【Phrozen Resin User Guide】

Phrozen Speed 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.

Table of Contents

Section 1

TDS

Mechanical Properties*	Unit	Results	Method
Tensile Stress at Break	MPa	25	ASTM D638
Young's Modulus	MPa	900	ASTM D638
Elongation at Break	%	20	ASTM D638
Izod Impact Strength (Notched)	J/m	6.31	ASTM D256
Shore D Hardness (0s, 3s)	-	79	ASTM 2240
Liquid Properties			
Viscosity at 25°C (77°F)	cP	230	ASTM D1475
Liquid Density	g/cm³	1.1	ASTM D7867

** All testing specimens are printed using Phrozen Sonic Mega 8K or Sonic Mini 8K, and post-cured using Phrozen Cure V2 or Cure Mega.*

Section 2

Printing

Printing Parameters

Printer	Sonic Mini 4K
Layer Height	150 μm
Exposure Time	5~7 s
Bottom Exposure time	15~20 s
Light-off Delay	5~7 s
Lift Distance	3 mm
Lifting Speed	60 mm/min

Printer	Sonic Mini 8K
Layer Height	150 μm
Exposure Time	2.5~3.5 s
Bottom Exposure time	15~20 s
Rest Time After Retract	1~3 s
Lift Distance	3 mm
Lifting Speed	60 mm/min

Printer	Sonic Mighty 4K
Layer Height	150 μm
Exposure Time	2.5~3.5 s
Bottom Exposure time	25~35 s
Light-off Delay	5~7 s
Lift Distance	3 mm
Lifting Speed	60 mm/min

Printer	Sonic Mighty 8K
Layer Height	150 μm
Exposure Time	3~4 s
Bottom Exposure time	20~30 s
Rest Time After Retract	1~3 s
Lift Distance	3 mm
Lifting Speed	100 mm/min

Printer	Sonic Mega 8K
Layer Height	150 μm
Exposure Time	3.5~4.5 s
Bottom Exposure time	30~35 s
Rest Time After Lift	2~3 s
Lift Distance	4 mm
Lifting Speed	100 mm/min

Printing Suggestions

Rest Time

When printing solid objects, it's recommended to add 1-2 seconds of rest time / light-off delay.

Assembly

When printing joints and assembled parts, it's recommended to add supports to avoid overexposure on the bottom layer and causing joints to be printed inaccurately.

※Use thicker support when printing larger models to avoid failed prints※

Printing Object with Large Surface Area

When printing objects with a larger surface area, the peeling force may be stronger, resulting in faster relaxation of the release film. It is recommended to put the model on an angle to reduce the peeling force.

Tolerance

Since this material is hard and brittle, it is recommended to increase tolerance for parts that need to be bent to avoid breakage

Cleaning

After removing the printed object from the building stage, use an ultrasonic cleaner and 95% alcohol for 60 seconds to remove uncured resin from the surface. Make sure that the object has been thoroughly cleaned, then leave it in a dark place for up to 30 minutes or use an air gun to immediately dry the printed object.

Post-Curing

Use Phrozen post-curing lamps (Cure V2, Cure Luna, Cure Mega) or other post-curing lamps with the same wavelength to cure printed objects. Cure the front and back parts for at least 30 minutes to achieve good mechanical properties and precision.

Section 3

Design Specifications

※Note: All indicators are limited to each resin; the value will vary with different machines and environmental conditions.※

Minimum Unsupported Wall Thickness

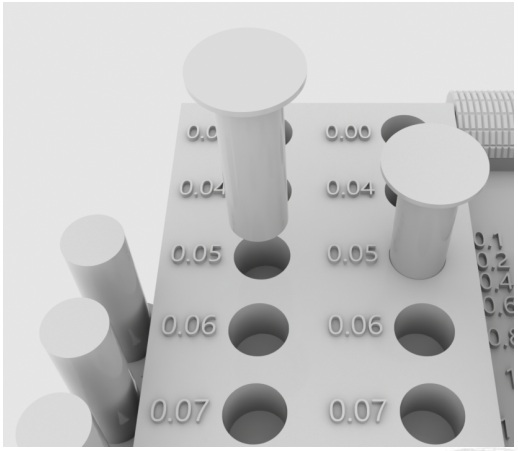
This indicator shows the minimum wall thickness that can be printed independently with no support without causing any bending or breaking.

Recommended thickness: : ≥ 0.4 mm

Size Tolerance, X-Y plane

This indicator shows the minimum dimensional tolerance between the hole and the column parallel to the XY plane.

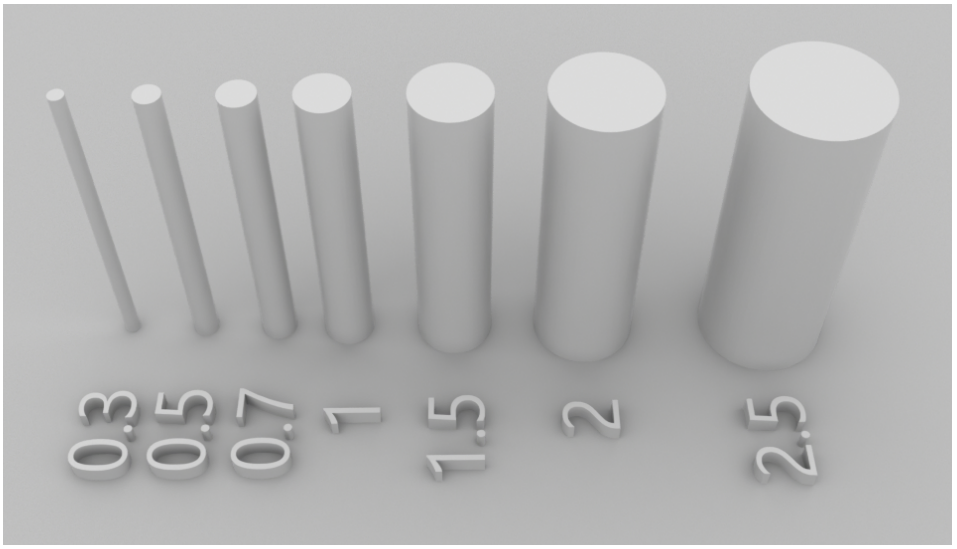
Recommended tolerance: ≥ 0.06 mm



Minimum Pin Diameter

This indicator shows the minimum column diameter of pillars and supports that can be printed independently without bending or breaking.

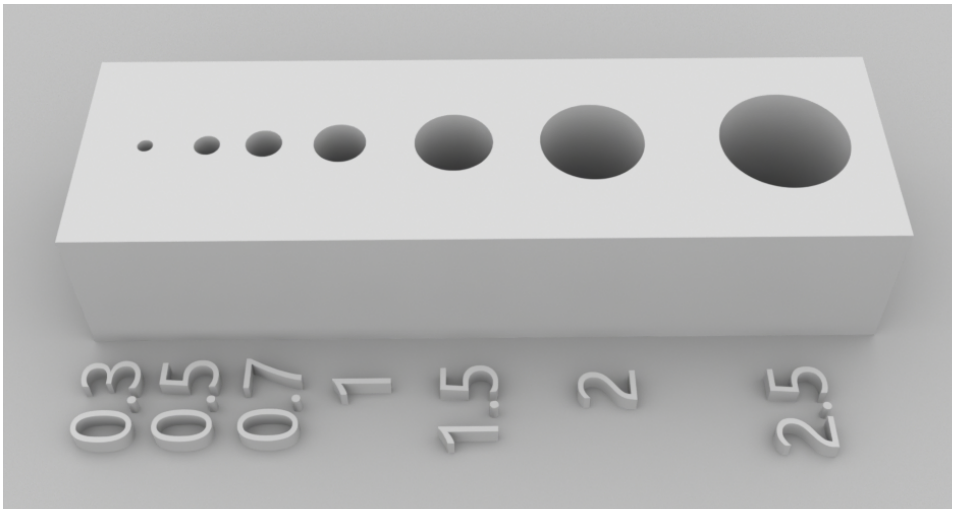
Recommended diameter: ≥ 0.5 mm



Minimum Hole Diameter, X-Y plane

This indicator shows the minimum hole diameter that can be successfully printed parallel to the XY plane.

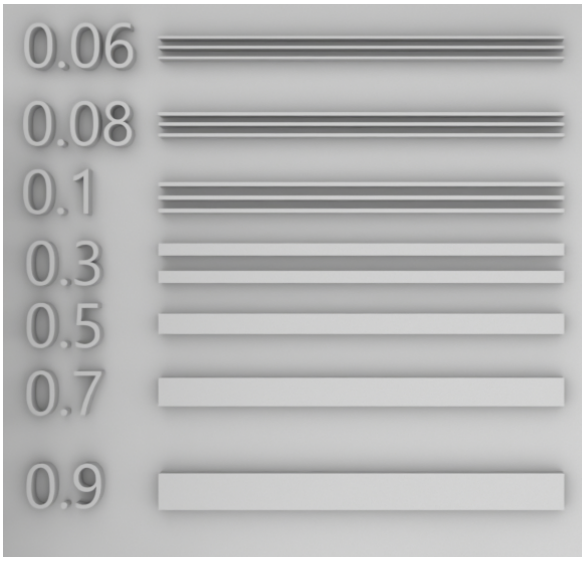
Recommended diameter: ≥ 0.7 mm



Minimum Embossed Detail Width, X-Y plane

This indicator shows the minimum line width that can successfully be printed with embossed details.

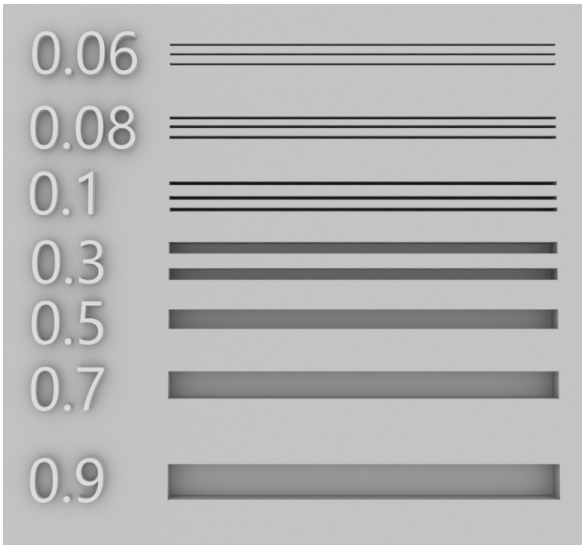
Recommended width： ≥ 0.3 mm



Minimum Engraved Detail Width, X-Y plane

This indicator shows the minimum line width that can successfully be printed with engraved details.

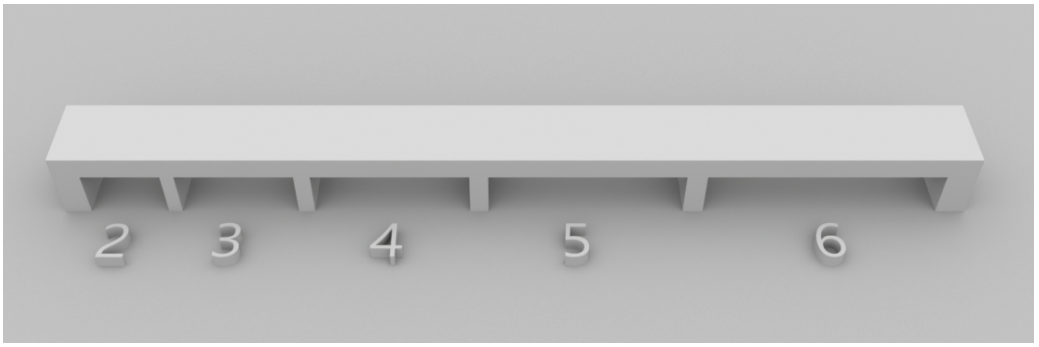
Recommended width： ≥ 0.06 mm



Maximum Horizontal Bridge Span

This indicator shows the maximum width between the supporting walls that can be printed without deforming the bridge.

Recommended width： ≥ 6 mm

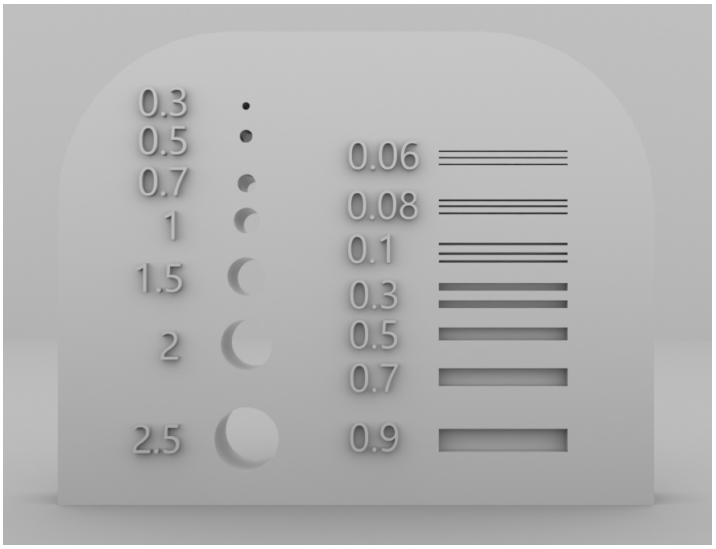


Minimum Hole Diameter and Engraved Detail Width, Z-axis, at 0.05mm Layer Height

This indicator shows the minimum hole diameter and engraving groove width that can be successfully printed on the Z axis with a layer thickness of 0.05mm.

Recommended diameter：≥ 0.5 mm

Recommended width：≥ 0.1 mm



Section 4

Printing Speed

Hollow Model			
	Speed Resin	**Other Resin**	**Speed Comparison**
Mini 4K	5~6 cm/hr	1~2 cm/hr	**3~4x**
Mini 8K	5~6 cm/hr	1~2 cm/hr	**4~5x**
Mighty 4K	5~6 cm/hr	1~2 cm/hr	**4~6x**
Mighty 8K	5~6 cm/hr	1~2 cm/hr	**5~6x**
Mega 8K	4~4.5 cm/hr	0.3~0.5 cm/hr	**9~11x**
Solid Model			
Mini 4K	5~6 cm/hr	1~2 cm/hr	**3~4x**
Mini 8K	5~6 cm/hr	1~2 cm/hr	**4~5x**
Mighty 4K	5~6 cm/hr	1~2 cm/hr	**4~5x**
Mighty 8K	5~6 cm/hr	1~2 cm/hr	**5~6x**