

VXL GO

Starter Kit for Support Material Dissolving



Introduction

Please read this manual carefully. It gives you all the necessary information about the operation of the starter kit and helps you avoid potential hazards.



Tip: This symbol shows you important tips.



Caution: This symbol points out specific dangers and safety precautions.

Contents

Introduction	2
Declaration of conformity	4
Product description	6
Specifications	6
Safety instructions and warnings	7
Preparation	9
Accessory Checklist	9
Setup	9
Filling and Operation	10
Operation	11
Controls	11
Recommendations for materials and temperature	12
Insert parts	13
Remove parts	13
Emptying	15
Cleaning and Maintenance	16
Disposal	17
Behavior in the case of failure	18
Additional information	20

Declaration of conformity

Declaration of conformity according to the EC machinery directive (2006/42/EG, app. II 1. A).

The manufacturer,

BellandTechnology AG
Kühlenfelser Straße 47
D-91278 Pottenstein



declares sole responsibility that the machine

Name: VXL GO
Model: 1
Year of manufacture: 2021

complies with all the relevant provisions of the machinery directive 2006/42/EG.

The machine also complies with all provisions of the following directives:

- Directive 2014/30/EU relating to electromagnetic compatibility.
- Directive 2014/35/EU Low Voltage Directive.

The following norms have been applied:

- EN 55014-1:2017: Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission.
- EN 55014-2:2015: Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity.
- EN IEC 61000-3-2:2019: Electromagnetic compatibility – Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).

- EN 61000-3-3: 2013: Electromagnetic compatibility - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.

The following other technical norms and specifications have been applied:

- None.

Head of technical documentation compilation:

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Place, date: Bayreuth 07/07/2021



Signature

Product description

The VXL GO starter kit is designed for automatic removal of 3D printed VXL support material and made especially for home users. For this purpose, the container will be filled with water and heated and stirred by the inserted heating/stirring rod. Through addition of a detergent, the alkali-soluble support structure of the inserted print objects will be dissolved by the movement of the heated washing solution.

Specifications

Rated Voltage/Frequency	230 V AC, 50 Hz, EU plug
Max. power consumption	Ca. 850 W
Max. temperature	60 °C
Filling capacity	10 L
Heating time (25 – 60 °C)	25 min
Max. weight	13 kg
Dimensions (WxHxD) Heating/Stirring Rod	9,7 cm x 37,3 cm x 9,6 cm
Dimensions (WxHxD) Container	38,0 cm x 21,0 cm x 24,0 cm
Max. volume level	50 dB
Stirring speed	2500 rpm
Materials	PP, stainless steel
Recommended FFF support materials	VXL 70 VXL 90
Recommended detergents	VXL solve VXL EX

Safety instructions and warnings

The following information must be observed during the operation of the starter kit:

- VXL GO is only intended for domestic use. Continuous operation is not permitted.
- The container can only be transported when empty. Do not transport or carry it when filled with water or washing solution. Empty the container before moving it using the supplied siphon pump. Do this in multiple steps if needed.
- Place the starter kit on a dry, stable, level, heat- and waterproof surface only. The starter kit may only be used in a dry, well ventilated indoor environment.
- Connect the starter kit to a suitable power source (230 V AC, 50 Hz). Pay attention to not bend the power cord or pull it when unplugging. Do not use an extension cable and do use a grounded plug.
- Do not touch the openings of the heating/stirring rod while it is in operation.
- Keep the starter kit away from children and only operate it supervised. It may only be operated by adults.
- Do not operate the starter kit if you notice that any of the parts are defective or missing.
- The black top of the heating/stirring rod contains the electronics and must not become wet.
- The surfaces of the starter kit, as well as the washing solution, will become hot during operation. Do not heat the solution bath above 60 °C. Never place your hands within the solution bath when hot.
- The VXL GO starter kit and its parts must not be used to prepare or store food. The VXL support material, VXL solve and VXL EX are not suitable for consumption.

- Only water may be used as solvent and only VXL solve or VXL EX as detergent. Do not use any flammable liquids. Do not fill the container above the fill level of 10 L. Follow the dosage recommendation of the VXL solve or VXL EX.
- Only 3D printed models with support structures out of VXL 70 or VXL 90 may be processed.
- VXL solve, VXL EX and the base, when mixed with water, are classified as irritants. Please always use the provided protective gear consisting of safety glasses and gloves. Use the provided pliers for inserting and removing models.
- If washing solution or detergent comes into contact with your skin, wash it off thoroughly with plenty of water. If washing solution or detergent comes into contact with your eye, wash it thoroughly with water for several minutes and remove any contact lenses beforehand. If eye or skin irritation persists, please seek medical advice.
- If you have inhaled the detergent, seek a well-ventilated environment and ensure unobstructed breathing. If you persistently feel unwell, seek medical advice.
- If swallowing occurs, drink plenty of water in small sips and consult a doctor. Do not try to induce vomiting.
- Remove all clothes that come into contact with the detergent or washing solution and wash them.
- Skin contact with the hot washing solution or hot surfaces may cause scalding. If scalding occurs, ensure sufficient cooling of the affected areas. The risk of scalding is present when opening the container due to the escaping hot steam. The same may happen when removing the rod from the filled container and the washing solution exits the openings of the heating/stirring rod.
- When removing the heating/stirring rod from the container, make sure that it is switched off.

Preparation

Unpack the starter kit carefully. Please ensure that the delivery is complete. In case of damaged or missing parts, do not operate the starter kit and contact your supplier. Allow the starter kit to adapt to the surrounding ambient temperature before first use. This can be done by allowing it to rest for one hour within the designated environment.

Accessory Checklist

The starter kit comes with the following parts included:

- 1x PP container
- 1x PP perforated lid
- 1x heating/stirring rod
- 1x pliers
- 1x siphon pump
- 1x safety glasses
- 1 pair of nitrile gloves
- 1 coil of VXL 70 or VXL 90 support material
- 1 sachet of VXL solve

Setup

Set up the starter kit on a dry, stable, level, heat- and waterproof surface. When setting up, keep in mind that the weight of the container including washing solution and heating/stirring rod amounts to 12 kg. Furthermore, the starter kit may only be used in a dry and well ventilated indoor environment. Ideally, place the container next to or inside a sufficiently large sink. This will simplify the emptying process later on.

Filling and Operation

Fill the container with 10 L of tap water and check it for leaks. Pay attention to the fill level marking on the label. Add the entire contents of the VXL solve detergent sachet (180 g) into the solution bath. Make sure to use safety glasses and protective gloves! 180 g detergent can dissolve 180 g VXL support material. Close the container with the perforated lid, and insert the heating/stirring rod through the large opening into the container. For ideal flow, the display should point towards the center of the container. Connect the power plug of the heating/stirring rod and switch it on using the touch display. The power cord must not be put under tension. The stirrer should start to spin audibly, and the actual water temperature will appear on the display. Press the thermometer symbol and adjust with the arrow buttons until the desired temperature (maximum 60 °C) has been reached. Press and hold the arrow buttons to adjust the temperature faster. After pressing the clock symbol, you can adjust the heating/stirring duration in the same manner with the arrow buttons. As soon as you stop pressing any button, the display will blink three times and then the actual water temperature will be displayed. The adjustments made will be automatically saved. Once the desired temperature has been reached, the clock starts counting down. The display alternates between showing the water temperature and the time remaining.



Tip: If you do not unplug the heating/stirring rod, temperature and time adjustments remain saved.



Caution: The washing solution reaches a pH value of 11.0. Do not inhale detergent.



Caution: During operation, hot washing solution will flow out of the bottom opening of the heating/stirring rod when removed from the filled container. Additionally, hot steam will escape when opening the container.

Operation

This section describes the operation of the starter kit and provides reference values for temperatures for each model and support materials of the printed object.

Controls

The following image illustrates the touch display of the heating/stirring rod.



The center of the bottom row contains the red power button for switching the rod on and off. On the left and right of this there are green arrow buttons for increasing (right arrow) and decreasing (left arrow) the temperature and time. The middle row contains two green buttons for switching between the temperature (thermometer symbol) and time (clock symbol) settings. The top row alternates between showing the actual water temperature and the remaining heating/stirring time

during operation. In the Temperature and Time setting modes, the display shows the corresponding selected value, which can be adjusted with the arrow buttons.

Recommendations for materials and temperature

The following table contains the recommended VXL support / model material combinations and solution bath temperatures:

Support material	VXL 70	VXL 90
Model material	TPU	TPU
	PET(G)	PET(G)
		ABS
		ASA
Solution bath temperature	Minimum 40 °C	Minimum 55 °C

To avoid damage due to overheating, check the temperature and fill level of the washing solution regularly. Check with the manufacturer for the tolerated dissolving temperatures of the model material. As a guide, keep the value 20 – 30 °C below the glass transition temperature (T_g) of your model material. Should you set the temperature too high, your model may become irreversibly damaged due to deformations caused by residual stresses from the print job. Should you not be able to obtain this information from the manufacturer, you can test your material yourself. For example, you could print a simple rod and test it for deformation in the solution bath.



Caution: Do not use a temperature above 60 °C.

Insert parts

Use the provided protective gear (safety glasses and protective gloves) when inserting parts, to avoid scalding and skin irritation. Switch the heating/stirring rod off, open the lid and insert the parts carefully into the solution bath. Use the provided pliers for insertion.

Close the lid after inserting the parts, and switch the heating/stirring rod on again.



Tip: To accelerate the dissolving process, you can mechanically remove support material that is easy to remove before insertion. When doing so, make sure that you do not damage delicate areas of the print object.



Caution: When removing parts of the support structure mechanically, always wear the provided tight-fitting safety glasses. Splintering parts of the support structure can damage eyes or lead to cuts. Make sure to wear suitable protective gloves. Do NOT use the provided protective gloves, since these do not provide mechanical protection.



Caution: The maximum fill level of 10 L must not be exceeded even after inserting the parts.

Remove parts

The printed parts can be removed during operation.



Caution: If you remove printed parts during operation, you must wear the provided protective gear (safety glasses and protective gloves). The starter kit comes with a set of pliers for easy removal. Before opening the lid you need to switch off the heating/stirring rod.

The time needed to fully dissolve the support structure of a printed object strongly depends on the geometry of the part, the model material, the support material and the solution bath temperature. The model material determines the maximum solution bath temperature at which there is no risk of damage to the part. At the same time, the temperature of the washing solution should be chosen to be as high as possible (maximum 60°C), to optimize the dissolving speed. The thicker and harder the accessible support structure is, the longer the process will take. Thus, the dissolving process can take anywhere from under an hour to several hours.



Tip: Once you have reached a 1:1 ratio of VXL support material to VXL solve detergent, the dissolving duration increases gradually at first, before increasing significantly. This is the moment where you should use a new washing solution.

After removing the printed parts, they must be cleaned from the washing solution on all sides for a few minutes under warm freshwater. This can be done in a water-filled container or sink.

After the cleaning process, all printed parts should be placed on paper towels to dry, since the washing solution may still leak out of gaps and cavities. Therefore, rotate the parts regularly. The drying time for the part depends strongly on the structural geometry and the applied degree of infill and can take from some hours up to some days.

You can dissolve the support material from as many printed parts in the washing solution until a total of 180 g of support material has been dissolved. There is no need to always renew the washing solution after each printed part.

Emptying

The washing solution will be used up as soon as 180 g support material has been dissolved in it (in case of 180 g VXL solve detergent).



Tip: Keep track of the amount of support material already dissolved, to replace the washing solution timely.



Caution: When emptying, the provided protective gear (safety glasses and protective gloves) must be worn to prevent injuries.



Caution: Never empty hot washing solution while still hot. Always wait until the washing solution cools down to room temperature.

During the emptying process, make sure to perform the following steps:

- Switch off the heating/stirring rod and let the washing solution cool down to room temperature.
- Have an additional container (with a minimum capacity of 10 L) ready.
- Do not move the starter kit when filled under any circumstances!
- Insert the rigid rod of the provided siphon pump completely into the starter kit via the small hole in the lid, until it sits diagonally in the container and reaches the bottom.
- Close the venting valve of the siphon pump and make sure that the flexible rod is introduced into the prepared container. The exit of the pump must be located underneath the level of the starter kit bottom.

- Quickly squeeze and release the red head of the siphon pump repeatedly, until the washing solution exits continuously from the outlet of the siphon pump. Make sure to check that the washing solution flows into the prepared container. The emptying will continue automatically (“siphoning principle”).
- Once the starter kit is almost empty, tilt it slightly to drain the washing solution as completely as possible. The residue can be pumped out through manual operation of the siphon pump.
- After complete draining of the washing solution, open the venting valve of the siphon pump.



Tip: The washing solution can be disposed of down the drain. Inform yourself whether special local wastewater regulations apply in your region.



Tip: The emptying can be split into several steps by opening the venting valve during draining, and thus, interrupt the pumping process.

Cleaning and Maintenance

We recommend cleaning the VXL GO starter kit after each use, to increase its lifespan.



Caution: Always disconnect the heating/stirring rod before cleaning. Do not immerse the rod under water under any circumstances, and avoid water splashes on the rod or power plug. Do not use abrasive or aggressive cleaners. Make sure to wear safety glasses and protective gloves.

Follow these steps for cleaning:

- Follow the steps for emptying, as described in the section “Emptying”.
- Open the lid and take the heating/stirring rod out via the opening. Place the heating/stirring rod on paper towels.
- The rod sleeve can be removed after a slight rotation.
- The rod, its sleeve, and the container can be cleaned with a brush, cloth or sponge and water with an ordinary detergent. After cleaning, rinse the rod, sleeve, and container with clean water.
- Support material residue can be disposed of with common packaging or plastic waste.



Make sure that the black top of the heating/stirring rod does not get wet.

- Slide the sleeve over the rod again and fasten it with a slight clockwise rotation until snapped in.
- Close the container with the perforated lid and introduce the heating/stirring rod via the big opening into the container.

No regular maintenance is required for the heating/stirring rod. Regularly check that the stirrer and heater function correctly.

Disposal

For the protection of the environment, resources, and health, we ask you to be responsible and recycle the VXL GO Starter kit at the end of its lifetime. The container, lid and siphon pump can be disposed of in common packing or plastic waste.

The heating/stirring rod must not be disposed of with common household waste or residual waste, but must be taken to a collection point for electrical and electronic waste.

Behavior in the case of failure

Should a fault occur with the heating/stirring rod, the stirrer and heater will be automatically switched off. An error code will be displayed, the cause and solution of each error is listed below:

Code	E1
Cause	Failure of the device.
Solution	Switch off the heating/stirring rod and replace it.
Code	E2
Cause	Overheating of the solution bath.
Solution	Switch off the rod. Refill with water and wait until the solution bath cools down. Subsequently, you can switch the rod on again and continue with the dissolving process.
Code	E3
Cause	The water level fell below the MIN mark of the rod.
Solution	Switch off the rod and refill with water. Subsequently, you can switch on the rod and continue the dissolving process.
Code	E4
Cause	Overheating of the heating element.
Solution	Switch off the rod. Refill with water and wait until the rod cools down. Subsequently, you can switch on the rod and continue the dissolving process.

Code	E5
Cause	The temperature of the solution bath is higher than the selected temperature.
Solution	Switch off the rod. Refill with water and wait until the solution bath cools down. Switch on the rod and continue the dissolving process afterwards.

Should you not be able to detect any flow within the solution bath, make sure that the display of the rod points towards the center of the container. If necessary, remove the rod and let it cool down. Always remove the power plug before this step. Subsequently, take off the sleeve and verify whether openings of the sleeve or rod are blocked. The openings must be free, and the stirrer should turn easily. Do not start up the starter kit again with a malfunctioning heating/stirring rod.

As an EXCEPTION to the previous warning (Never empty hot washing solution while still hot): If you detect a leak in the container, switch off the rod and empty the container while it is still warm, analogous to the steps under "Emptying". Do not start up the starter kit again until you have a new container.

We offer and supply replacement containers and rods.

Additional information

For additional information, further questions, or supply of detergent, you can contact us under:

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