

# 1. Instructions for preparing the workplace and how to safely operate the ZMorph VX machine.

The following precautions should be made to ensure the safety of yourself and your environment and to protect the product from damage. Please follow these precautions at all times:

## Electrical Safety

- Use only the original power supply cable included with machine. Do not damage, cut or repair the power cable. A damaged power cable carries a risk of fire and electric shock even death. Replace a damaged power cable with a manufacturer approved power cable.
- Use the power supply voltage specified on the rating label. Avoid overloading an electrical outlet with multiple devices.
- Power supply should be grounded. If not, it may result in electrical shock, fire, susceptibility to electromagnetic interference and also damage the machine electronic system.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Do not disconnect machine from power supply during any working process.
- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet while moving the machine to other place or during the maintenance process.
- Please do not disassemble the machine since it can void warranty terms. If you experience any problems, please contact your local reseller or ZMorph Customer Support.

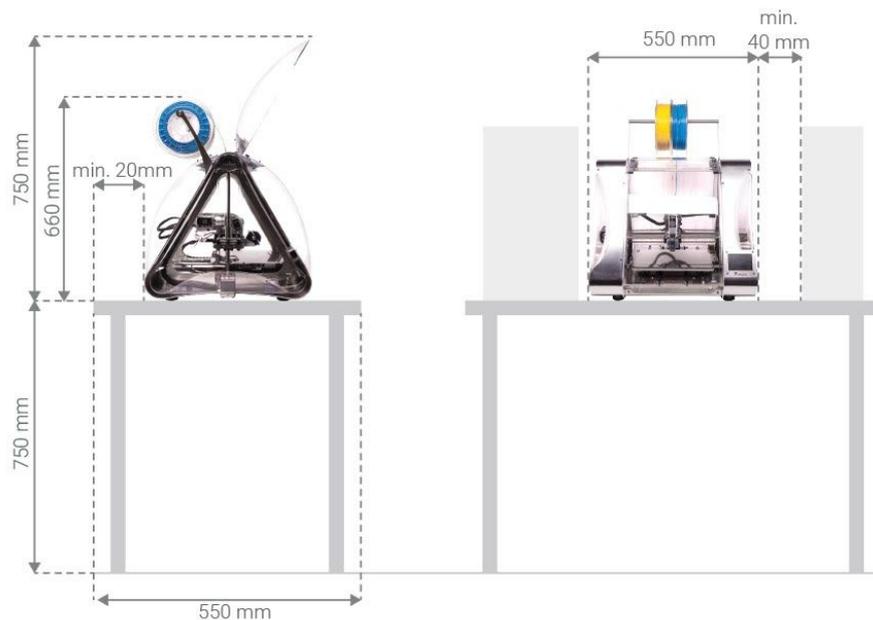
## Operation Safety

- Before using the product, make sure that it is not damaged. Please check the original packaging for any visible holes or imperfections that might indicate bad handling or storage. In case of any damage do not use the product and contact your local reseller or ZMorph Customer Support.
- The machine must be placed on a flat stable surface.
- Before the first usage of the product, ensure all cables are connected correctly and are not damaged, do not connect the power cable to a power outlet that does not match the rating label specifications. In case of any damage do not use the product and contact your local reseller or ZMorph Customer Support.
- The machine is designed to operate indoors at an ambient temperature of between 15°C and 30°C.
- The machine should be used away from any water source and should not be exposed to rain or extreme humidity.
- The machine should be used away from any heat source - flames, fireworks, candles, light bulbs, incense, etc. It might damage the machine.
- When working, the machine may produce high temperatures. The user should not touch any operating parts or elements marked with "hot surface" sticker.
- Due to the fact that some materials might generate toxic fumes the machine should be used in a well-ventilated area.
- All flammable substances and materials should be kept away from the machine, especially during work.
- The person using the machine should always have clean and dry hands.
- If fumes make you feel unwell, switch the machine off, ventilate the room and take a break outside of it.
- The machine requires a full-time supervision when working with following materials and toolheads:
  - Flammable materials for the Laser toolheads,
  - All materials for Thick Paste Extruder.
- ZMorph extruders and toolheads should be used only with materials for which they were designed. Other use is prohibited and will void warranty.
- When the product is operating there are moving parts which can cause injury and heater elements which generate temperatures in the range of 200 - 300°C. Never reach inside the workspace while the machine operates and never touch the printing heads while hot.
- Always allow the machine to cool down completely before reaching inside.
- Touching the extruded material from 3D printing heads may cause burns. Wait for printed objects to cool down before removing them from the build plate.
- Turn off the machine and disconnect it from the power source in any of the following cases:
  - If the machine is making an unusual noise not heard during normal operation,
  - A liquid is spilled on the machine or inside the workspace,
  - During a thunderstorm,
  - During a power failure.

## Safety Guidelines

- Before using the product, carefully read and understand all the manuals that were included with the package. Check for updated versions on our website.
- Follow all safety rules in this section and observe all cautions and warnings in this guide (and those from any additions and materials used in conjunction with the product).
- This machine is not a toy. Adult supervision is required small children and pets should not be allowed to interfere nor operate it.
- Ensure small 3D prints and parts are not accessible to children. They are potential choking hazards.
- Protective glasses should always be worn when removing support material from the 3D printed models.
- The machine must not be covered with other objects and materials during operation.
- 3D printing filaments should be stored in a clean and dry place. The use of dirty filaments might cause the nozzle to clog.
- Do not make any modifications to the product which can affect the mechanics. Doing so is prohibited and may void your warranty and/or affect the safe operation of the product.
- Tie back long hair and loose clothing and keep fingers away from moving parts.
- If you encounter technical problems with the product, contact your local reseller or the ZMorph Customer Support.

## Preparing the workstation.



## Warning signs.

	<b>Caution: Danger from moving parts. To avoid injury or damage to parts of the body, do not reach inside the unit or insert any foreign objects while the unit is in operation, during operation or at rest.</b>
	<b>Caution: Hot Surface Area. Information to prevent injury to yourself when trying to complete a task.</b>
	<b>Caution: Indicates an area which carries the risk of electric shock.</b>

## 2. Instructions for preparing the workplace and how to safely operate the CNC on ZMorph VX.

### Preparing the workstation

- Secure the room with the ZMorph VX machine against any improper usage (the key to the room should be held only by a person authorized to operate the machine),
- Mark the entrance door to a room where a machine with a working CNC toolhead is used with a suitable sign to wear hearing protectors (e.g. headphones, stoppers),
- Depending on the material being processed, the CNC spindle can produce a noise level up to 70dB. Noise is not a risk of hearing damage, but can cause discomfort and stress due to prolonged exposure to a working device,



**Figure 1. Information sign - Hearing protection required.**

- Mark the entrance to the room where a machine with the CNC toolhead is with a proper sign saying that eye protection is required.



**Figure 2. Information sign - Eye protection required, Wear protective goggles.**

- When working with the device with the spindle attached without covers (e.g. if material is larger than the platform), provide personnel and bystanders in the room with safety goggles.
- The electrical installation of the ZMorph VX requires it to be connected to a grounded outlet,
- Place the device on a level and stable surface. The machine is equipped with a vibration-damping base but when working on uneven or sloping surface, vibrations can cause the device to move.
- The room where the ZMorph VX device with the CNC toolhead is located must be well ventilated as vapours may escape from the device during operation,
- If you install a ZMorph VX device with the CNC toolhead in a room where smoke detectors are installed, make sure they do not cause false alarms.

# Health and safety instructions for handling CNC PRO Milling Toolhead.

## General information.

- Use the ZMorph VX device with the CNC toolhead in a separate room which cannot be accessed by children or unauthorized persons,
- Do not put your hands in the workspace after turning on the spindle. The spindle rotates at high speed and has rotating blades that can cause serious injuries,
- Use of the machine by unqualified personnel can lead to injury and/or damage to the machine,
- If you notice any malfunctions of the machine, stop it immediately by pressing the reset button (red ring button on the right on the front panel of the machine) and contact ZMorph Customer Support,
- Do not use a malfunctioning machine under the risk of voiding the warranty,
- Make sure that the material to be machined is firmly attached to the work platform and cannot move in any direction. Failure to follow the instructions may result in injury and/or damage to the machine,
- When using a ZMorph VX machine with the CNC toolhead without covers, both operators and bystanders must always wear safety goggles; failure to do so may result in eye damage.

## Safety at work with CNC

- Do not place your hands in the workspace under any circumstances after starting the spindle. Any exposure of the body to rotating parts of the machine can lead to serious injury. It is therefore essential to use the device safely and in accordance with the instructions,
- The ZMorph VX machine on which the CNC toolhead is mounted and running cannot be left unattended,
- The use and maintenance of the machine must always be carried out in the manner described in the operating instructions,
- Under no circumstances should you open covers that conceal electronic components of the machine when the power supply is connected. If there is a need for repairs or an overhaul of components contact ZMorph Customer Support. For local repairs, the housing may only be removed after the machine has been disconnected from the power supply and the plug has been disconnected from the socket,
- Make sure the room ventilation is working properly,
- The workpieces and tools must be mounted in a stable manner at the correct locations. Avoid collision between the workpiece and the machine. Otherwise, the machine may be damaged,
- Before starting work, check that there are no obstacles in the working area,
- Stop all operations while the workpiece is being changed,
- Do not touch working electrical parts with wet hands.

## Warning signs.

	<p><b>Caution: Danger from moving parts. To avoid injury or damage to parts of the body, do not reach inside the unit or insert any foreign objects while the unit is in operation, during operation or at rest.</b></p>
	<p><b>Caution: High voltage - this symbol indicates the area where the user may be electrocuted.</b></p>

### 3. Instructions for preparing the workplace and how to safely operate the LaserPRO on ZMorph VX.

The LaserPRO supplied with the ZMorph VX machine is a 2.8 Watts class 4 laser with emitted wavelength of 450nm.

These types of lasers are extremely dangerous, they emit visible or invisible radiation and they cause irradiation greater than allowed. Diffuse radiation is dangerous to eyes and skin. Potential hazards are materials evaporated from the surfaces of illuminated objects. Depending on the material used, toxic fumes may affect the user's respiratory tract and eyes.

#### Preparing the workstation

- Avoid using any reflective surface in the room in which the laser is used (eg mirrors, equipment with shiny metal-chromed, nickel-plated, aluminized - or glass parts),
- It is necessary to secure the room in which the ZMorph machine with LaserPRO is located and not working before an unprofessional start-up (the key to the room should only be held by a person authorized to operate the laser),
- It is necessary to mark the entrance door to the room where the device with the attached LaserPRO is used with an appropriate laser radiation warning sign,



Figure 1. Warning sign - Laser radiation.

- It is necessary to mark the entrance door to the room where the device with the attached LaserPRO is used with the appropriate sign to wear protective goggles,



Figure 2. Information sign - Eye protection required, Wear protective goggles.

- Place in a visible place next to the laser workplace a label with the words "visible and invisible laser radiation, protect the eyes and skin from direct or diffuse radiation",
- Provide personnel and bystanders in the room where the laser device works with protective eye shields (glasses, safety goggles) appropriate to the type of laser device.
- The appropriate safety goggles are those which, in a visible place (e.g. on the outside of the frame) have the required markings (e.g. in the form O.D. = 3 for wavelengths of 660 nm or L = 3 for wavelengths of 820 nm). The value of 7 for the O.D. informs that such glasses weaken the power of radiation falling on them 10000000 times. For example, for a 1 W laser with such eyepieces, 0.1 uW of power will reach the eye and it is a radiation level that is completely safe for the human eye,
- Provide personnel and bystanders staying in the room where the laser device works with mouth and nose masks equipped with a filter absorbing smoke particles (FFP3),
- Electrical installation of the ZMorph VX machine requires connecting it to a grounded socket,
- Provide a room in which a working ZMorph machine with LaserPRO is installed in a valid powder extinguisher, it should be located in an accessible place and marked with appropriate markings,
- When installing the ZMorph machine with LaserPRO in a room where smoke detectors are installed, make sure that they do not cause false alarms,
- The room in which the ZMorph machine with the LaserPRO machine is located must be well ventilated, hazardous vapors may escape from the machine.

# Safety instructions for handling LaserPRO on ZMorph VX

## General information.

- The ZMorph VX machine with LaserPRO mounted should be used in a separate room without the possibility of outsiders getting in,
- Regardless of the laser class, it is forbidden to look at the laser beam (i.e. to look into the opening of the laser from which the beam is emitted); this also applies to the reflected beam,
- Using the machine by unqualified personnel may lead to damage to health and / or damage to the machine. ZMorph VX machine and LaserPRO toolhead are not toys and can't be used by children without adult supervision,
- If you notice any abnormalities in the operation of the machine, stop the process immediately with the reset button (red button on the right side on the front panel of the machine) and contact the ZMorph Customer Support,
- Do not use a defective machine under the threat of losing the warranty,
- When using the ZMorph VX machine with LaserPRO, both the staff and the bystanders (if any around) must always wear safety goggles, failing to comply with this recommendation may result in damage or loss of sight,
- Never open any covers under which the machine components are hidden with the power supply connected. If it is necessary to repair or inspect components, please contact the official ZMorph Customer Support,
- Before starting work on the machine with LaserPRO, make sure that the machine's surroundings (work room) is closed and that there is no possibility of unauthorized access without proper eye protection.

## Safety at work with Laser.

- Any exposure to laser emission may cause physical burns or damage to your eyesight. It is extremely important to use the device in a safe manner and in accordance with the instructions,
- The ZMorph VX machine on which the LaserPRO is mounted and working can not be left unattended,
- A fire extinguisher with valid approval should always be located as close as possible to the machine to which the laser is connected,
- The use and maintenance of the machine must always be carried out in a manner consistent with the description in the manual,
- Make sure that the room ventilation works correctly,
- Install the workpieces and tools in the correct places in a safe manner. Avoid colliding the workpiece with the machine. Otherwise, the machine may be damaged,
- Check that there are no obstacles in the work area before starting work,
- During the change of the workpiece, stop all operations,
- Do not touch working electrical parts with wet hands,
- Do not place your hands in the working area during processing.

## Warning signs.

	<p><b>PREVENT EYE EXPOSURE.</b>  <b>Class 4 visible-beam lasers are high-powered. A Class 4 laser can cause a significant eye injury if the beam, whether direct or reflected, enters the eye.</b></p>
	<p><b>AVOID SKIN EXPOSURE.</b>  <b>Avoid exposure to skin and sensitive materials. A Class 4 laser can burn skin and materials, especially dark and/or lightweight materials at close range.</b></p>
	<p><b>Attention! Danger. - General warning sign. W001, according to PN-EN ISO 7010.</b></p>
	<p><b>Laser beam warning. - Warning sign used to warn of danger presented by laser beams. W004, according to PN-EN ISO 7010.</b></p>