1- Zetamix General guidelines - Zetamix Epsilon

The recommendations are considered to work as a standard guideline and must be adapted to individual wall-thickness and part-design. Please note that Epsilon filament does not require post-processing (debinding or sintering)
Permittivity and loss of the final part depends highly on the density of the part. Even a very small amount of porosity can significantly reduce the permittivity of the material. If you need high permittivity, you should print with 100% infill and a significant overflow.

Printing instructions:
To print our Zetamix Epsilon filaments, we recommend using a printer with a controlled **heated chamber** that can reach **120°C**, a maximum plate temperature of 130°C (110°C - 120°C is optimal) and a maximum hotend temperature of 330°C. Please note that for parts with a base smaller than 3 cm², it is not necessary to have a controlled heating chamber. We recommend the use of a wear resistant nozzle, for instance with a ruby or ceramic tip. We highly recommend using the glue "**Scotch permanent glue stick**" to help the adhesion on the bed , as glue sticks made from natural ingredients will not withstand the temperature.
The filament is advised to be used for one year.

If no heated chamber :

- For parts with a base < 10cm * 10cm

- Use a brim instead of a skirt.
- Use a spool holder above the extruder.
- Use a flexible plate.
- Apply a layer of the recommended glue on the bed (avoid warping and protect the flexible plate).
- Heat the chamber to 40°C if possible.

- For parts with a base between 10cm * 10cm & 20cm * 20cm

- The recommendations for a base smaller than 10cm*10cm should be respected.
- If your printer is not equipped with a bed mapping function, tram the plate within +-0.05 mm of height deviation to avoid warping issue (for Raise pro 2 for example).
- Use a slow cooldown of the bed (10°C every 30min to avoid distorting the part during the cooldown).

- For parts with a base > 20cm * 20cm

- All of the above recommendations should be respected, except for the use of a flexible plate
- Use a glass plate, as they are thicker and therefore retain the heat better. It may take longer to heat up, but it provides a better heating chamber.
- Use a slow cooldown of the plate bed (10°C every hour).
- At the end of the printing process, remove the plate, let the part cool down and you can easily remove the part without any special tools.
- Please note that even with a glass plate you must use some glue to print the first layer properly.

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- For parts with a height > 2cm

- To limit delayering as much as possible, slow down the printing speed to 5-7.5mm/s and reduce layer thickness to 0.1 mm.
- Ideally, parts higher than 2cm should be printed in a 120°C heated chamber to avoid any issue.

Filament characteristics

Typical material properties				
	Zetamix **Ɛ = 2.2**	Zetamix **Ɛ = 4.5**	Zetamix **Ɛ = 7.5**	Zetamix **Ɛ = 10**
Product	Filaments for FDM process	Filaments for FDM process	Filaments for FDM process	Filaments for FDM process
Binder basis	Polyolefine based binder system	Polyolefine based binder system	Polyolefine based binder system	Polyolefine based binder system
Appearance	Translucent white	Beige	Beige	Beige

Printing parameters: Refers to the IdeaMaker parameters guidelines

Zetamix **Ɛ = 2.2**

Typical processing properties		
Printing temperature	270 – 300°C	
Plate temperature	110°C	
Nozzle size	0.4 - 1.0 mm	
Layer thickness	0.1 – 0.5 mm	
First layer printing speed	2.5 mm/s	
General printing speed	10-15mm/s	
Cooling	0% (remove fan)	

Zetamix **Ɛ = 4.5**

Typical processing properties		
Printing temperature	270 – 300°C	
Plate temperature	110°C	
Nozzle size	0.4 mm 0.6 mm	
Layer thickness	0.1 – 0.2 mm	
First layer printing speed	2.5 mm/s	
General printing speed	10-15 mm/s	
Cooling	0% (remove fan)	

Zetamix **ε = 7.5**

Typical processing properties		
Printing temperature	270 – 300°C	
Plate temperature	110°C	
Nozzle size	0.4 mm 0.6 mm	
Layer thickness	0.1 – 0.2 mm	
First layer printing speed	2.5 mm/s	
General printing speed	10-15 mm/s	
Cooling	0% (remove fan)	

Zetamix **ε = 10**

Typical processing properties		
Printing temperature	270 – 300°C	
Plate temperature	110°C	
Nozzle size	0.4 mm 0.6 mm	
Layer thickness	0.1 – 0.2 mm	
First layer printing speed	2.5 mm/s	
General printing speed	10-15 mm/s	
Cooling	0% (remove fan)	

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