

# Phrozen Resin User Guide

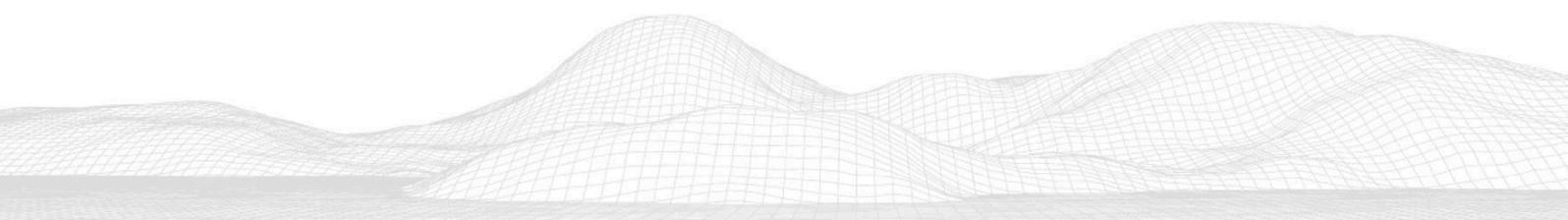
## EL400 Resin

### Outline

Before printing the perfect object, it is important to first understand the material limitations we are handling and how it can be successfully printed under various conditions. With this in mind, Phrozen provides the following design suggestions to help you better understand the properties of each material and how you can best utilize them to bring your wildest creation to life.

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## Section 1

# TDS

General Properties	Norm	Typical values
Appearance	-	Gray
Viscosity, 25 °C	Cone/Plate Rheometer <sup>1</sup>	2300–3000mPas
Density (liquid resin)	ASTM D4052-18a	1.04 g/cm <sup>3</sup>
Tensile Properties	Norm	Typical values (UV post-cured)
Tensile Strength at Break	ASTM D412	6.3 MPa
Elongation at Break	ASTM D412	391 %
Tear Strength	ASTM D624	22 kN/m
Hardness	Norm	Typical values (UV post-cured)
Shore A	ASTM D2240	70–75A
Resilience testing	Norm	Typical values (UV post-cured)
Rebound Resilience	ASTM D7121	40 %

*\* All testing specimens are printed using Phrozen Sonic Mighty 8K and post-cured using Phrozen Wash & Cure Kit.*

Specimens are printed unless stated otherwise. The information in this TDS, including product recommendations, is based on our current knowledge and experience. Descriptions, drawings, photographs, data, proportions, weights, etc. provided may change without notice and do not establish the product's contractual quality. Request the relevant MSDS from your supplier or contact Phrozen Tech Co., Ltd at [sales@phrozen3d.com](mailto:sales@phrozen3d.com)

## Section 2

# Printing

## Printing Parameters

<b>Printer</b>	Sonic Mini / Sonic Mini 4K
<b>Layer Height</b>	100 $\mu\text{m}$
<b>Exposure Time</b>	15–20 s
<b>Bottom Exposure Time</b>	30–35 s
<b>Light-off Delay</b>	13–20s
<b>Lift Distance</b>	10 mm
<b>Lifting Speed</b>	45 mm/min

<b>Printer</b>	Sonic Mini 8K
<b>Layer Height</b>	100 $\mu\text{m}$
<b>Exposure Time</b>	10–15 s
<b>Bottom Exposure Time</b>	20–25 s
<b>Rest Time After Retract</b>	8–10s
<b>Lift Distance</b>	10 mm
<b>Lifting Speed</b>	45 mm/min

<b>Printer</b>	Sonic Mini 8K S
<b>Layer Height</b>	100 $\mu\text{m}$
<b>Exposure Time</b>	10–15 s
<b>Bottom Exposure Time</b>	20–25 s
<b>Rest Time After Retract</b>	8–10s
<b>Lift Distance</b>	10 mm
<b>Lifting Speed</b>	45 mm/min

<b>Printer</b>	Sonic Mighty 4K
<b>Layer Height</b>	100 $\mu\text{m}$
<b>Exposure Time</b>	10–20 s
<b>Bottom Exposure Time</b>	25–30 s
<b>Light-off Delay</b>	17–25 s
<b>Lift Distance</b>	10 mm
<b>Lifting Speed</b>	45 mm/min

<b>Printer</b>	Sonic Mighty 8K
<b>Layer Height</b>	100 $\mu\text{m}$
<b>Exposure Time</b>	10–20 s
<b>Bottom Exposure Time</b>	25–30 s
<b>Rest Time After Retract</b>	8–15 s
<b>Lift Distance</b>	10 mm
<b>Lifting Speed</b>	45 mm/min

<b>Printer</b>	Sonic Mighty 12K (Upgrade Kit)
<b>Layer Height</b>	100 $\mu\text{m}$
<b>Exposure Time</b>	10–20 s
<b>Bottom Exposure Time</b>	25–30 s
<b>Rest Time After Retract</b>	8–15 s
<b>Lift Distance</b>	10 mm
<b>Lifting Speed</b>	45 mm/min

<b>Printer</b>	Sonic Mighty Revo
<b>Layer Height</b>	100 $\mu\text{m}$
<b>Exposure Time</b>	10–15 s
<b>Bottom Exposure Time</b>	25–30 s
<b>Rest Time After Retract</b>	8–15 s
<b>Lift Distance</b>	10 mm
<b>Lifting Speed</b>	45 mm/min

<b>Printer</b>	Sonic Mega 8K
<b>Layer Height</b>	100 $\mu\text{m}$
<b>Exposure Time</b>	10–15 s
<b>Bottom Exposure Time</b>	25–30 s
<b>Rest Time After Retract</b>	8–20 s
<b>Lift Distance</b>	10 mm
<b>Lifting Speed</b>	45 mm/min

<b>Printer</b>	Sonic Mega 8K S
<b>Layer Height</b>	100 $\mu\text{m}$
<b>Exposure Time</b>	9–13 s
<b>Bottom Exposure Time</b>	20–25 s
<b>Rest Time After Retract</b>	8–20 s
<b>Lift Distance</b>	10 mm
<b>Lifting Speed</b>	45 mm/min

<b>Printer</b>	Sonic Mega 8K V2
<b>Layer Height</b>	100 μm
<b>Exposure Time</b>	9–13 s
<b>Bottom Exposure Time</b>	20–25 s
<b>Rest Time After Retract</b>	8–20 s
<b>Lift Distance</b>	10 mm
<b>Lifting Speed</b>	45 mm/min

\* Sonic Mega 8K ,Sonic Mega 8K S and Sonic Mega 8K V2 have a higher peeling force.

Therefore, a longer exposure time is necessary to increase the success rate.

\* Be sure to cover the hood when printing to maintain the best printing condition of the resin.

## Cleaning

1. After removing the printed object from the building stage, use the Phrozen Wash and Cure Kit for post-processing.
2. Soak the object in the Washing Station filled with 95% alcohol to remove uncured resin from the model.
3. Make sure to clean the inner parts of hollow objects completely.
4. After the object has been thoroughly cleaned, leave it in a cool, well-ventilated place for at least 30 minutes without exposure to light. Alternatively, you may gently apply compressed air to dry the printed object.

## Post-Curing

1. Use Phrozen post-curing lamps (Phrozen Curing Station in Wash & Cure Kit / Phrozen Cure Mega S) or other post-curing lamps with the same wavelength to cure printed objects.
2. Soak the models in glycerin and post-cure for about 30 minutes. Then, clean up the models with water and leave them in a cool, well-ventilated place for at least 30 minutes without exposure to light.

## Section 3

# Suggestions for Printing

### Before Use

Due to the high viscosity of the resin, thoroughly shake the resin before pouring it into the container to ensure a uniform distribution of the colorant.

### Print Settings

1. The recommended printing thickness is 100 um.
2. The model wall thickness needs to be 1.5 mm or more.
3. It is recommended to slow down the lifting and return speed, and increase the rest time. The return speed should be adjusted according to the type of model, with a recommended setting of 120–150 mm/min.
4. The recommended support thickness setting is 1.0 mm / 1.2 mm.
5. It's recommended to print models directly on the build plate to minimize deformation.
6. Please note that if the space between supports or within the model's structure is too small, the resin may solidify within the gaps.

### Post Processing:

1. Soaking in glycerin can help improve the structural integrity of soft materials and reduce the stickiness of post-cured object surfaces.
2. After curing, the object should be promptly cleaned thoroughly, avoiding prolonged soaking in glycerin.

Note: Please avoid soaking the models in any liquid for a prolonged period (including alcohol, glycerin, and water) to avoid absorption of liquid that may cause expansion and deformation.

## Section 4

# Applications

