

# Knowledge Base

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<https://support.zortrax.com/knowledge-base-m200plus/>

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# Useful Terms

Here's a short overview of technical terms which are most commonly used in the whole Zortrax experience. If you're new to 3D printing technology, the list below organizes and helps to understand all the necessary terms.

## EXTRUDER

the mechanism which ensures material feeding, heating and extruding as well as cooling of the print. Its main components include the hotend and the nozzle. The material is melted in the hotend, and then pushed through it until it exits the nozzle. The melted thermoplastic is deposited layer by layer to form a predesigned shape. Additionally, there are three fans on the extruder: one which cools the whole mechanism and two which cool the print.

## EXTRUDER CABLE

the ribbon cable which connects the extruder with the motherboard. It supplies the extruder with electricity and allows the motherboard to regulate the printing process.

## FIRMWARE

the software programmed into Zortrax printers, which controls and monitor all the data in the device. It also gives the possibility to enable/disable the printer's options.

## HOTEND

an essential heating system which consists of an aluminum block and a heater & thermocouple. The hotend is responsible for heating and melting the material as well as for ensuring the proper temperature of the material during the whole printing process. In addition, the hotend is less likely to become dirty thanks to the teflon cover.

## LPD (LAYER PLASTIC DEPOSITION) / FFF

a technology in which a melted material is deposited on a surface. This technique involves applying one layer of material after another in order to accurately form a computer-designed shape. This technology is used by Zortrax devices – the printer starts to print from the bottom and builds the object until it is fully formed. The model and the support structures are created using the same material.

## MATERIAL ENDSTOP

the device placed at the back of the printer, which detects the presence of material and

reacts when it runs out. If during the printing process a spool of material is finished, the material endstop will automatically make the printer pause the printing and allow the user to load new material.

## MATERIAL GUIDE

the tube which feeds the material from the spool to the extruder at the proper angle. The material guide in the Zortrax M200 Plus has to be attached to the extruder and to the material endstop placed at the back of the printer.

## MATERIALS

specially dedicated Zortrax printing materials which maximize the benefits of 3D printing. These thermoplastic materials are in the form of filaments wound on a spool. Zortrax offers a wide choice of materials, which are available at: [zortrax.com/materials](https://zortrax.com/materials). Each material has different properties and can easily be adapted to a wide range of needs and applications. Moreover, most of the materials can be mechanically or chemically post-processed.

## MODEL LIBRARY

the collection of ready-made models available within Z-SUITE. All models are divided into categories, for instance art & design, education or robotics. You can find many useful and attractive models there that have been uploaded by users of Zortrax printers. Moreover, there is also one category called Zortrax Parts, in which you can find models of parts that are useful when printing with Zortrax printers, for example spool holders or extruder top covers.

## MOTHERBOARD

the most important part of every Zortrax printer, to which all the necessary components are connected. It is the main printed circuit board which makes it possible for other parts of the printer to communicate with each other. The motherboard is placed under the bottom plate, along with the cooling fan and the power supply unit.

## NOZZLE

the final element of the extruder. It is used to direct a flow of material throughout the entire printing process, allowing to form the desired shape of a model. In addition, the nozzle is less likely to become dirty thanks to the teflon cover.

## PLATFORM

an integral part of the 3D printer, on which the model is created. It consists of two parts:

the heatbed and the perforated plate. Both parts are connected together with the use of screws and Pogo pins. The heatbed provides proper platform heating, whereas the perforated plate increases adhesion of the model to the platform surface. The platform can easily be removed or put back in place.

### **PLATFORM CALIBRATION**

a procedure which lowers the risk of issues that may occur during the printing process. It involves checking the distance between the nozzle and the platform, and five points on the platform and tightening/loosening the calibration screws.

### **POST-PROCESSING**

all procedures of mechanical and chemical treatments that improve the final look of the model. Post-processing techniques include: polishing, sanding, smoothing, painting, or gluing two or more parts together.

### **POWER OUTLET AND MAIN SWITCH**

the switch enables turning the printer on and off. Next to the switch, there is a power outlet where you plug the power cable in.

### **RAFT**

the first few layers of material, which begin the whole printing process. These layers are always printed before the main object and have a larger area than that object. Once the printing is done, the raft needs to be removed from the platform together with the rest of the model. The raft enhances the adhesion of the whole print to the platform and reduces the risk of warping.

### **SIDE COVERS**

plastic panels that can easily be attached to the housing of the printer. They have been designed to provide protection from drafts and temperature differences that can occur in the printing room. Constant temperature inside the printing chamber is important for avoiding cracks and warping. The side covers protect the model during the printing process and help it to adhere better to the platform. The set of covers consists of: two side covers, one front cover, magnets, and hinges. The front panel is fixed to the housing with two hinges and closed by hidden magnets, whereas the side panels snap on. We especially recommend using the side covers for large-sized prints and prints made of materials with high or medium shrinkage level, like Z-ABS.

### **SPOOL HOLDER**

the element which is used to secure the spool of material at the back of the printer. The holder consists of two connected parts. It can be opened and closed with the push-to-open/close mechanism.

## **STARTER KIT**

several pieces of equipment that are put together in one set. Apart from the heatbed and the perforated plate, the set contains tools and protective equipment. The Starter Kit is needed to perform maintenance and repair work of your Zortrax printers. Each printer is delivered with equipment including, for example, a set of nozzle keys or safety gloves.

## **STEPPER MOTOR**

a type of electric motor in which the power supply does not cause full rotation of the motor shaft, but instead, a series of steps. There are four stepper motors in each Zortrax printer: two that are responsible for the extruder's motion, one which allows the platform's vertical motion, and one which enables material loading.

## **SUPPORT STRUCTURES**

if your model has any overhanging or protruding parts, they have to be supported with special structures so that they don't fall down. Without these structures, the model may lose its predesigned shape. The support is printed with the same material as the model. Once the printing is done, it is necessary to remove the support carefully by hand or using pliers.

## **TOUCHSCREEN**

the display screen placed at the front of the printer, which enables fast and intuitive navigation through the device's menu. The screen also displays information about the current printing process and other information concerning the printer.

## **Z-AXIS SCREW**

the screw which is responsible for the platform's vertical motion. It is driven by a stepper motor placed under the the bottom plate. The Z-axis screw constitutes an integral part of the platform moving system.

## **ZCODEX**

a file format which contains a model prepared for 3D printing with previously selected print settings, such as layer thickness, infill type, etc. All print settings can be managed in Z-SUITE before generating the .zcodex. The .zcodex format can be transferred to the printer directly from Z-SUITE over Wi-Fi/Ethernet cable or using a USB flash drive. This formats can only be created by processing .stl / .dxf / .obj or .3mf files in Z-SUITE.

## **Z-SUITE**

the application created specifically for Zortrax devices. Z-SUITE prepares a model for 3D printing by generating the file in the .zcodex format. Z-SUITE allows the users to change and adjust the print settings, such as the size of the model, layer thickness, the type of infill, or how many support structures will be generated. Once the .zcodex is generated, the print settings cannot be changed. The last step is to transfer the file to the printer's storage using Wi-Fi, Ethernet cable, or USB flash drive.

# General Questions

## **How does printing with the Zortrax M200 Plus work?**

Everything begins with preparing a model. The work on the model can be started in any program which creates 3D models and generates .stl, .obj, .3mf or .dxf files. These are the standard file formats supported by most 3D modeling software – the model is saved as a set of three-dimensional triangles (triangle mesh).

The next step is to open the .stl file (or other) in Z-SUITE – the program created specifically for Zortrax devices. Z-SUITE prepares the model by slicing it into individual layers and saving it as a .zcodex file. Each layer represents the movement pattern of the extruder and the platform while building the whole object. Z-SUITE also allows you to choose the material type to be used for the model and to adjust the necessary print settings, such as the size of the model, layer thickness, the type of infill or how many support structures should be generated. The file is then ready to be printed.

Also, it is possible to use ready-made models from the Zortrax Model Library available within Z-SUITE. The Library offers a collection of models that have been uploaded by users of Zortrax printers. The collection is divided into many categories, such as art&design, education, or robotics. There is also one category called Zortrax Parts, in which you can find models of parts that are useful when using Zortrax printers, for example, extruder top covers.

To start the printing process, turn on the printer, prepare and load the material which corresponds with the one you have chosen in Z-SUITE. The full material offer is available at: [zortrax.com](http://zortrax.com).

While working with the Zortrax M200 Plus, you can start, stop and pause the printing process in Z-SUITE. Once your file is prepared, you can transfer it from Z-SUITE to the printer's storage in two ways. You can either save the file on a USB flash drive and plug it into the port at the front of the printer or transfer the file from Z-SUITE over Wi-Fi/Ethernet cable. In addition, Z-SUITE allows you to add several printers to the program's panel and create a network of devices. This solution makes it possible to start small series manufacturing processes and manage them from the screen of your computer. Each printer can still be operated using the touchscreen at the front.

## **What changes have been introduced in the M200 Plus comparing with the standard M200?**

Zortrax M200 Plus is equipped with a number of hardware and software improvements comparing with the standard M200. First of all, the M200 Plus has a touchscreen and a Wi-Fi module, which enable fast and intuitive operation of the device as well as wireless transfer of files for 3D printing. Also, the printer has a material endstop, which pauses

the printing process once the material runs out, and, as a result, lowers the number of failed prints. Other improvements include: the new hotend (v3), which has been designed for faster heating and adopted to print with Z-SEMIFLEX, no small connector on the perforated plate (communication between the heatbed and the perforated plate is provided by the Pogo Pins), an upgraded cooling system of the extruder and prints (additional extruder fan), which significantly improves the printing quality, and a camera which makes it possible to monitor the printing process in Z-SUITE.

### **How does the Support Center work?**

[Support Center](#) is a part of [zortrax.com](http://zortrax.com) website. It is a platform where you can find various manuals and tips&tricks articles. If you have a technical problem, just browse through the categories of: [Repair it yourself](#) or [Printing/material issues](#) to find the appropriate instructions. There are also guidelines and [maintenance work](#) tips that you should follow while keeping your printer in good condition. You can also use *tags* to search for solutions for hardware and software issues.

If you cannot find the solution to your problem, or need more help while repairing your device, fill out [the support form](#) available within the Support Center. Once you report the issue in detail, our specialists will diagnose the problem and provide you with the best solution. Our team will be able to make the diagnosis faster once you attach a photo or a short video showing the problem with your printer. With a detailed description of the issue and a photo/video, the feedback will be more precise – it always includes suggested solutions and, if it is covered by the warranty, you will receive the part that needs to be replaced.

### **What software is necessary to print with the Zortrax M200 Plus?**

The only program that you need to print with Zortrax devices is Z-SUITE. You can download it [here](#). In order to download Z-SUITE, you need to enter the serial number of your device.

### **What electronic equipment do I need to print with the Zortrax M200 Plus?**

All you need to have is a computer with Windows (or Mac OS X), and an SD card.

### **How can I connect my printer to a network?**

Zortrax M200 Plus can be connected to a local network in two ways: via Wi-Fi or using an Ethernet cable. Both methods allow you to manage the printer directly from Z-SUITE and make it possible to transfer the files for printing remotely to the printer.

To connect the printer to a Wi-Fi network, open the Settings menu and select Wi-Fi. From the list of available networks, choose your network and if it's required, enter the password. The connection will be established automatically.

To connect the printer with an Ethernet cable, create a local network and connect the

router/modem/switch to the printer. The connection will be established automatically. You can control the Ethernet connection settings in the main menu; select Settings and Ethernet.

### **Do I have to connect my printer to the Internet?**

No. However, connecting your printer to the Internet will give you the ability to download the latest firmware update automatically and make the whole process of updating easier. If you have decided not to connect your printer to the Internet and still want to transfer the files for printing wirelessly, create a local network that will connect your computer and printer with each other. This solution will make it possible for you to send files from Z-SUITE directly to the printer.

### **How can I update the firmware in my device?**

If your printer is connected to the Internet using either Wi-Fi or an Ethernet cable, it automatically checks for available firmware updates. Once you get a notification informing that the firmware can be updated, follow the instructions displayed on the screen.

If you have decided not to connect the printer to the Internet, check [support.zortrax.com/downloads](http://support.zortrax.com/downloads) regularly for updates. To update the firmware, transfer the Update.zar file to a USB flash drive and plug it into the port at the front of the device. To start the installation, select Refresh.

### **What are the technical specifications of the Zortrax M200 Plus?**

All technical specifications are available [here](#).

### **How much time is needed to print a model?**

It all depends on several factors. First of all, the size and shape of the model strongly influence the time of a particular print job. Secondly, the printing time can be extended or shortened by changing the print settings in Z-SUITE, for example, smaller layer thickness or maximum infill will make the printing process longer. All print parameters are entirely controlled by the user in Z-SUITE.

### **Is it possible to print more than one model at the same time?**

Yes, it is possible to print more than one model simultaneously. Simply add several models to the workspace in Z-SUITE and arrange them with appropriate distance between them.

### **What are the best conditions for 3D printing?**

First of all, place the printer on a flat and stable surface. Always provide adequate conditions: avoid drafts and ensure appropriate temperature (between 21 and 28 °C / 70 – 82 °F) in the print room.

### **It is possible to manage the printing process wirelessly?**

Yes. Once your printer is connected to the network, open the My Devices panel in Z-SUITE. You can search for devices available in the local network and add them to the program's panel. Select the icon with your printer's IP address and click on it to add the printer to the panel. You can also add a printer manually by typing its IP address. Each added printer can easily be managed in Z-SUITE. You can start, stop, and pause the printing process, see the printer's current state (Ready to Print / Printing / Paused / Offline), change the name of your printer, preview basic information about the printer, or display the preview from the printer's camera.

In the 3D Printer Files tab, you can preview all .zcodex files that are stored on the printer's USB flash drive.

### **What materials can be used with the Zortrax M200 Plus?**

Zortrax offers a wide range of specially dedicated materials, which are available at: [here](#). In order to obtain the best quality of models, we advise you to print with Zortrax certified materials, however, it is possible to print with third-party materials.

### **Where can I find the TDSs and SDSs for Zortrax materials?**

[Here](#) you can find all the necessary information on Zortrax materials. Just click on the material of your choice to learn more about it. You can also download Technical Data Sheets and Safety Data Sheets for each material available in our offer.

### **How much maintenance work is required while using the Zortrax M200 Plus?**

[Maintenance work](#) should be regular in order to keep the printer in good condition and achieve high quality prints every time. Some parts require maintenance before each print and some every few hundred working hours. All maintenance activities do not take much time and are not complicated. Each printer is delivered with a full set of tools needed to carry out maintenance work. While working with Zortrax M Series printers, follow the rules included in maintenance guides for each model: [M200](#) and [M300](#).

### **Where can I find the Warranty Card for the Zortrax M200 Plus? What are the main warranty terms?**

The Warranty Card is available at the [Support Center](#). Read it thoroughly to learn the details connected with the Warranty.

The Warranty applies to all Zortrax M200 Plus 3D printers purchased and used within the European Union and in the United States of America. The Warranty period starts on the day of purchase and is valid for twelve (12) months. If your printer has defects and does not operate as intended, the Manufacturer or the Authorized Reseller/Distributor will repair the machine or replace the defective parts. However, the Warranty does not cover any damages resulting from improper use of the printer as well as all consumable parts, such as cables, perforated plate, nozzle, etc. The warranty claim can be submitted via the [Support Form](#). It is important to attach a copy of the proof of purchase and all

materials that will help to identify the device and illustrate the problem.

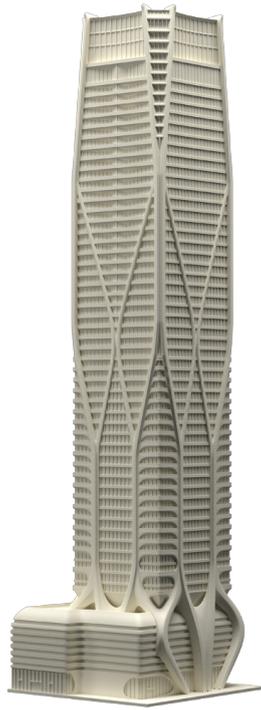
## Models

Whether it's a product to be mass-produced or a gadget to be used at home, **3D printing** is a solution for both. With a high-quality project and materials available in various colors, you can print objects with diverse purposes. A wide range of materials with different properties makes it possible to turn your ideas into shapes that can easily be adapted in many industries – from prototypes of equipment used outside and casing elements to architectural mock-ups and interior design elements.

The Zortrax M200 Plus is compatible with all materials for the standard M200, but in addition, it has been adapted to work with Z-SEMIFLEX. It is a material with unique characteristics, including high elasticity and rubber-like properties. Z-SEMIFLEX exhibits high impact strength, which makes it ideal for prototypes tested in industrial environments, and for models resembling organs used in medical assessment processes.

See the gallery to learn what types of models are achievable with Zortrax 3D printers.







## General Warning Notices

Always read the Zortrax data and information sheets attached to the equipment and articles available online at the [Support Center](#). They are a source of basic information and safety procedures for the equipment you bought. It is essential to update the firmware to avoid any kind of failures. Visit [zortrax.com](http://zortrax.com) regularly to learn about the latest news and updates.

Zortrax M200 Plus 3D printers operate at high temperatures and have easily accessible movable components, therefore, you must be particularly careful when handling or operating the devices. While operating the printer, it is extremely important to avoid situations that may lead to burns or interference in the device's proper functioning. Do not leave the machine unattended during the printing process – check it from time to time for proper functioning in order to avoid potential accidents or breakdowns. Turn off the printer once the print job is finished. Monitor your device for wear and tear regularly. Contact our [Support Center](#) for assistance while replacing worn or broken parts.

Keep the printer away from heat sources, fire, flammable materials, humidity as well as water and other liquids. Place the machine away from any equipment emitting radiation. To prevent any inadvertent use, keep the device out of reach of children and animals. It is forbidden to shake or drop the printer as it may cause breakdowns. The equipment is not intended for use in a potentially explosive environment.

It is strongly recommended to set up a special room dedicated only to 3D printing and ensure proper ventilation in it. At the same time, it is not recommended to stay in a room where devices have been 3D printing for a long time. The vapors released during the printing process do not pose a direct hazard, but they can have negative effects when combined with accumulated dust particles in long-term processes.

Food and beverages should be kept away from both the 3D printers and the 3D printed objects.

More safety instructions are available in the [User Guide](#).