

【Phrozen Filament User Guide】

ASA EASY – Gray

Outline

Before printing an object, it is important to first understand the limits of the materials and how it can be successfully printed under various conditions. With this in mind, Phrozen provides the following design recommendations to help improve print success rates and produce models that better match your intended results.

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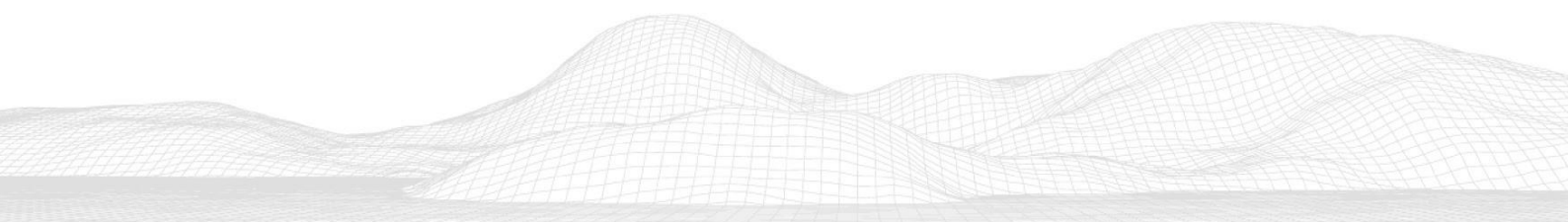
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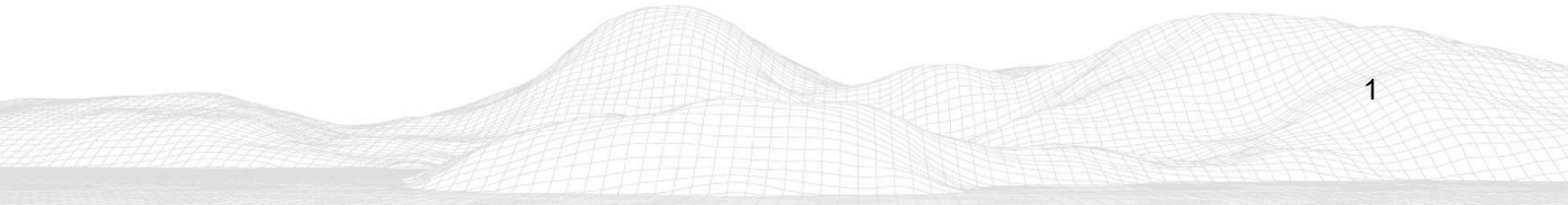
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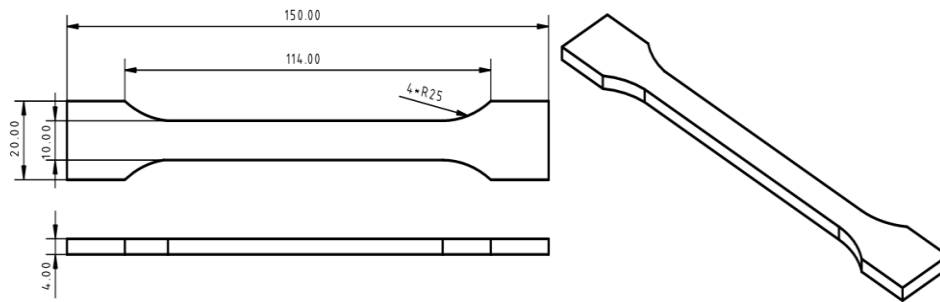
Section 1

TDS

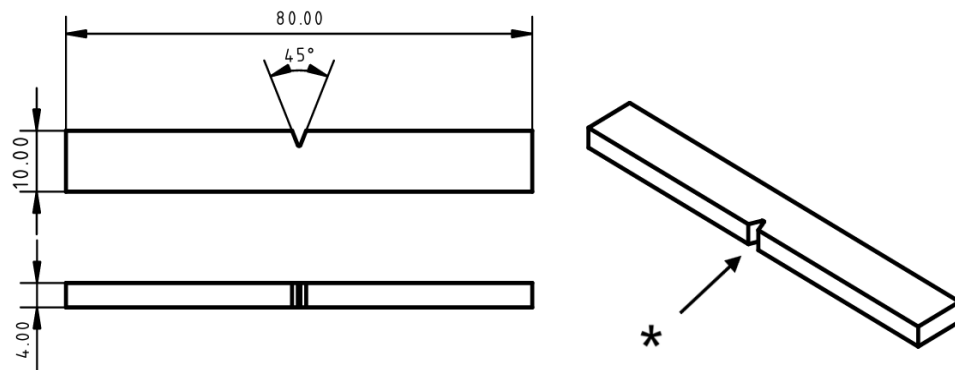
Tensile Properties	Norm	Values	
		Printing Direction (X-Y)	Printing Direction (Z)
Tensile Strength at Break	ISO 527	22.9 MPa	14.4 MPa
Tensile Modulus	ISO 527	1852.5 MPa	1526.4 MPa
Elongation at Break	ISO 527	7.4 %	1 %
Flexural Properties	Norm	Values	
		Printing Direction (X-Y)	Printing Direction (Z)
Flexural Strength	ISO 178	48.5 MPa	28.2 MPa
Flexural Modulus	ISO 178	1668.7 MPa	1336.4 MPa
Impact Properties	Norm	Values	
		Printing Direction (X-Y)	Printing Direction (Z)
Notched Izod Impact Strength	ISO 180	91.8 – 92.8 J/m	14.4 – 14.5 J/m
Thermal Properties	Norm	Values	
HDT at 0.45 MPa	ASTM D648	92.7 °C	
Hardness	Norm	Values	
Shore D	ISO 7619-1	78-82D	
Water Absorption	Norm	Values	
Short Term (24hr)	ISO 62	0.55%	

*All test pieces were printed in an environment of $25 \pm 2^{\circ}\text{C}$ and $\text{RH}55 \pm 10\%$ right after removing the vacuum bag and were set aside to cool down completely before testing.

Performance values obtained in standard sample tests conducted by Phrozen are for design reference and comparison only. The actual performance of each 3D printed model might be impacted by other variables, including the printer, printing model, printing environment, printing parameters, etc. Users are responsible for their legality, safety, and performance indicators when printing with Phrozen's material. Phrozen is not responsible for the materials and usage scenarios, nor is it responsible for any damage that occurs during the use of our materials.

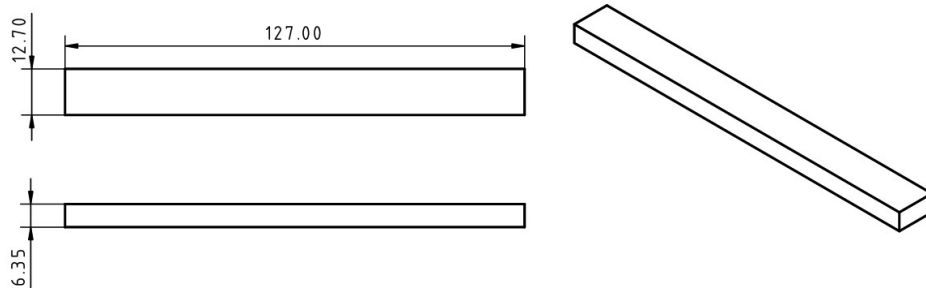


ISO 527 Tensile Specimen (unit: mm)



ISO 180 Impact Specimen (unit: mm)

*Impact test direction



ASTM D648 HDT Specimen (unit: mm)

Section 2

Printing

Filament Specifications

Appearance	Gray
Diameter	1.75 ± 0.05 mm
Density	1.05 g/cm ³
HDT 0.45 Mpa	92.7 °C
Melt Flow Index (MFI)	28 ~ 32 g / 10min
Weight	1 kg

Test Print Parameters

Nozzle Diameter	0.4 mm
Nozzle Temperature	270 °C
Heat Bed Temperature	100 °C
Printing Speed	80 mm/s
Fan Speed	<50 %
Infill Percentage	100 %

Recommended Printing Parameters

Nozzle Temperature	260 ± 10°C
Heat Bed Temperature	100 °C
Printing Speed	< 150 mm/s
Fan Speed	< 50 %

※Printing may produce a slight odor and plastic particles. Please print in a well-ventilated area.

Drying Conditions

Drying Temperature	70°C
Recommended Drying Time	4 hours

※Be sure to bake the filament before each print to remove moisture.

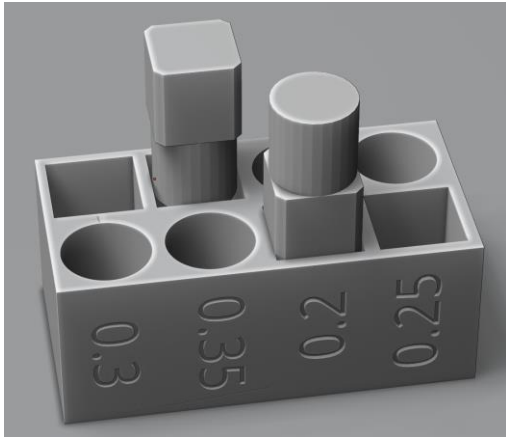
Section 3

Design Specifications

※Note: All indicators are the limit values of ASA and will vary depending on the machine, parameters, operating environment, and printing model used※

Minimum Size Tolerance

This indicator is the minimum tolerance allowed when printing the pin and hole connection.

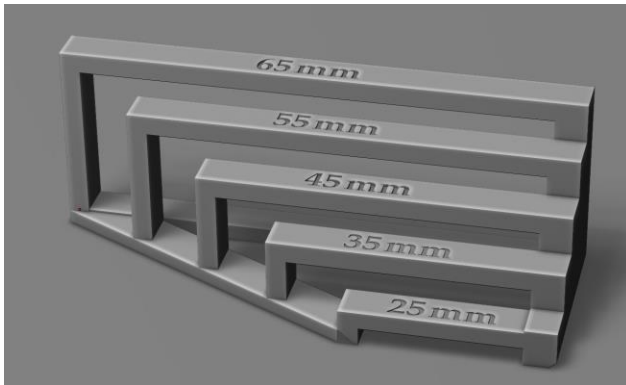


Recommended square aperture: ≥ 0.15 mm

Recommended circular aperture: ≥ 0.15 mm

Maximum Horizontal Bridge Span

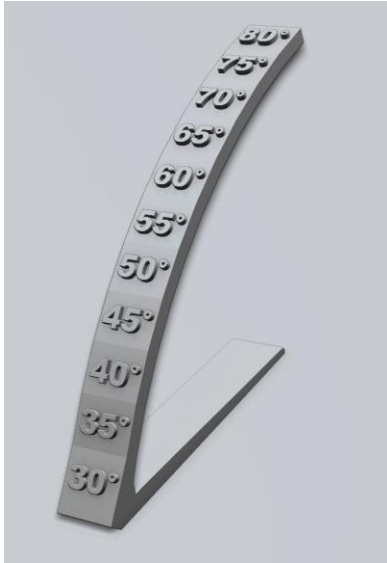
This indicator is the maximum distance that can be printed without support.



Recommended distance: ≤ 20 mm

Maximum Hanging Angle

This indicator is the maximum angle that can be printed completely without support.



Recommended angle: $< 55^{\circ}$

Section 4

Printing Recommendations

When printing ASA, avoid direct cold airflow on the print. We also recommend using a 3D printer bed adhesive spray during printing to prevent corner warping.

