

# Operating modes

The SnowWhite printer has two modes of operations that differ from each other in the way heaters are controlled. The operating mode is chosen using the parameter 'Temp. Control' which can take the values 'Powder' and 'Environment'. In 'Powder' mode the heaters are controlled by the surface temperature of the powder, while in 'Environment' mode they are controlled according to the internal temperature of the build chamber.

## Environment mode

In the modality 'Environment' the heaters are controlled by the ambient temperature in the building chamber; the main advantages of this modality are the performing speed and the simplicity in the parameters setting.

The main disadvantage is the lower quality of the object in terms of mechanical resistance and surface finish; this is due to the fact that during the printing process, the temperature of the powder bed, not used for the regulation, tends to grow and this increase in temperature in the worst case could transfer too much energy to the powder bed ( see section 'Common problems').

## Powder mode

In 'Powder' mode the heaters are controlled by the temperature of the powder bed, is the recommended mode for experienced users.

The main disadvantage is the duration of the process which could be the double than the time needed to complete the same object in the modality 'Environment'.

## Parameters

Selecting the 'Parameters' button on the main screen you can find the operating parameters, each parameter can be modified choosing its name.

The available parameters are:

- Rate: laser movement speed in points per second for the inner part of the object, the value must be between 1 and 64,000;
- Power: laser power for the inner part of the object, the value must be between 20 and 100%;
- Border rate: laser movement speed in points per second for the border of the object, the value must be between 1 and 64,000;
- Border power: laser power for the border of the object , the value must be between 20 and 100%;
- Temp Control: control method of the heaters, 'Powder' means depending on the surface temperature of the powder or 'Environment' means depending on the internal temperature of the build chamber;
- Plate temp: surface temperature of the powder bed; it mustn't be more then 210 degrees. It is used only when in 'Powder' operating mode;
- Env. Temp: temperature at which is kept constant the build chamber in the 'Environment' mode; in 'Powder' mode it is the minimum temperature at which the build chamber should arrive at the end of the heating process;
- Change At: layer of the object at which the temperature will be changed to 'Change Temp To', set to 0 to disable the temperature change;
- Change Temp. To: new temperature value to be set when the object layer is 'Change At', there is a limit of 2°C on the temperature change for each layer, so in case of a grater difference the change is spread on multiple layers;
- Warming layers: pre-heating layer which must be done before starting the printing process;
- Wait temp: number of seconds to wait at the end of the heating process and before starting the

- printing process;
- Wait layer: seconds to wait after the recoater movement at the end of each layer;
  - Tank Offset mm: Millimetre distance from the bottom of the tank at which the lateral pistons are set for the first layer, increasing this parameter will reduce the amount of powder needed for a full powder load of the machine but will reduce the printable height. Tank's height at 0 offset is 140 mm.
  - Powder layer: movement in millimetres of the loading pistons for each layer; the minimum setting is 2.5 times the size of the building plane, the value depends from the kind of powder used from the object surface. Usually 3.0 is a safe setting for PA12;
  - Last layer: if different from zero the machine will stop the building process at this layer;
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- X Shrinking: percentage increase to be applied to the object along the X axis;
  - Y Shrinking: percentage increase to be applied to the object along the Y axis;

## **Limits**

The printing parameters 'Rate' and 'Border rate' must be between 0 and 64,000 and the value represents the speed rate of the laser in points per second.

The parameters 'Power' and 'Border power' must be between 20 and 100, they represents the laser power used for the filling and for the perimeters of the objects. A value lower then 20% doesn't guarantee the stability of the laser emission.

The temperature of the powder bed 'Plate temp' mustn't be more then 210°C because the mechanical and optical parts can be damaged.

The environment temperature of the build camera mustn't be more then 170°C, the machine will automatically stop in case of overheating.

In case the Galvo scanhead temperature will overcome 65°C the machine will automatically switch off.