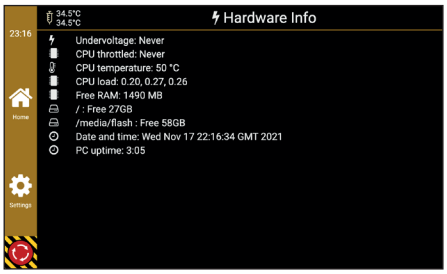


6.10.5. Language

The displayed language can be changed, but only changes part of the displayed dialogues. To adjust the full language, contact the manufacturer or dealer. We recommend leaving the language at factory settings.

6.10.6. Hardware Information

Shows information on the current status of the system



6.10.7. Information

Shows information about the current version and updates if available.

7. Maintenance and cleaning

7.1. Levelling the print bed

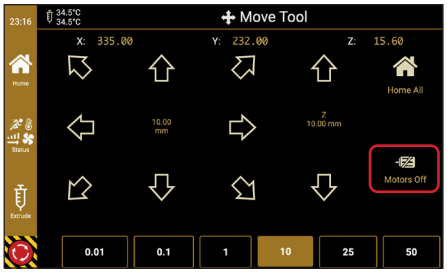
After transport, in case of problems with the first layer and at regular intervals, the levelling of the print bed should be checked and corrected if necessary.

Note: If the levelling is poor, make sure that the print head does not scrape over the buildplate.

This process takes some time and practice. The more accurately you do it, the fewer problems you will have when printing afterwards. The normal layer height is 0.3mm. This means that a deviation of 0.1 mm already means 33% deviation in the first layer.

If a satisfactory result cannot be achieved, check e.g. with a ruler whether the print bed is warped and replace it if necessary.

Deactivate the motors via Move -> Motors off.



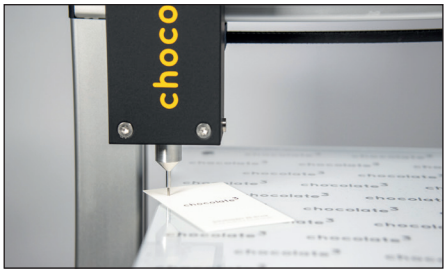
Move the print head (1) manually all the way to the right and the print bed all the way to the front. Turn the Z spindle until e.g. a sheet of paper fits exactly between the nozzle and the surface.

Carefully move the print bed (2) all the way back and check that the distance is exactly as at point 1. If not, turn the knurled screw (11) to raise or lower the corner of the print bed.

Repeat these steps until the distance along the entire right side of the print bed is equal. If there are significant deviations, the rear knurled screw can also be adjusted.

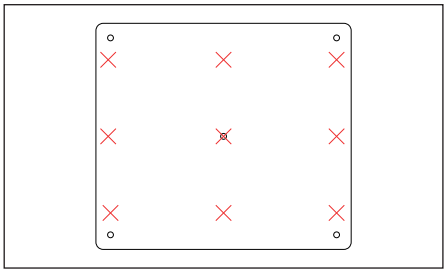
Now move the print bed to the centre.

Now carefully move the print head (1) all the way to the left and check the distance there as well.



If necessary, adjust the distance with the knurled screw on the left. This causes the entire print bed to tilt to the left or right. Repeat the process until the distance is the same along the entire width of the print bed.

Finally, check one more time a 3 screen across the entire print bed.



7.2. Cleaning the individual parts

Piston, cartridge, nozzle, buildplate and foil must be cleaned or replaced regularly.

We recommend replacing the film instead of cleaning it, as creases and scratches can cause problems with printing.

The piston, sealing rings, cartridge and nozzle can also be cleaned in the dishwasher. Pre-washing by hand is recommended.

The buildplate is not dishwasher safe.

Compressed air may be useful for cleaning or drying the individual parts.

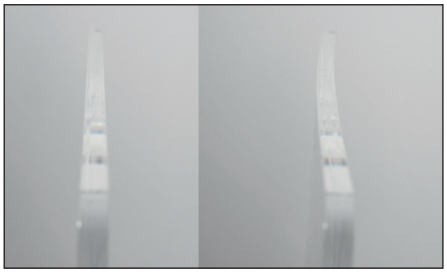
Please also note the maintenance schedule in chapter 7.6.

Remove all parts from the printer.

Remove the sealing rings and clean all parts with hot water, soap and a brush.

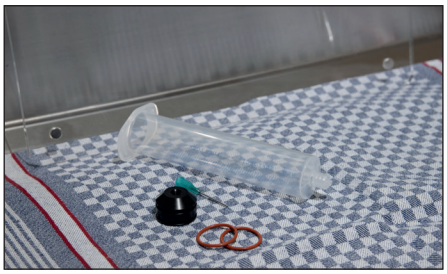
After cleaning, make sure that the buildplate is still straight.

If necessary, realign it as described in 7.3.

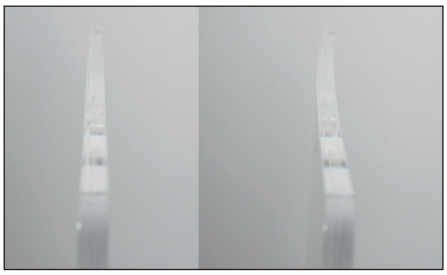


Dry all parts thoroughly.

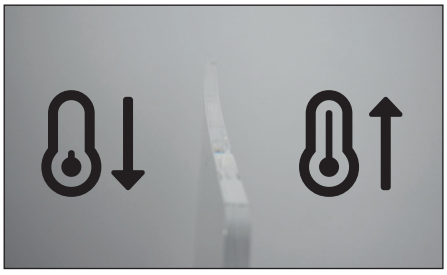
We recommend leaving piston, nozzles and cartridges to dry at least overnight.



7.3. Aligning the buildplate



The buildplate is made of acrylic glass, which tends to warp with temperature changes (e.g.: hot water).



This can be easily corrected by cooling the outward curved side or heating the inward curved side.

Warm or cold water or a hairdryer are suitable.

Check again that the buildplate is now straight in X and Y direction.

7.4. Cleaning the printhead

If necessary, the print head can be disassembled to facilitate cleaning.

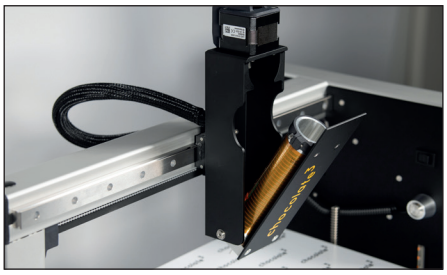
Warning: Shut down and disconnect the printer from the power supply before disassembling the print head.

Warning: Do not pull the cables or leave any parts hanging on the cables.

Please also note the maintenance schedule under 7.6.

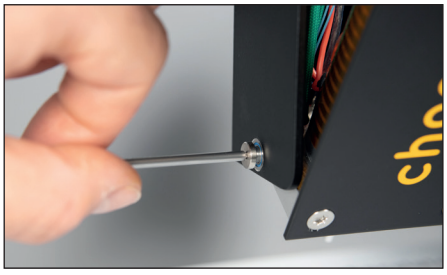
Open the door (16) of the extruder (1), remove the nozzle element (14) if necessary and shut down the printer.

Disconnect the power supply.

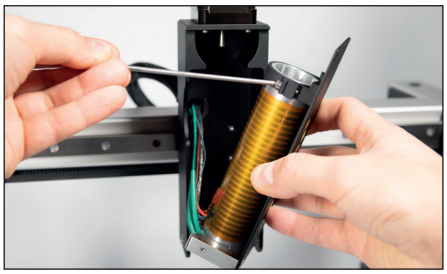


Remove the two screws (18)

(The screws are symmetrically located on the left and right side of the print head).



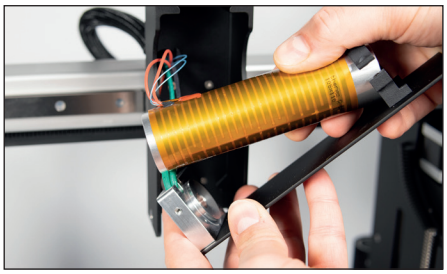
Loosen the screw (19) and push the tube (17) up a little.



Clean all parts with a damp cloth with a little soap.

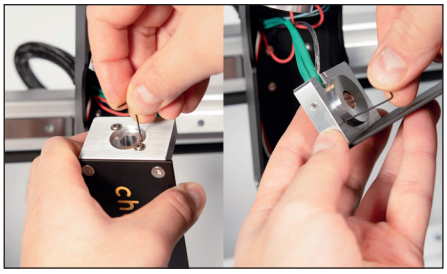
If necessary, the printhead (1) can also be disassembled further. The tube (17) can be removed diagonally downwards. The screw (19) must be completely removed for this.

Attach it to the print head with some tape, for example, so that it does not hang on the cables.



Caution: Let the printer cool down for at least 15 minutes before removing the heating element. It may still be hot and cause burns.

Now loosen the two threaded pins. Then the heating element and temperature sensor can be carefully removed towards the back.



Clean them with a damp cloth and some soap.

The extruder door with heating block can be cleaned under running water if necessary.

Allow all parts to dry completely before reassembling the printhead (1).

Reassemble in reverse order.

Make sure that the cables of the tube (17) point towards the remaining cables in the left rear corner.

7.5. Cleaning the printer

Warning: Shut down and disconnect the printer from the power supply before cleaning the printer.

All surfaces of the printer, with the exception of the linear rails, can be cleaned with a damp, soft cloth and a little mild soapy water.

If necessary, clean the linear guides with a dry, lint-free piece of paper or cloth.

Remove only excess grease and dirt if necessary. A thin film of lubricant should remain on the linear guide.

7.6. Maintenance

Minor maintenance work can be carried out by yourself. Follow the instructions below and the maintenance schedule.

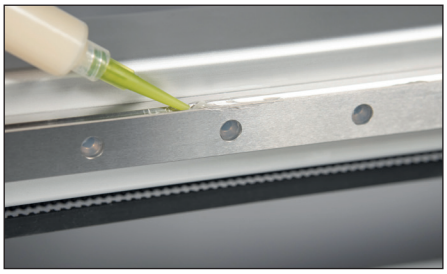
Warning: Shut down and disconnect the printer from the power supply before starting any maintenance work.

At least every two years, the unit must be fully serviced by trained personnel. The technical protective devices must be checked as well as the proper condition of mechanical components. We offer a maintenance service for this purpose. If you have any questions, please contact us at https://choc-mate.de.

	Daily	Weekly	Every 6 Month	Every 2 years
Cleaning the nozzle, cartridge and piston	x			
Replacing the foil		x		
Cleaning the buildplate		x		
Cleaning the print head	If required			
Cleaning the linear guides		x		
Cleaning the printer	If required			
Levelling the print bed	if required (or after 3 months)			
Lubricating the linear guides			x	
Cleaning the extruder spindle			x	
Checking the belt tension			x	
Complete maintenance				x

7.6.1. Lubricating the linear guides

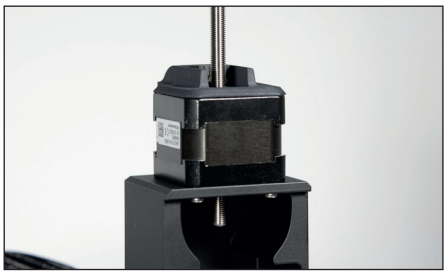
Clean the linear guides from dirt and excess grease.



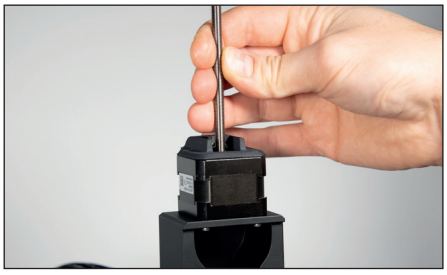
Apply some fresh grease and spread it evenly. Move the axle 2-3 times completely back and forth. Then remove any excess grease.

Note: Only use grease with H1 approval that is suitable for linear guides. Oil is not suitable for lubricating the linear guides.

7.6.2. Cleaning the extruder spindle

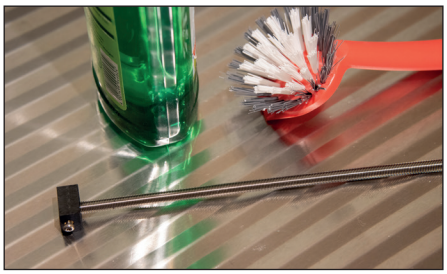


Remove the print head guide (7) and the piston (15).



Unscrew the spindle upwards in an anti-clockwise direction.

Note: Do not remove the sliding element (22) from the spindle.



Clean the spindle with running water, a brush and some soap.

Let the spindle dry completely and reinstall it in reverse order.

7.6.3. Checking the belt tension

The tension of the belts is crucial for low wear and a good print quality. The necessary tension causes them to elongate over time. Up to a certain point, this can be compensated for by re-tensioning.

The straps should be tight and produce a deep tone when plucked.

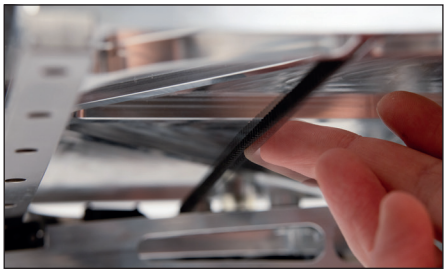
In no case should play should be present when moving back and forth!

The belts are replaced during maintenance (every two years).

It should be noticeably taut, but still be able to be pulled back a little.

Tension it, if necessary, by turning the screw of the belt tensioner. A TX10 spanner is required (not included).

(If necessary, you can loosen the belt, unhook it and shorten it by one tooth).



Check the tension of the Y-axis by moving the print bed (2) all the way forward and tugging on the belt at the bottom. It should be slightly tighter than the X-axis.

The belt cannot be tightened easily. Contact your dealer or the manufacturer if necessary.

8. Creating print files (choc OS)

choc OS is a web-based software (fee required) developed by chocolate³ to create print files for chocolate printing.

choc OS is available at

https://choc-mate.de/app.

Registration is required to download files. Enter your serial number* during registration to receive 6 months, free of charge use, of our „Standard“ subscription.

Please also see the separate instructions online.

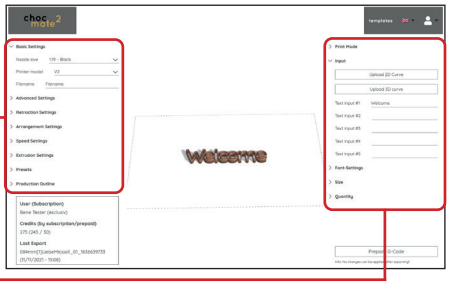
choc OS offers the possibility to create print files from templates, text and own vector files. You are charged in credits. One credit corresponds to one created print file.

We recommend using choc OS to create all print files. The use of other software (so-called slicers) is possible, even if they are not optimised for printing with chocolate! The use of third party software is at the risk of the customer! Some functions may not be available.

After successful registration and login, all functions are available.

The left side shows print settings.

The right side shows design settings.



Templates leads to a constantly growing library of template files. These can be loaded into choc OS, partially scaled, and exported as print files in any height and quantity.

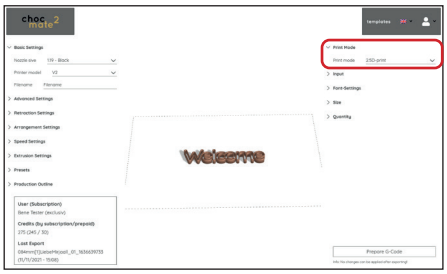
In principle, two modes are available:

Bar Mode

For printing not necessarily connected objects from only one layer.

2.5D Mode

For printing objects from several layers, each consisting of a single curve.

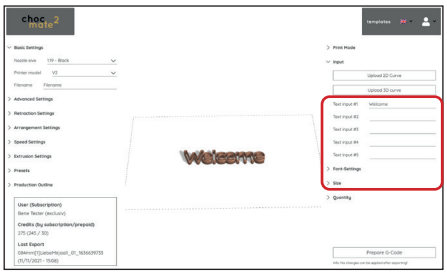


*: The serial number can be found on your invoice, the packaging of the choc mate 2 and the type plate on the back of the printer.

Text objects

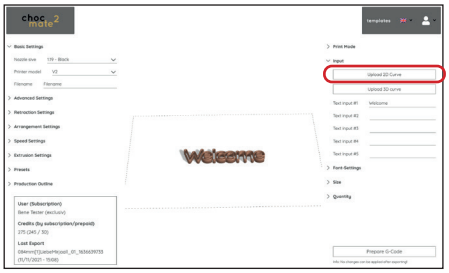
The entered text is automatically merged* and scaled.

Note the settings under **Font** and **Size**.



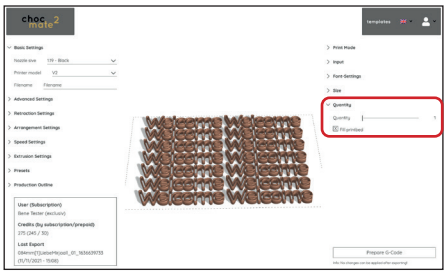
Custom designs

To print your own templates, you can upload 2D vector files in .dxf format. These must consist of individual self-contained curves per print object*.



Quantity allows you to set how many duplicates are printed in a job.

Fill bed places as many copies of the same object as possible in the available print area.



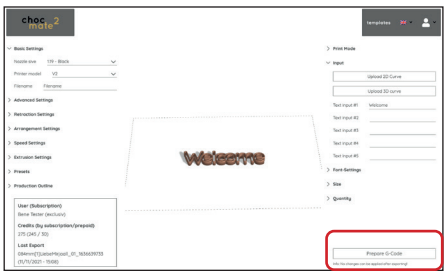
Own presets can be saved in **Presets**.

Production Outline provides a 2D curve for download. This can be used e.g. for adjustments or packaging.

By clicking **Prepare G-Code** and then confirming, the actual file is created.

At this point, one credit is consumed.

The file is then available for download and can be copied to the printer.



*: Only for printing 2.5D objects.

9. Additional information

9.1. Technical data / Product data sheet

Manufacturer	chocolate³ - Benedikt Daschner
Production	
Material	Cocoa butter-based chocolate and couverture
Method	Layered construction (FDM)
Build volume	340 x 232 x 160 mm (WxLxH) 12,6 litres | 12.675,2 cm³ | 792,2 cm²
Cartridge volume	approx. 80 g
Positioning accuracy	0,1 mm
Nozzle diameter	0,58-1,6 mm
Printing speed	3000 mm/min (max)
Traversing speed	X/Y: 12000 mm/min | Z: 300 mm/min | E: 180 mm/min (max)
Dimensions (approx.)	
Inactive	483x468x718 mm (WxLxH)
Active	483x545x718 mm *Print bed moves back and forth (WxLxH)*
Shipping box	600x600x670mm (WxLxH)
Weight	11 kg
Shipping weight	20 kg
Temperature	
Storage temperature	0 - 40 °C
Ambient temperature	18 - 22 °C
Heating	max. 45°C
Power supply	
Power supply	MeanWell GST60A24
Input	90 - 264VAC | 47 ~ 63Hz
Output	60W | 2,5A | 24V DC
Insulation class	I
Fuse protection	Short circuit | Overload | Overvoltage | Temperature
Connector	5,5x2,1mm PJ1 hollow plug 
Connectivity	
Wireless Lan	802.11 b/g/n/ac
Lan	RJ45 (10/100/1000)
USB	USB-C | 2.0

Note: Technical specifications are subject to change without notice.

9.2. Decommissioning

There are two possible reasons for decommissioning the 3D printer:

Temporary decommissioning for a limited period of time (e.g. due to a move).

Permanent decommissioning, if the 3D printer is no longer to be operated.

Temporary decommissioning

If you want to take the choc mate 2 out of operation for transport or storage, please note the following:

- Remove the cartridges, nozzle element, piston, buildplate and the guide.
- Move the print head shaft without the piston all the way down and tape the print head door shut.
- Disconnect the power supply and the network cable and store the cables together with the printer and all other accessories in the original packaging.
- Clean the 3D printer thoroughly, especially the print head.
- Repack the 3D printer in its original packaging.

To simplify the process, there is a command that moves all axes to the appropriate position so that it fits back into the original packaging. You can find it under Quick Commands -> Transport.

Final decommissioning

If the choc mate 2 is no longer to be used, or if it is damaged beyond repair, take the choc mate 2 out of service.

3D printer components can contain valuable elements (e.g. rare earths) or be reusable.

The choc mate 2 can be disposed of as a complete unit. You therefore do not have to disassemble or dismantle it before disposal. Only the cable and accessories can be handed over separately from the choc mate 2 to the electronic waste collection point.

Please observe the relevant national and local regulations. If disassembly or dismantling of the unit is required, please contact the manufacturer. Disassembly of the choc mate 2 by the user is generally not intended.

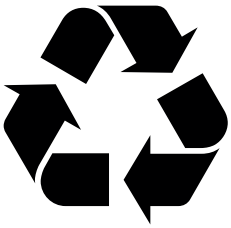
Please also observe the notes on disposal on the next page.

9.3. Disposal

Of course, we will gladly take back your old machine. Please contact us at info@chocolate3.de for this purpose.

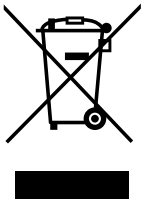
Packing

Please follow the regional regulations.



Device

Electronic devices do not belong in household waste, but must be disposed of properly - in accordance with Directive 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment. Please hand in this appliance at the end of its service life for disposal at the designated public collection points.



9.4. Important notes

Operation

You must not disconnect the unit from the mains during operation! This can lead to data loss, software and hardware damage.

Other

The information contained in these operating instructions is correct at the time of going to press. However, we reserve the right to make changes at any time without notice. If there is new software for your machine that affects the operating instructions (e.g. changing menus and/or functions), we will make a new operating instruction available for download at https://choc-mate.de/*** if we feel it is necessary.

9.5. Legal notice

Software changes / use of applications

Changes to the software of the unit as well as the use of applications not provided by the manufacturer will result in the loss of warranty! The costs for shipping and repair of devices caused by the use of software and applications not provided by the manufacturer are to be borne by you!

Therefore, only use software and applications for your device that are provided or approved by the manufacturer on request.

The manufacturer accepts no liability for the loss of data from internal or external storage media.

The software installed on the unit/product ex works is functional and of the quality usual for this type. Possible errors cannot be completely ruled out technically in the development of software. However, the software supplied is only defective if it is not usable for normal use with the device/product. A merely insignificant reduction in quality shall not be taken into account. A functional impairment of the software/programme resulting from hardware defects, environmental conditions, incorrect operation or similar is not a defect of the software.

9.6. Contact

chocolate³ - Benedikt Daschner

Korbinianplatz 2

85737 Ismaning

Germany

https://chocolate3.de

https://choc-mate.de

info@chocolate3.de

+49 (0)89 20942055