X350 3D-Printer Quick Start Guide

German RepRap GmbH

English versions are available at https://wiki.germanreprap.com/en/

Inhaltsverzeichnis

X350 3D-Printer Quick Start Guide

Congratulations for purchasing your professional X350 desktop 3D printer

Please note that the most recent version of this manual is always available on our websites. At the time of delivery, it may happen that the included instruction manual is out-dated, and there is more current information on the online documentation.

The stable construction and the high quality components make the X350 the ideal printer for industrial applications. The X350 is a reliable workhorse, regardless of whether you print for one hour or for several hours.

The landscape format printing bed allows for a more efficient use of the printing area, as most printed objects are not square. The integrated web interface is a highlight, as it enables printing through the wireless network or the LAN, and control through a browser interface. The X350 will print stand-alone, or integrated into the wireless network or the LAN while being controlled through a browser interface.

The X350 will print stand-alone, or integrated into the wireless network or the LAN while being controlled through a browser interface.

The German RepRap X350 3D printer is ready to use in just a few minutes, thanks to the user-friendly

tried and tested software Simplify3D™, an innovative filament management system with an automated feeder, and the easy to level 3-point printing bed.

The X350 runs with our most recent drive technology. The DD3-Extruder and the Full-Metal-Hot end are easy to control. The highlights: No adjusting necessary, and a variable contact pressure for soft materials.

Technische Daten

- **Material:** ABS (Acrylonitrile butadiene styrene-copolymer), PLA (Polylactic acid), PS (Polystyrol), PP (Polypropylen), PVA (Polyvinylalkohol), Wood, Laybrick in 1,75mm
- **Material management:** innovative filament management
- **Dimensions:** (B / H / T) 600 x 444 x 517 mm
- **Printing volume:** (X / Y / Z) 350 x 200 x 210 mm
- **Operating voltage:** 110/230V Wechselspannung
- **POWER CONSUMPTION:** 250 W
- **Power consumption:** ca. XXX W
- **Setup:** Prefabricated unit / Ready-to-print
- **Technology:** FFF (Fused Filament Fabrication)
- **Layer thickness:** ab 0,02mm
- **Printing speed:** 10 - 150 mm/s
- **Traverse speed:** 10 - 300 mm/s
- **Printing bed:** 3-Punktauflage, beheizbar bis max. 120°C
- **Network:** WLAN/Ethernet
- **Weight:** ca. 29kg
- **Nozzle:** 0,4mm

Content

- X350 3D-Printer
- 1 * Coil holder
- LCD Display (installed)
- SD-Card reader (installed)
- Heated ceramic printing bed (installed)
- Simplify3D™ Software
- 4GB SD-Card
- Spatula
- Cleaning brush
- Nozzle tool
- Quick Start Guide
- Ethernet network cable
- Power cord
- Filament sample

System requirements

These system requirements are exclusive to the use with the included software Simplify3D™.

- Intel Pentium 4 or better
- 2GB RAM or more
- USB from 1.1 optional
- Windows XP or newer
- Mac OS X 10.6 or newer
- Ubuntu/Debian Linux
- OpenGL 2.0

Starting up

Instructions

During shipment of the X350 it may happen that the limit switches shift. This should be checked, and adjusted.

Warning: Do not fasten the screws too tightly!

The heated printing bed (ceramic) of the X350 is covered in a PET film. ABS and PLA stick to this film very well. However, this film can get damaged, or lose adhesion after some use. In this case, you can acquire a new film from us.

The processing PLA (Polylactic acid) is also possible without the PET film on the printing bed. You can find further details about that in the Overview of filament types in our Wiki, or in the section of the same name within this instruction manual.

Setting up the printer

The printer is to be plugged into a 230V power outlet via the power cord. The included network cable allows you to connect the printer to the home network. This is also necessary if you want to use the printer through the wireless network later. For the first setup, an Ethernet connection is required.
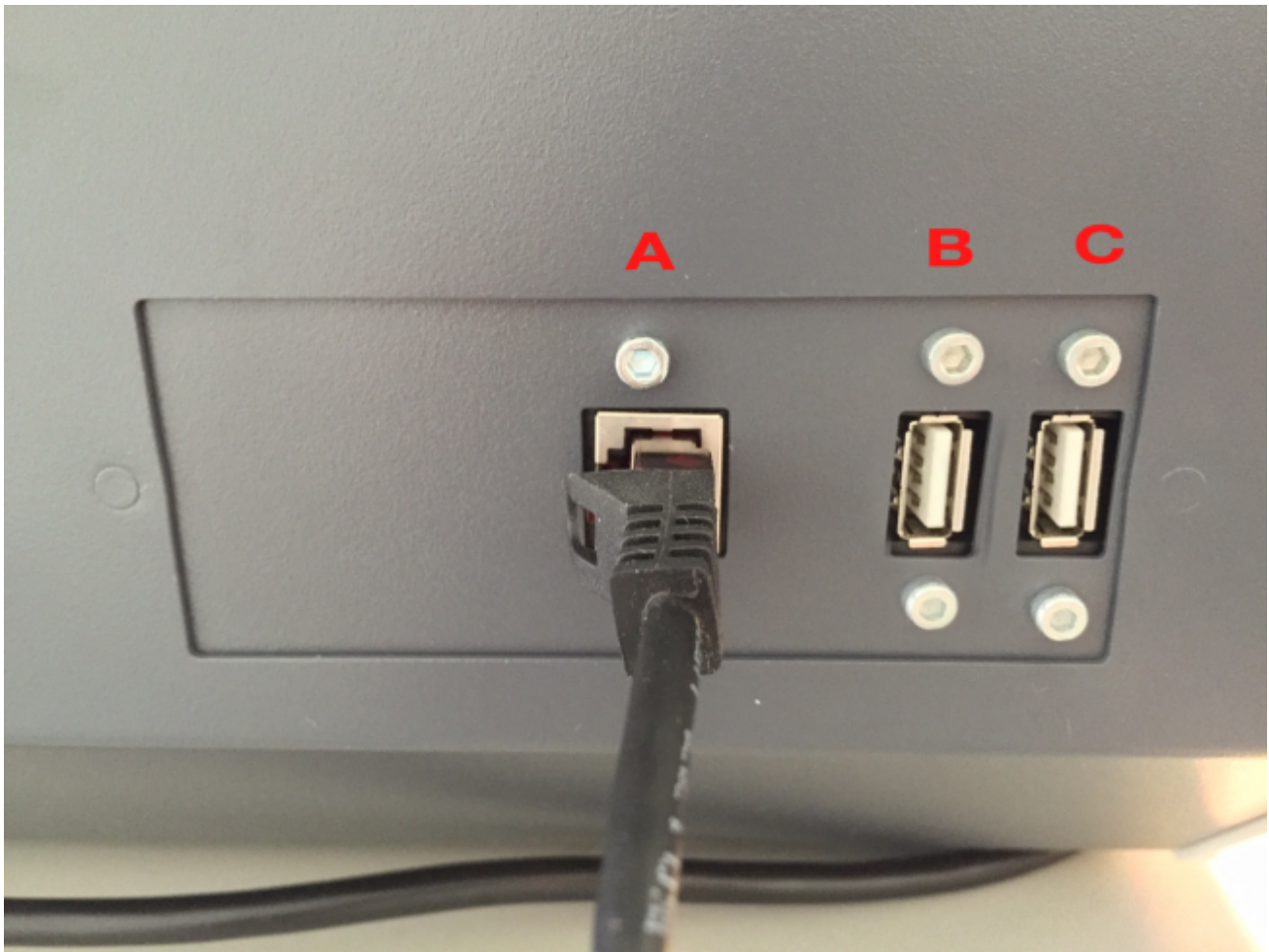
Data ports
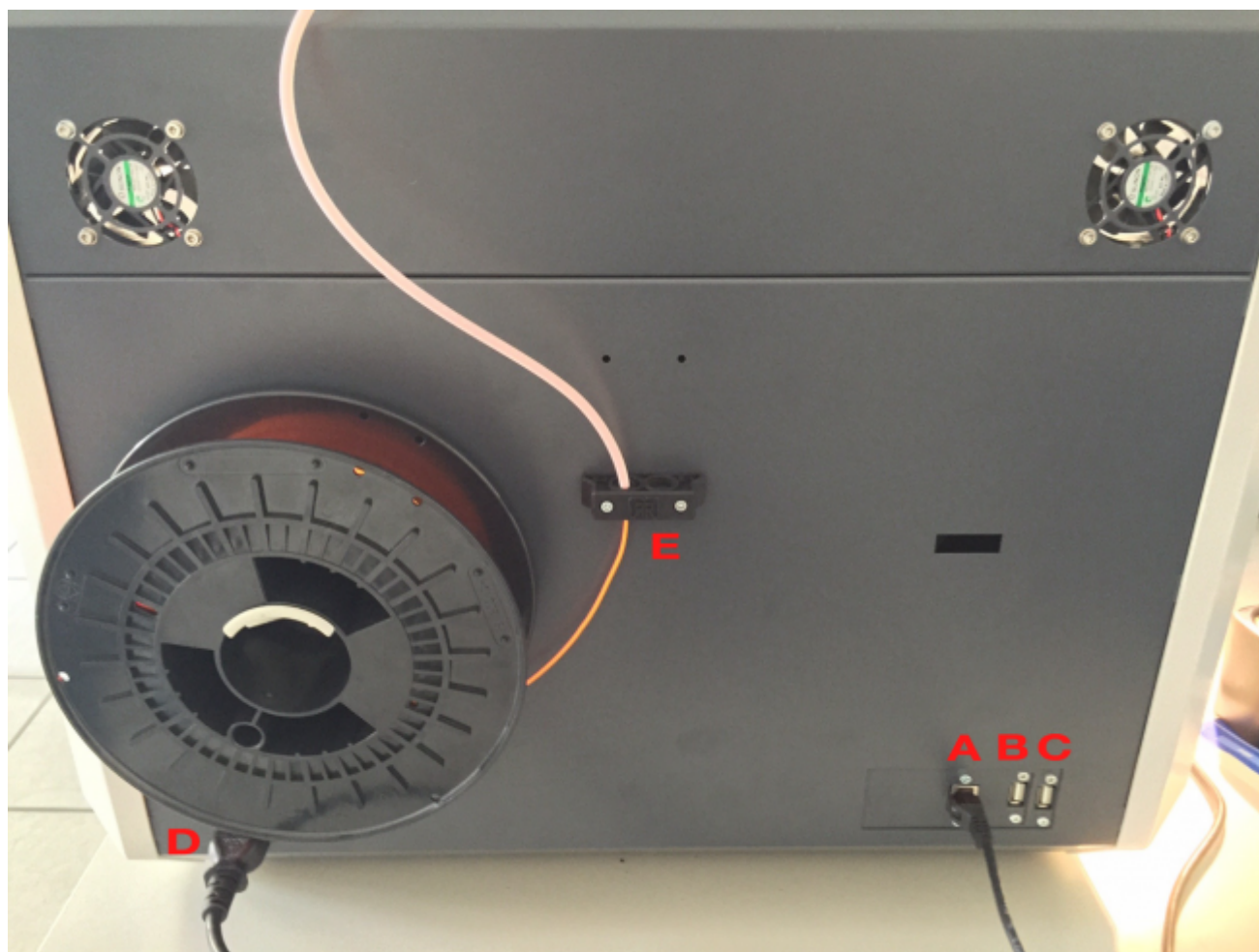
Ports on the rear

- **A** - Network port
- **B** - USB port for internal [3DPrintBox V2 manual](#)
- **C** - USB port for internal [3DPrintBox V2 manual](#)
- **D** - 230V connector
- **E** - Filament feed

The USB ports for [3DPrintBox V2 manual](#) may be used to attach USB webcams or similar devices with later software versions. These will then be available in the operating system of the [3DPrintBox V2 manual](#).

Levelling the printing bed

In order to level the printing bed, the following steps are necessary.

- Heat up the printing bed to room temperature
- Set the z-axis to its home-position using the control panel: Press the button →"Position" → "Home Z"
- Wait at least 10-15 minutes to let the printer acclimatise
- If necessary, turn off the holding torque of the motors using the control panel: Press the button → "Quick Settings" → "Turn off motors"

- Now move the printing head close to each holding point above the adjusting screws, and fasten or loosen the knurled nut a bit until only one sheet of paper (80g/sqm, copy paper) would fit between the nozzle tip and the printing bed.
- Also check other randomly chosen positions for the printing head
- Repeat until the distance is identical in any position.
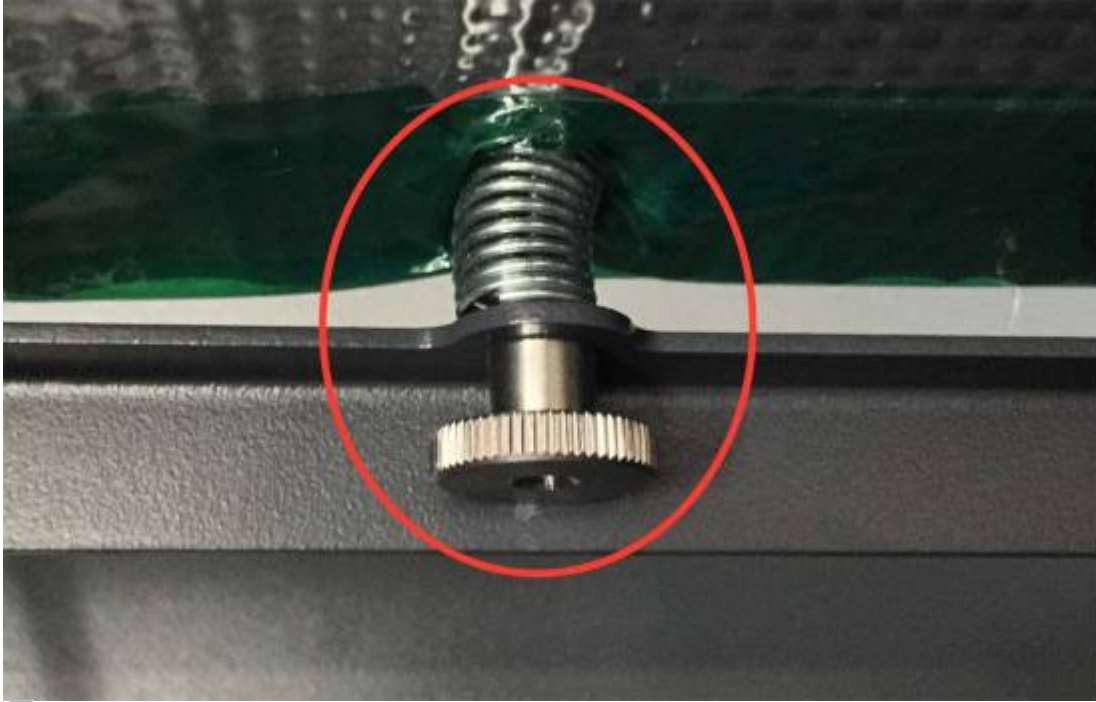
Printing bed adjusting screws

Re-level the printing bed if you set the temperature of the printing bed to an entirely different value. This is the case, for example, when switching from PLA (Polylactic acid) to ABS (Acrylonitrile butadiene styrene-copolymer) or vice versa.

Stripping container, setup and removal

Adjust the distance of the perforated plate so that the nozzle has a distance of about 1mm to the plate. Use the knurled nut to adjust the height.
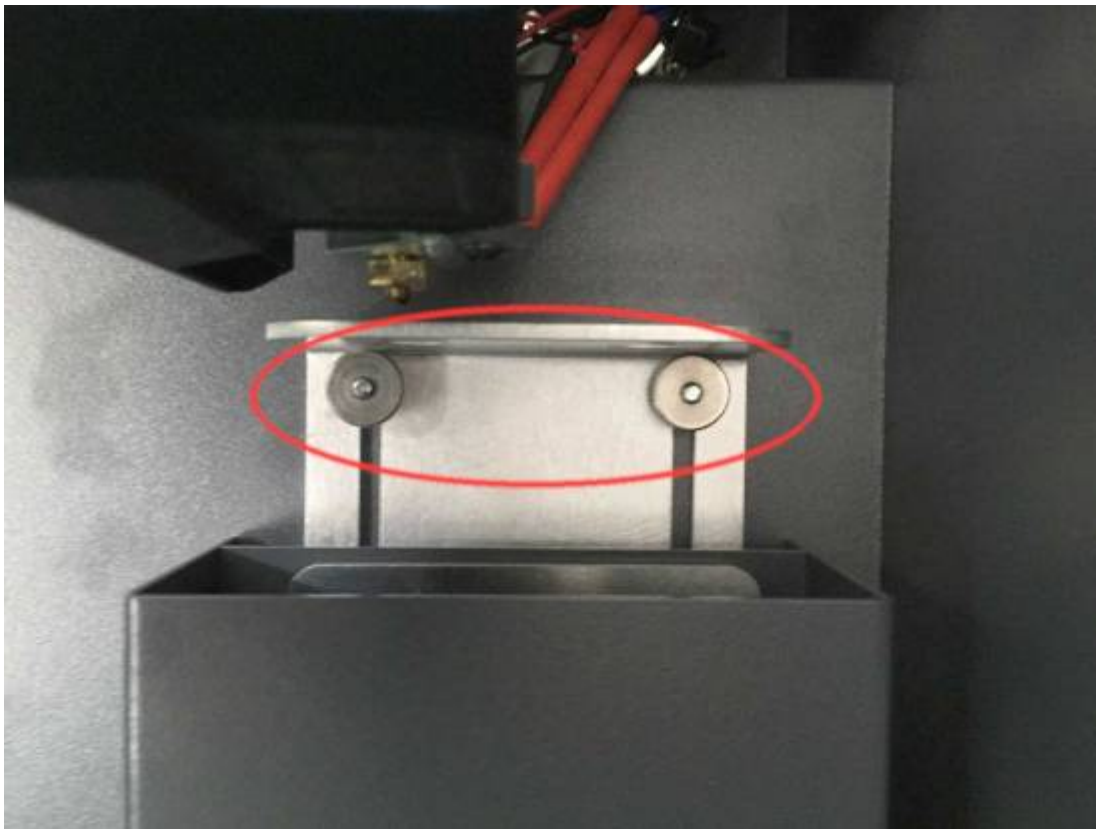
Waste container

Case fan control

Both of the case fans that are installed in the upper printer can be controlled through Gcode:

- **M806 S<220-255>** - Turn on fan, whereby 220 = 86% fan speed, 255 = 100% fan speed
- **M807** - Turn off fan

Changes with Firmwareversion 3.1:

- **M106 P1 S<220-255>** - Turn on fan, whereby 220 = 86% fan speed, 255 = 100% fan speed
- **M107 P1** - Turn off fan

The fan will only reliably start spinning at a set fan speed of 86%.

If the printing bed temperature is at 60 degrees (PLA) and the fan speed is at 100%, the temperature in the printing space will be 30 degrees. If the printing bed temperature is at 110 degrees (ABS) and the fan speed is at 100%, the temperature in the printing space will be 55 degrees.

Network setup

The X350 printer contains a [3DPrintBox](). The manual for the [3DPrintBox]() includes all information about the network setup and software updates. Please ignore instructions about the connection to the 3DPrintBox, as it is already installed and integrated.

http://wiki.germanreprap.com/en/handbuch/3dprintbox_v2

Inserting filament

Please do NOT let the extruder remain at temperature for a longer time if you are not using it. This may lead to so-called "linking" of plastics and can clog your extruder, which is very hard to clean out. This effect is most often observed when using [PLA (Polylactic acid)]().

The coil with the printing material is hanged in the coil holder in the back, and the end of the wire is cleanly cut with a wire cutter. Then the wire is lead through the filament conduct and pushed forwards to the extruder.
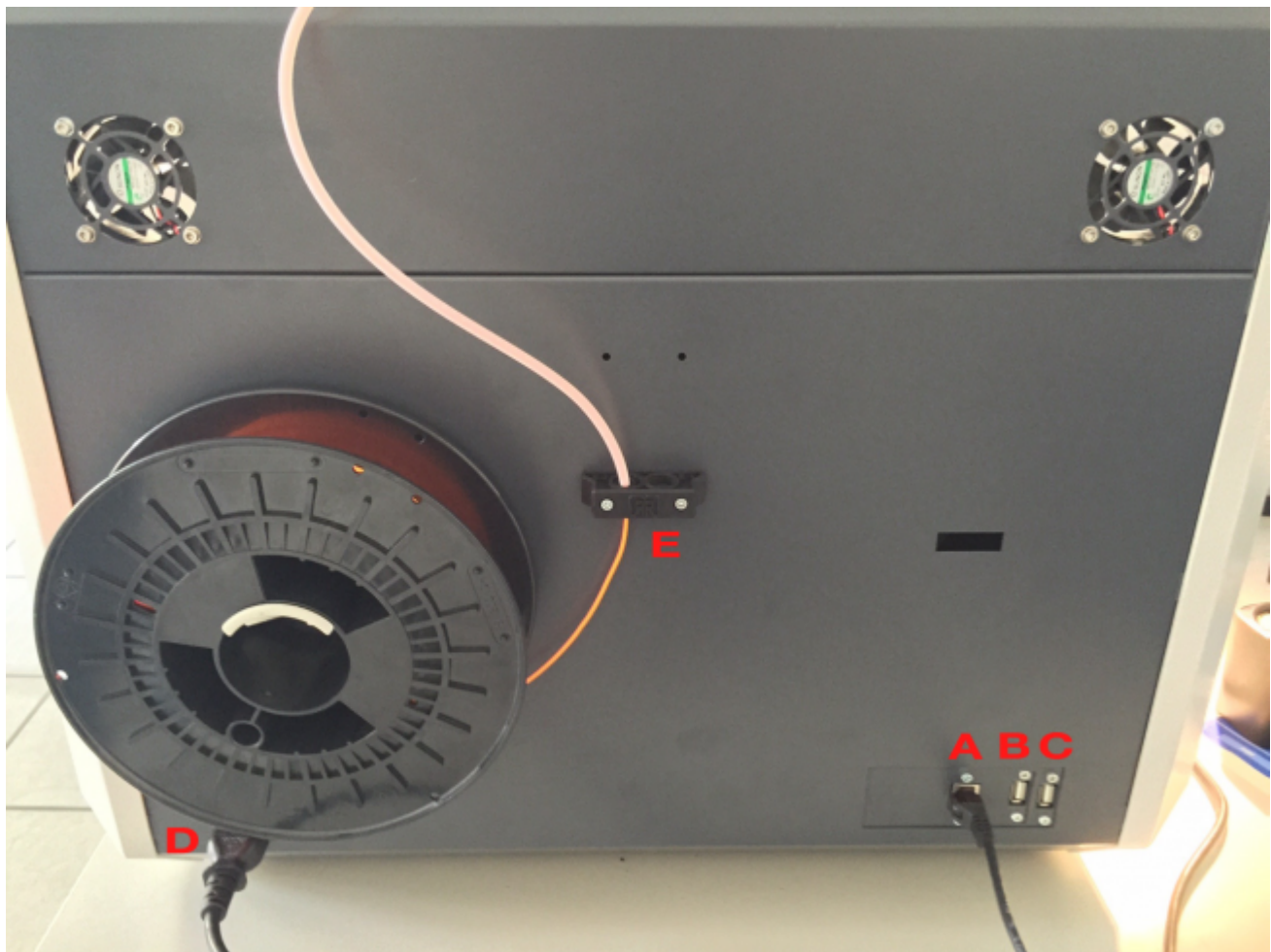
E - Filament insertion

Directly at the device

In order to lead the filament into the extruder, take the following steps:

- Heat up the extruder manually using the control panel: Press the button → "Extruder" → "Temp.1"
- Wait until the Extruder has reached the target temperature
- In the menu, select: "Position" → "Extr. Position"
- After activating the menu point, turn the control wheel <u>clockwise</u> in order to pull in or lead the filament, and <u>counter-clockwise</u> to eject the filament

- When you are done, please turn off the extruder heating
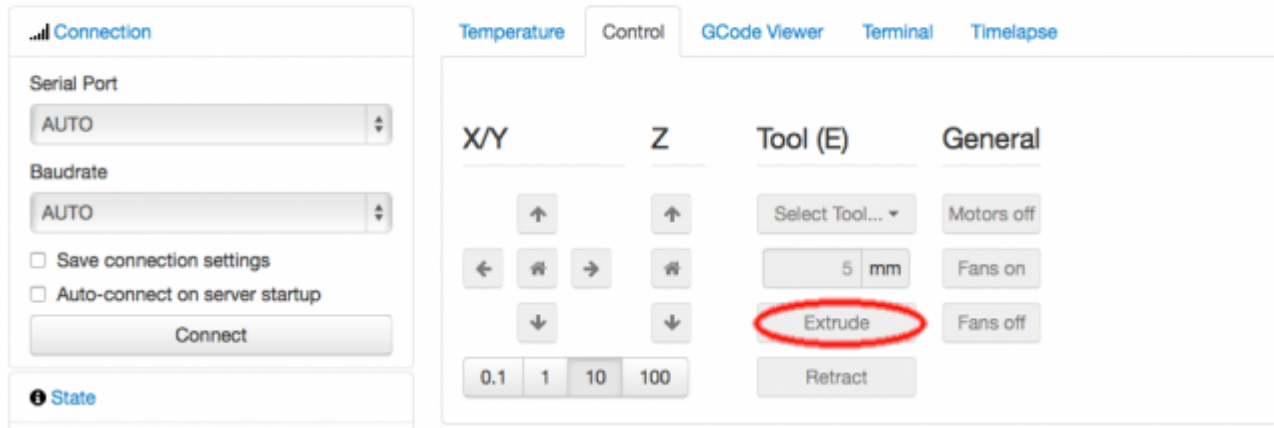
Through the network

Heat up the Hot-End through the web interface. Once the target temperature is reached, you can lead the inserted filament via the web interface manually, until it exits the nozzle. Afterwards, turn off the extruder heating.

If the extruder doesn't properly lead the filament, you can adjust the contact pressure on the filament using the adjusting wheel at the extruder. Depending on the material it may be necessary to adjust the contact pressure to the material in order to achieve a flawless leading of the filament. To do that, turn the adjusting wheel at the extruder.

Adjusting wheel
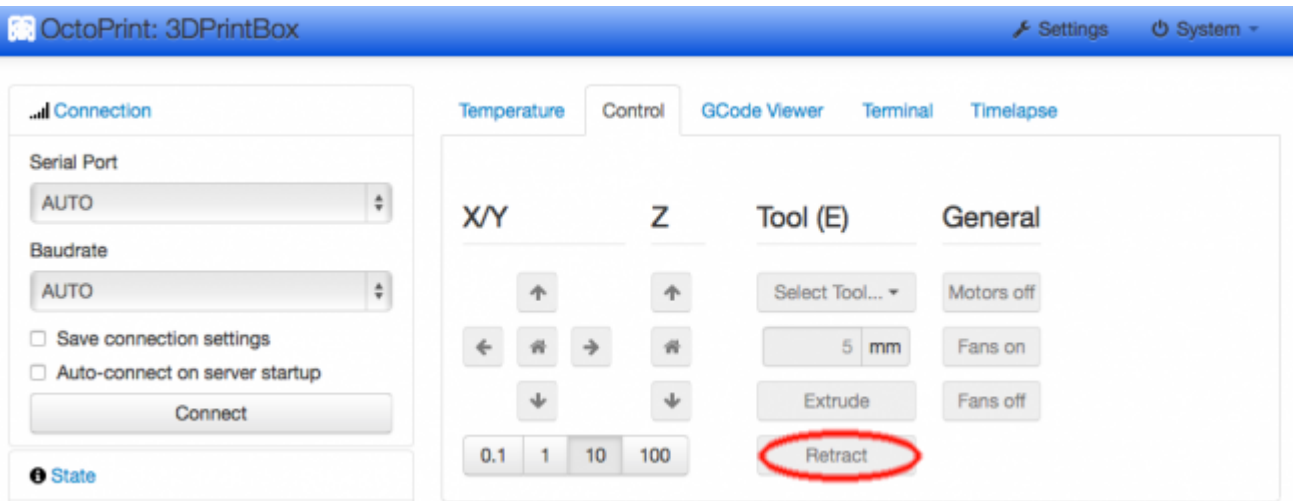
Manual extrusion

Removing the filament

In order to "unload" the filament, take the steps in reverse. Heat up the extruder until it reaches the target temperature, and let it spin backwards until you can pull the wire out of the filament lead by hand. Afterwards, turn of the extruder heating.

Manual retract

Changing the filament

The filament change is in principle done the same way as loading or unloading the wire. However, you have to adjust the temperature of the extruder to the "higher grade" material. For example, if you change PLA to ABS, you need a temperature of 250°C. Once you inserted the new material, extrude it by hand until there are no remains of the previous material coming out of the nozzle anymore. Afterwards, turn the extruder heating off.

Software installation

The X350 3D-Printer comes with a license of the software Simplify3D™ You can download the correct version for your operating system under https://www.simplify3d.com/downloads/ after entering the license key. Launch the installation in accordance with the installation instructions you find there.

As the X350 has NO direct interface for USB-PC connection, instructions about printing via USB in the following section are not applicable. The generated Gcode is exported from Simplify3D™ as a file, and then fed to the printer via SD-card or via the network.

An instruction on Simplify3D™ can be found here:
http://wiki.germanreprap.com/en/software/simplify3d

Printing with SD card

Other than the option to load Gcode files on the printer through the network, there is also the possibility to save the Gcode from Simplify3D on an SD-card (FAT32 format, max. 4GB).

This SD card can then be inserted into the card reader in the front of the printer. Usually the printer will then display the content of the SD-card. You can then select the correct file and start the printer with pressing the button.

SD-Card slot

If the content of the SD-card is not displayed after inserting it into the card reader, the file may also be selected through the menu on the LCD display: Press the button →"SD-Card" → "Print file" → Select file.

Removing the printed object

In order to remove a printed object upon completion, take the following steps:

- Let the printing bed cool down
- Carefully check if the piece can be removed easily by hand
- If it sticks too strongly, use the included spatula to carefully loosen the object from the printing bed

Cleaning the printing head (extruder)

After some time the nozzle and the heating block of the Hot-End may get dirty. In order to clean it, take the following steps:

- Put the printing head into an easily reachable and comfortable position
- Heat up the Hot-End to the temperature of the respective used material
- Clean the nozzle and the heating block from below with the included brass brush

Material selection

The temperatures listed here are based on our printers and should be treated as a recommendation only. Please tweak them to your own needs as required.

3D printers need materials to create object from like "common" printers. Depending on the printers technology you are able to use different types of materials.

Thermoplastic, also known as a thermosoftening plastic, is a polymer that turns to a liquid when heated and freezes to a very glassy state when cooled sufficiently. Thermoplastic polymers differ from thermosetting polymers (Bakelite) in that they can be remelted and remoulded. Many thermoplastic materials are addition polymers; e.g., vinyl chain-growth polymers such as polyethylene and polypropylene.

Filament type	Melting point (°C)[1]	Extruder (°C)[2]	Printbed (°C)[3]	Surface[4]	Stable (°C)[5]
ABS	220°	~230° - 255°	~ 110° - 115°	Carbon/PET/Kapton	~ 140°
PLA - Polyactose	200°	~180° - 220°	~ 55° - 65°	Carbon/PET/Kapton/Glas	~ 60°
PS - Polystyrol	210°	~190° - 220°	~ 80° - 100°	Carbon/PET/Kapton	–

Filament type	Melting point (°C)[1]	Extruder (°C)[2]	Printbed (°C)[3]	Surface[4]	Stable (°C)[5]
PVA - Polyvinylalkohol[6]	210°	~190° - 220°	~ 55° - 115°	Carbon/PET/Kapton	–
LAYWOOD - Holz	210°	~180° - 230°	~ 0° - 80°	Carbon/PET/Kapton	~ 60°
LAYBRICK - Stein	160°	~165° - 210°	~ 0° - 80°	Carbon/PET/Kapton	~ 70°
PP	210°	~210°	~ 0° - 80°	PP	~ 150°
PA6[7]	240°	~245° - 265°	~ 130°	Kapton	–
TPU93[8]	190°C	~190°C-215°C	cold	Glas	> 120°C
Carbon20[9]	235°C	~252°C	~45°C	PET	–

Download datasheets

ABS datasheet (en)

Smart ABS datasheet (en)

Bendlay datasheet (en)

Carbon datasheet (en)

HiPS datasheet (de)

Laybrick datasheet (en)

Laywood datasheet (en)

PA6 Datenblatt (en)

PLA datasheet (en)

PLA soft datasheet (en)

PP datasheet (en)

PS datasheet (en)

PVA datasheet (de)

PVA datasheet (en)

TPU93 datasheet (en)

TPU93 datasheet (de)

Materialinfo

ABS (Acrylonitrile butadiene styrene-copolymer)
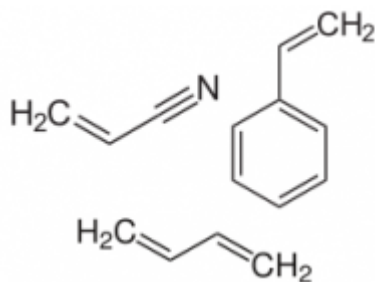
Acrylonitrile butadiene
styrene-copolymer (ABS)

Acrylonitrile butadiene styrene-copolymer (*short ABS*) is a synthetic terpolymer of three different kinds of monomers, acrylonitrile, 1.3 butadiene and styrene and belongs to the amorphous thermoplastics. The proportions can vary from 15 to 35% acrylonitrile, 5 to 30% butadiene and 40 to 60%.

Specification

The following specification refers to the ABS distributed by us.

- **Density:** 1,05 g/cm3
- **Melt mass flow rate MFR:** 5-9 (220 °C/10 kg), g/1 0 min
- **Melt volume rate MVR:** 5-9 (220 °C/10 kg), cm 3/10 min
- **Tensile strength:** 2400 MPa (23°C)
- **Impact strentgth:** 130 (bei 23°C), 100 (bei – 30 °C) kJ/ m2
- **Notched bar impact test Izod:** 25 (bei 23°C), 12 (bei -30° C) kJ/m2
- **VIcat- softening temperature:** ~ 100 °C
- **Melting temperature:** from ~ 220 °C

Source

W[Acrylonitrile butadiene styrene](#)

PLA (Polylactic acid)
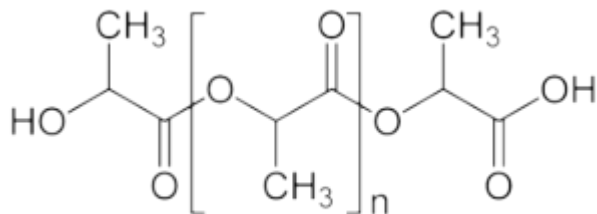
PLA (Polylactic acid)

Polylactic acid or polylactide (*short PLA*) are plastics, malleable by heat supply (also called thermoplastics). They are made of many chemically bound lactic acid molecules, so they belong to the polymers. Polylactide plastics are biocompatible.

Specification

The following specification refers to the PLA distributed by us.

- **Density:** 1,24 g/cm3
- **Melt mass flow rate MFR:** n/a (220 °C/10 kg), g/10 min
- **Melt volume rate MVR:** n/a (220 °C/10 kg), cm 3/10 min
- **Tensile strength:** n/a MPa (23°C)
- **Impact strentgth:** n/a kJ/ m2
- **Notched bar impact test Izod:** n/a kJ/m2
- **VIcat- softening temperature:** n/a* °C
- **Melting temperature:** from ~ 180 °C

Source

W [Polylactic acid](#)

Troubleshooting

Problem	Solution
Device doesn't turn on	Check the power supply
Hot-End doesn't heat up	Check if the Hot-End plug connection is firm enough, and if needed, contact our support at support@germanreprap.com
Printing bed doesn't heat up	Contact our support at support@germanreprap.com
Printer stops printing mid-process	Please check the following things: Power supply, SD card may be faulty, Gcode may be invalid, otherwise contact our support at support@germanreprap.com

Problem	Solution
There is no material coming out of the nozzle, or the material flow is inconsistent	Rectify contact pressure at the extruder, clean Hot-End, check filament feed
The printed object comes loose from the printing bed	Clean the printing bed, if necessary lubricate it with acetone (NOT if you have a BuildTak overlay), printing overlay may be worn out (PET film), distance between nozzle and printing board may be wrong

Support

We provide support and all the documentation.

Documentation

You'll find all the documentation online at http://wiki.germanreprap.com . Please register with the site at wiki.germanreprap.com in order to be able to automatically send notifications and changes of documents you are interested in via email.

Telephone

Our hotline is staffed from Monday to Friday (excluding public holidays) between 10:30 - 16:00 and can be reached at +49 9001 RepRap (+49 9001 737727) [10]. We answer your technical questions and provide consulting for more complex setups.

0.99 € per minute from a landline in Germany, prices may vary depending on your landline telephone, VOIP or mobile phone provider

Support tickets / E-mail

Please use our support pages at https://support.germanreprap.com to lodge a new ticket and check the status of an old one, all free of charge.

Alternatively you can send an email to support@germanreprap.com which generates a ticket, also free of charge.

Forum (Community)

At https://forum.germanreprap.com you can interact with our 3D printing community in different languages and exchange tips and tricks.

Important notes

Return / Original wrapping

Please retain this documentation and the original package of this printer in case you need to ship it for repairs or to a new address. 3D printers are inherently sensitive to bumping or knocking and are best protected in their original box. Returns that are not properly packaged cannot be repaired under warranty.

Operation

Do not cut the power while the printer is active. This can lead to the loss of data as well as damage some electronic components.

Other matters

All information in this guide is current at the time of printing. We reserve the right to amend the hardware, software or the documentation without prior notice. The latest information will always be available at http://www.germanreprap.com.

Toxic fumes

Depending on the plastic being used there is a danger of toxic fumes developing if the printer is running too hot for that filament. Always make sure to set the correct temperature for the plastic used. The maximum temperature is generally printed on the filament spool and can also be looked up on our website. (http://www.germanreprap.com).

Safety cut-off

The device has a thermal protection mechanism built-in. If the temperature exceeds the safe working limit the printer turn itself off after issuing a warning message.

Maintenance

Every 12 months the printer has to be serviced by trained personnel. This includes checking the safety devices as well as all mechanical components. German RepRap offers this as a service. Please contact us via info@germanreprap.com for more details.

Work on a mains power supply should only be carried out by trained specialists. It is essential to note the safety regulations. Property or personal damage may be caused by improper installation, which the installer bears liability for.

Proper handling of the chemicals necessary for maintenance and care is obligatory, as well as complying with the regulations and operation notes regarding the chemicals. Directions of the manufacturer must be followed at all times and appropriate protective clothing has to be worn. Property or personal damage may be caused by improper use of the chemicals, which the operator alone bears liability for.

Safety notes

Power supply

Always ensure that the power lead has not been damaged. Disconnect the device immediately if the power lead shows any sign of damage. Have the power supply inspected by an authorised electrician. Only use the power supply that came with the printer. An electric shock from a faulty power lead can be fatal!

Only use the power supply if your mains voltage is 100-110V or 220-240V AC. Only use the correct power lead for your mains socket.

Cleaning

Pull the power plug before cleaning the device. Use a dry cloth and only clean the surface.

Handling the chemicals necessary for maintenance and servicing has to take place properly and under adherence to of for this valid regulations and application notes to the chemicals. To the specifications of the manufacturers absolutely for this is to be responded, it is appropriate protective clothing to be carried, and the dosage regulations are to be kept exactly.Special and personal injury can be caused by inappropriate handling chemicals, for which alone the operator is responsible.

Playing children

Touching the internal parts of the power supply can cause an electric shock!

Mains voltage

Only operate the device with the indicated supply voltage (visible on the backside of the device or on the external power supply) The device must not be connected to the mains until all connections were double checked.

There is a fire hazard if the mains voltage is too high!

Humidity, solar radiation, heat, open fire

Protect the device from extreme humidity, dripping and splash water (do not place any liquid-filled containers such as beverages on it). Do not place the device near a heater, do not expose it to extended direct sunlight and do not operate it in damp rooms. Only use the device in a moderate, not a tropical climate. Do not put any open flames such as candles on the device!

Ventilation

The heat arising in the device is sufficiently discharged. Nevertheless do not install the device in a closet or in a shelf with insufficient ventilation. Never cover the ventilation slots of the device, if there are any.

Do not place any object on the device. To allow heat to dissipate, please allow at least 30cm above, 20cm to each side and 30cm behind the device unobstructed.

The device only complies the declaration of conformity if the transparent case is assembled and the door closed while operating.

Long absence, thunderstorms, accessibility of the power plug

To completely disconnect the device from mains power just pull the power plug out of the mains socket. Make sure this socket is accessible. In case of longer absence and possible thunderstorms, switch off the device with the power switch and then disconnect it from the mains. This also applies for USB appliances connected to the device.

Installation site

Every electronic device develops heat. The heating of the device is within the permitted range though. Sensitive surfaces may discolor over time due to heat exposure. Moreover, the rubber feet of the device may cause color changes on furniture surfaces. If applicable, please place the device on a solid, appropriate and plane base!

Please mind the practicability when choosing the installation site (sufficient working height).

Disposal

Electronic equipment may not be disposed in the domestic waste - in accordance with Directive 2002/96/EG of the European Parliament and the Council of 27th of January 2003 about electric and electronic equipment it has to be professionally disposed. At the end of its use please dispose this device at one of the public collection point intended for this.

Rechtliche Hinweise

Software-Changes / Use of applications

Modifications to the software or using software not supplied by German RepRap GmbH void the warranty of the device. Shipping costs as well as costs for repairs caused by using unsupported software are billed to the customer.

Only use the software packages provided by German RepRap GmbH through their website as well as the original CD-ROM that came with the device.

German RepRap GmbH cannot be held liable for the loss of data on any internal or external storage medium.

The device has been pre-installed with software and works as can be reasonably expected. It cannot be guaranteed that the software is error-free. As long as it is possible to use the printer as designed an error in the software does not constitute a faulty device and hence provides no grounds to a warranty claim. The warranty only covers faults in the software that would prevent the normal use of the printer.

Limitations of the software caused by hardware faults, the environment the printer is being used in, operating error or similar reasons are not considered software faults.

Contact

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Links

[X350 Flyer](#)

[Download CE Konformitätserklärung](#)

[Simplify3D™](#)

[1] manufacturer's information

[2] , [3] , [5] our recommendation

[4] cover of printbed

[6] material is hygroscopic and therefore limited storable

[7] material is hygroscopic and therefore limited storable, in case of bubbles during pint it can be dried in an oven at about 80°C for ca. 3-4 hours

[8] Material kann nur mit dem DD3 Extruder verarbeitet werden!

[9] Sollte dauerhaft nur mit einer Edelstahldüse verarbeitet werden, da extrem abrasiv

[10] 0.99€/minute from a landline in Germany, prices may vary depending on your landline telephone, VOIP or mobile phone provider

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