



60% STAINLESS STEEL / 40% BRONZE

MATRIX MATERIAL

Steel- 3D Printing Material – 3D Printing Material

Binder Jetting

**UPLOAD A MODEL
(/MODEL/MATERIAL-
CONFIGURATOR/UPLOAD)**

Material info

About Steel- 3D Printing Material – 3D

Printing Material

Color & Finishes

Technology

Technical Documents

Material Properties

Description

Design Guidelines

Bounding Box

Walls

Wires

Material info

About Steel- 3D Printing Material – 3D Printing Material

Steel is an affordable and strong metal that is well-suited for consumer products both small and large with an industrial look and feel. It's printed using a binder jetting process and is later infused with bronze, creating a material that is 60% steel and 40% bronze and can range in color from a silver gray to reddish bronze. It is strong enough for metal parts like bottle openers and dice, but is not recommended for industrial load bearing applications.

Color & Finishes



Bronze Gold Nickel Bronzed-Silver Black

Matte

Unpolished for a rough surface and matte finish.

Polished

Parts are polished until shiny and smooth. Note: Internal detail can not be polished, well-reachable surfaces will be polished therefore tight internal spaces may remain unpolished. Products larger than 150 x 150 x 150 mm and products with particularly thin features or details will undergo bead blasting instead of the regular polishing process in order to avoid breakage. This may lead to a rougher and less consistent finish than usual.

Technology

Binder Jetting

Technical Documents

Material Data Sheet - Steel (https://www.shapeways.com/wp-content/uploads/2021/06/X1_MaterialData_420SS_062519.pdf)

Material Properties

Ultimate Strength (ASTM E8)

496 MPa

Description

Material good strength, many available
Highlights colors, supports larger parts



| | | |
|----------------------|--------|--|
| Elongation (ASTM E8) | 7.0 % | |
| Hardness (ASTM E18) | 93 HRb | |

Handling and Care not food safe, heatproof to 831°C/1521°F

Design Guidelines

Bounding Box

Bounding Box Max

762 × 393 × 393 mm (Bronzed-Silver, Bronze, Black)
 178 × 178 × 178 mm (Gold, Nickel)
 152 × 152 × 76 (Polished models)
 178 × 178 × 178 (Plated models)

Bounding Box Min

6 × 6 × 3 mm

The bounding box is a 3D imaginary outline of a box that encloses the smallest area occupied by your model. Your model must be within the minimum and maximum bounding box sizes. If the size of the model is close to the maximum bounding box, then the printing orientation will be restricted.

Walls

Supported Wall Thickness Min

Model's Longest Dimension:

3 to 75 mm = 1.0 mm
 75 to 150 mm = 1.5 mm
 150 to 200 mm = 2.0 mm
 200 to 300 mm = 3.0 mm

Unsupported Wall Thickness Min

Model's Longest Dimension:

3 to 75 mm = 1.0 mm
 75 to 150 mm = 1.5 mm
 150 to 200 mm = 2.0 mm
 200 to 300 mm = 3.0 mm

A supported wall is connected at least on two sides of the wall, while an unsupported wall is connected only on one side of the wall. Walls that do not meet the minimum requirements may not survive printing and cleaning processes. Additionally, models may still be rejected based on the wall geometry of the model. Please consider the size of your model and reinforce the walls or add support structures as needed as minimum guidelines will not always be adequate for large models.

Wires

Supported Wires Min

Model's Longest Dimension:

3 to 75 mm = 1.0 mm
 75 to 150 mm = 1.5 mm
 150 to 200 mm = 2.0 mm
 200 to 300 mm = 3.0 mm

Unsupported Wires Min

Model's Longest Dimension:

3 to 75 mm = 1.0 mm
 75 to 150 mm = 1.5 mm
 150 to 200 mm = 2.0 mm
 200 to 300 mm = 3.0 mm

A wire is a circular, rectangular or even triangular feature that is thinner in its unconnected directions than its length. A supported wire is connected at least on two sides of the model, while an unsupported wire is connected on one side of

the model. Wires that do not meet the minimum requirements may not survive printing and cleaning processes. Additionally, models may still be rejected based on the wire geometry of the model. Please consider the size of your model and reinforce the wires or add support structures as needed as minimum guidelines will not always be adequate for large models.

Details

Details Min Embossed

1.0 mm high & wide

Details Min Engraved

1.0 mm high & wide

For text, the ratio between width and depth, should be 1:1 and sans-serif fonts are preferred for line weight consistency.

Escape Holes

Single Escape Hole Diameter (Min)

4.0 mm

Multiple Escape Hole Diameter (Min)

2.0 mm

Escape holes are necessary to empty the support material of a hollow model. Two escape holes at the opposite ends of the model is optimal for the support removal process. Please consider the size of your model and make the escape holes bigger or add more escape holes as needed as minimum guidelines will not always be adequate for large models.

A single escape hole at the end of a cavity will not allow material in the corners near the escape hole to fully escape. So we recommend multiple escape holes at both ends of the cavity.

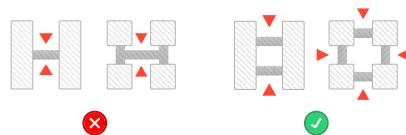
Clearance

Min

3.0 mm

Clearance is the space between two individual parts in a model. If the space among the individual parts do not meet the minimum clearance, then parts can fuse together or can be difficult to clean. This is important for movable pieces like hinges, gears, etc.

Sprues



**We cannot print Steel parts with sprues. Any part with sprues will be rejected.
Since sprues are inherently thin by design, Bronze will not be able to be infiltrated between parts that are sprued and the model will fail in production.**

Sprues are wires that keep two or more parts together. Parts should be connected with a minimum of two sprues each. Please consider the size of your sprues and increase them as needed as minimum guidelines will not always be adequate for large models. If the sprues are within the guidelines and are broken, but there is no damage to your model, we will still ship them as is.

Interlocking & Enclosed Parts

Interlocking

No

Enclosed

No

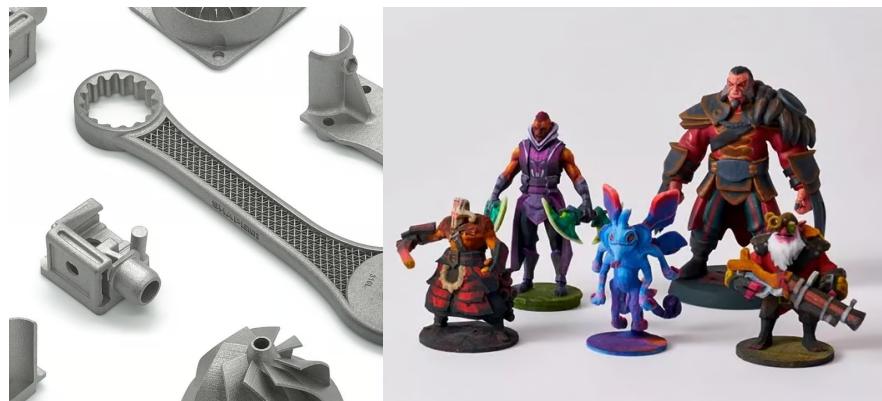
Parts in File

Max

up to 250

Accuracy

Accuracy ±5% The bronze infiltration of each steel part makes this material less dimensionally accurate than other Shapeways materials. Shrinkage is more prevalent, especially on small holes and inner diameters. Accuracy and tolerance can vary greatly depending on the model, and are hard to predict because they are so geometry specific. A 5% deviation on a ring is around 1 US ring size. So if you order a size 6, the deviation could cause the actual print to be a size 5 or 7. For example: a product with dimensions of 50 x 50 x 100 mm can be 0.05*100 mm = 5 mm bigger or smaller in any direction.

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Stainless Steel 316L - 3D Printing Material

Material

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