Slicing Guide

This guide provides a detailed baseline of the slicer settings used to successfully print the parts for this project on a specific, well-calibrated 3D printer. It is designed to be a comprehensive **starting point**, not a set of absolute rules.

Every 3D printer is different. Your machine's unique limits regarding **maximum print speed, acceleration, and part cooling capabilities** will be the ultimate factors in your success. You may find you need to print slower to maintain quality or that you can print even faster.

Please use these values as a reference. It is highly recommended that you print a few small test parts first to see if you need to adjust speeds or temperatures for your specific printer and filament.

Part cooling was set to 100% for Every part

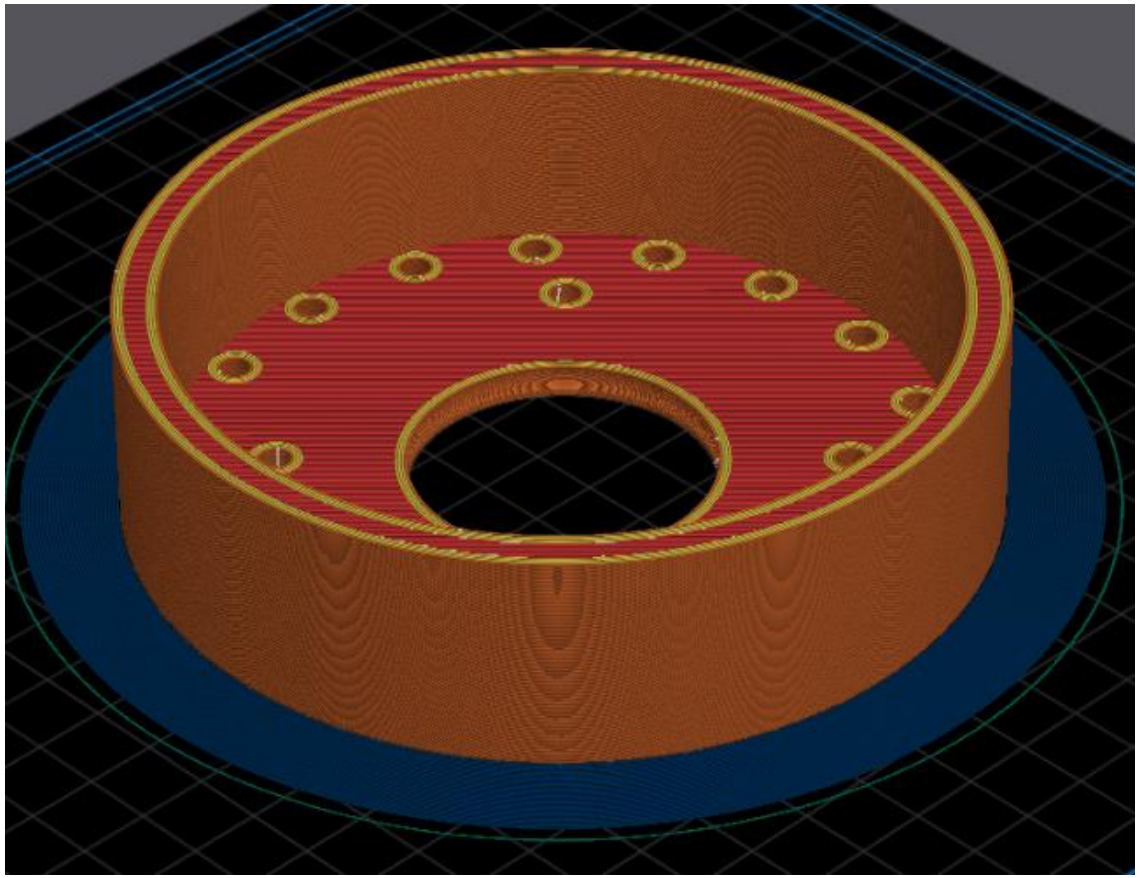
Filament Settings

The following settings were calibrated for a specific 3D printer using Elegoo Rapid PETG filament. It is important to note that these values, especially for temperature and flow, will likely vary between different printer models, hotends, and even different batches of filament. They are provided here as a reference point for a successfully tuned profile.

- **Nozzle Temperature:** 265°C This temperature was used for both the initial layer and the remainder of the print. Notably, this is higher than the typical manufacturer-suggested range for this filament (245-250°C) and was chosen to promote strong layer adhesion and a high-gloss, transparent finish. This setting may need to be lowered for printers with PTFE-lined hotends.
- **Bed Temperature:** 70°C A consistent bed temperature of 70°C was used to ensure reliable first-layer adhesion and to minimize the risk of warping on larger prints.
- **Flow Ratio:** 92.8% (0.927675) The extrusion flow was calibrated to this specific value to achieve dimensional accuracy and prevent over-extrusion with this particular filament and extruder setup. Almost every printer requires some degree of flow calibration, so this value is highly specific.
- **Maximum Volumetric Speed:** 18 mm^3/s A volumetric speed limit of 18 mm^3/s was established for this profile. This represents the maximum stable rate at which this specific hotend setup can melt this filament, acting as a performance cap to prevent under-extrusion at high print speeds.
- **Pressure Advance:** Enabled Pressure Advance was enabled in the printer's firmware to improve the quality of sharp corners and reduce extrusion artifacts. The specific coefficient for this setting is unique to the combination of the filament, extruder mechanics, and hotend, and requires separate calibration on any other machine.

Outer Housing (A) Settings

Setting	Value	Reason / Note
Walls/Perimeters	5	For strength & rigidity
Top/Bottom Layers	3	For solid top/bottom surfaces
Layer Height	0.2 – 0.24mm	Balances speed and quality
Infill Type	Gyroid	For multi-directional strength
Infill Density	30%-50%	Good strength, saves material
Print Speed	120mm/s	Baseline; reduce if quality suffers
Outer Wall Speed	100mm/s	For a clean surface finish
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	Brim	Recommended to prevent warping

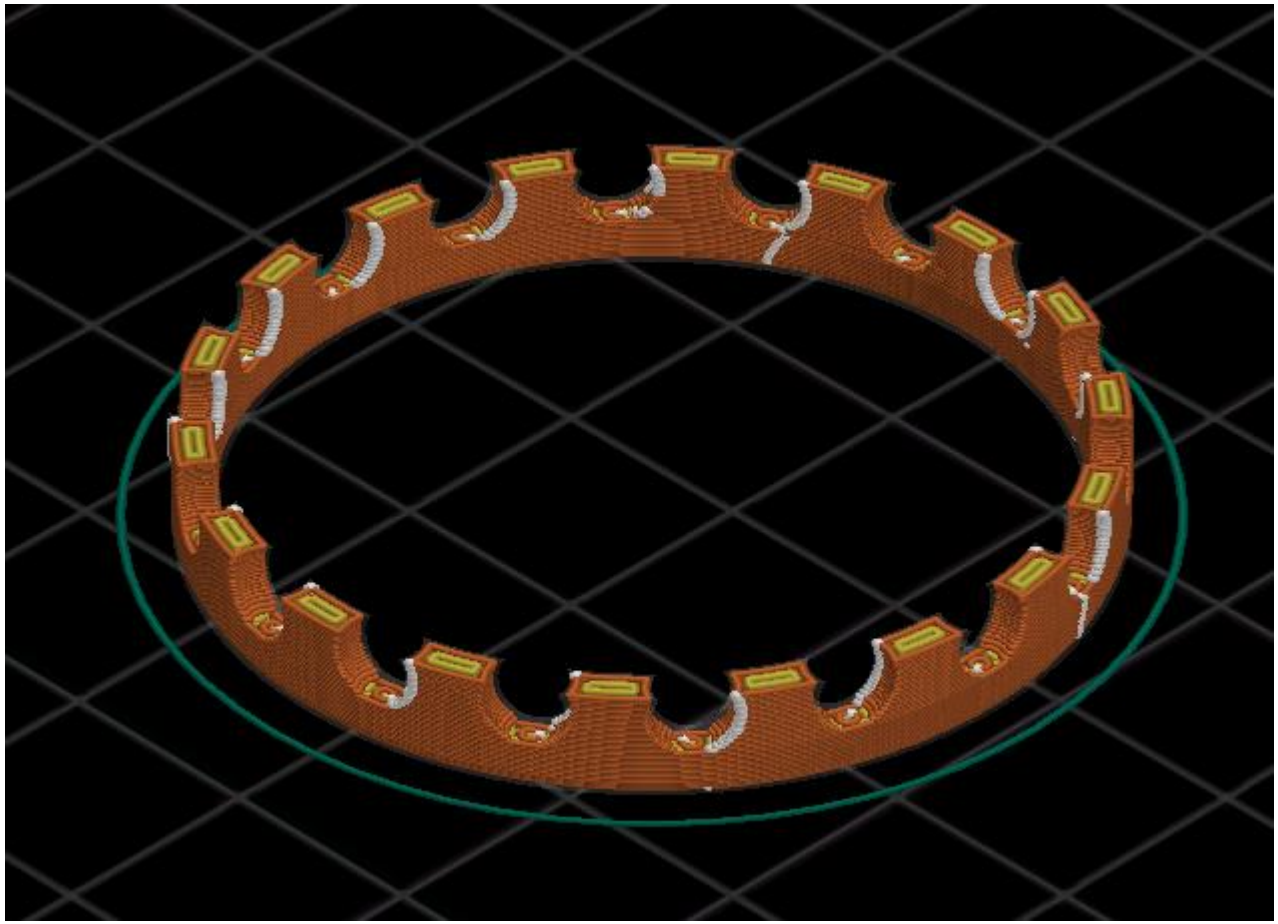


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces.
This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

A-B Bearing Cage Settings

Setting	Value	Reason / Note
Walls/Perimeters	2	Sufficient for a solid part
Top/Bottom Layers	2	Sufficient for a solid part
Layer Height	0.15 - 0.2mm	For high detail on small parts
Infill Type	N/a	Not applicable
Infill Density	N/a	Not applicable
Print Speed	40mm/s	Slow speed for accuracy
Outer Wall Speed	40 mm/s	Matches print speed for consistency
Travel Speed	120mm/s	Standard travel speed
Supports	No	Not needed
Adhesion Type	None	not needed

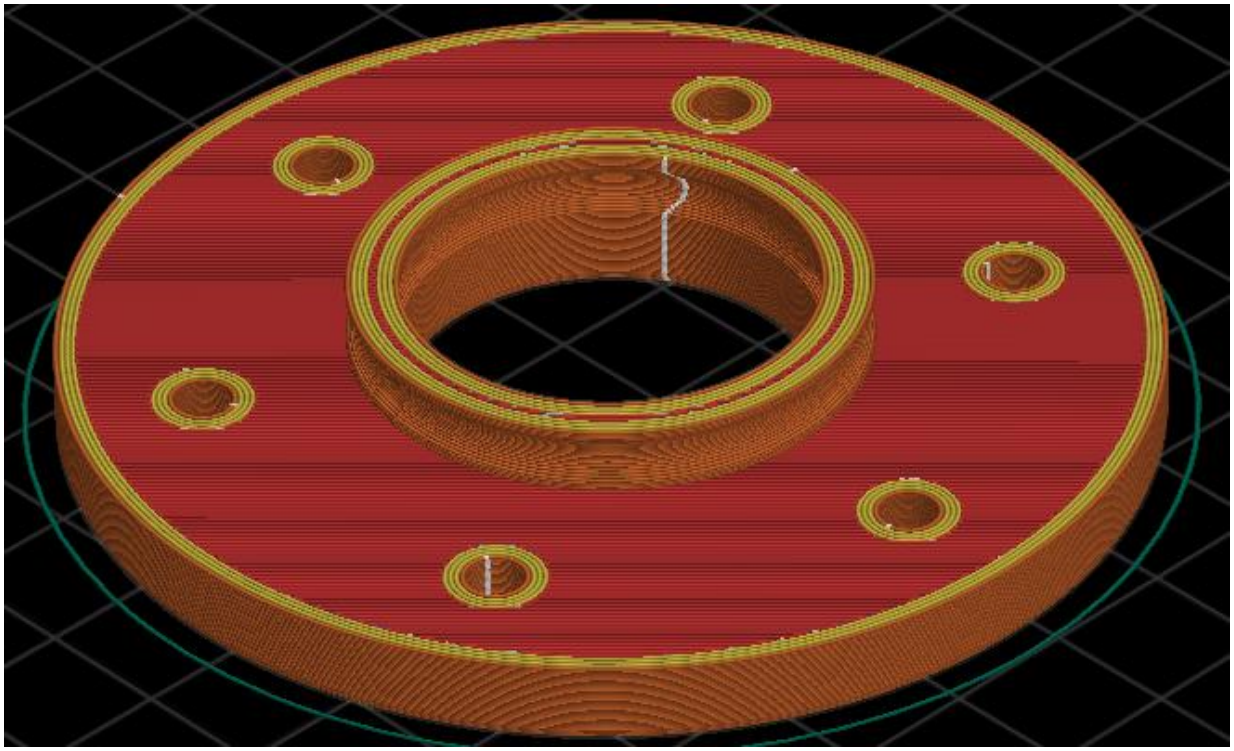


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces.
This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

(B) Bottom Output Flange Settings

Setting	Value	Reason / Note
Walls/Perimeters	4 or 5	For strength & durability
Top/Bottom Layers	3	For solid top/bottom surfaces
Layer Height	0.2 – 0.24mm	Balances speed and quality
Infill Type	Gyroid	Good multi-directional strength
Infill Density	30-40%	Strong, but saves material vs. solid
Print Speed	120mm/s	Baseline; lower for higher quality
Outer Wall Speed	100mm/s	Improves surface finish
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Sufficient bed contact area

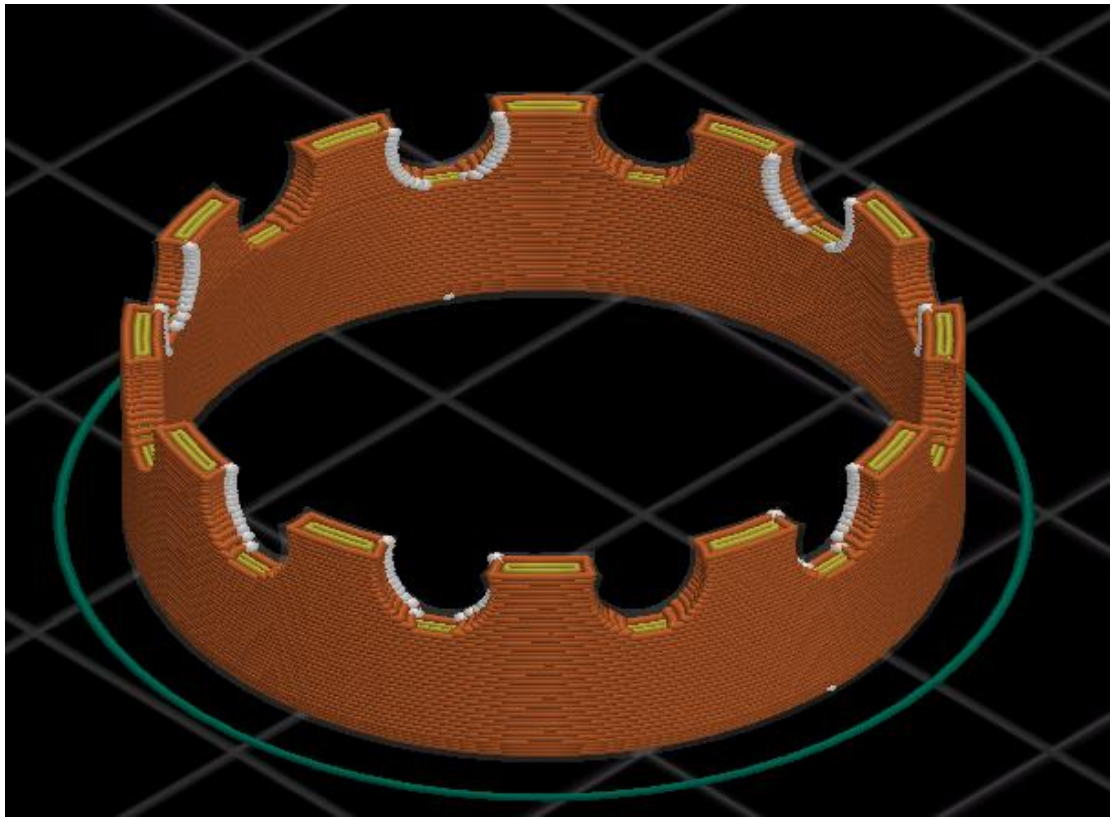


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces.
This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

B-C Bearing Cage Settings

Setting	Value	Reason / Note
Walls/Perimeters	2	Sufficient for a solid part
Top/Bottom Layers	2	Sufficient for a solid part
Layer Height	0.15 - 0.2mm	For high detail on small parts
Infill Type	Any	Not applicable at 100% infill
Infill Density	100%	To create a solid, strong part
Print Speed	40mm/s	Slow speed for high detail & accuracy
Outer Wall Speed	40 mm/s	Matches print speed for consistency
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Often not needed for small parts

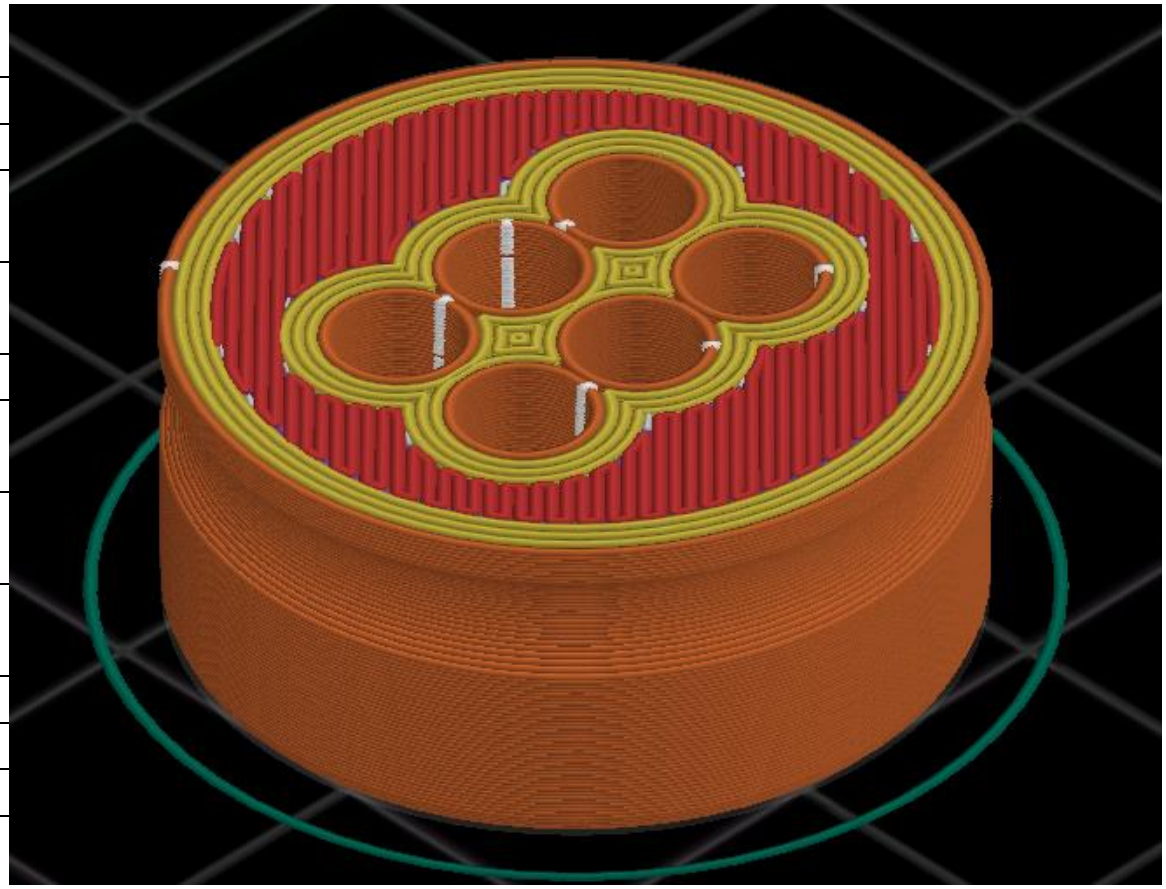


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces.
This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

C) Input Shaft Settings

Setting	Value	Reason / Note
Walls/Perimeters	4 or 5	High value strength
Top/Bottom Layers	3	Ensures solid, strong surfaces
Layer Height	0.10 - 0.16mm	Fine layers for high detail
Infill Type	Gyroid	Strong infill pattern
Infill Density	100%	Creates a completely solid part
Print Speed	120mm/s	Baseline; lower for higher quality
Outer Wall Speed	100mm/s	Improves surface finish at speed
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Sufficient bed contact area

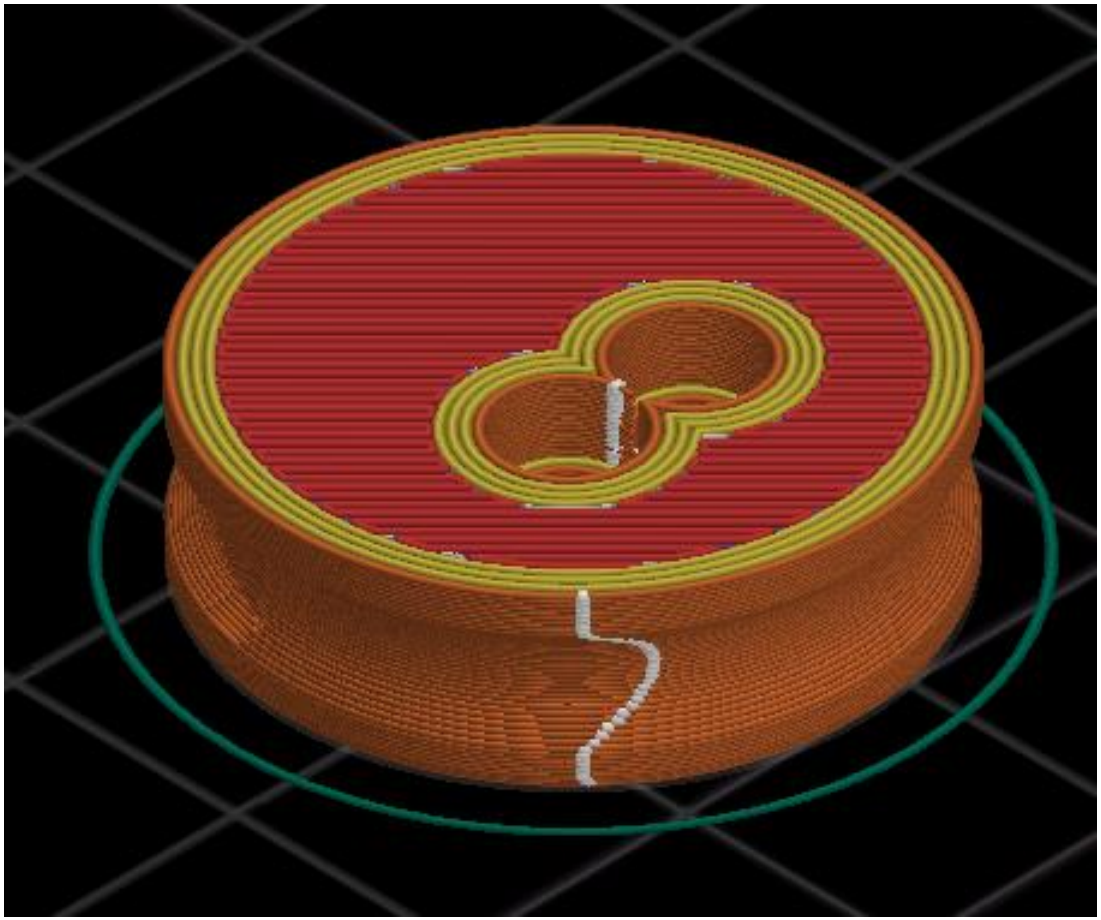


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

(D) Eccentric Shaft Settings

Setting	Value	Reason / Note
Walls/Perimeters	4 or 5	High value for maximum strength
Top/Bottom Layers	3	Ensures solid, strong surfaces
Layer Height	0.10 - 0.16mm	Fine layers for high detail
Infill Type	Gyroid	Strong infill pattern
Infill Density	100%	Creates a completely solid part
Print Speed	120mm/s	Baseline; lower for higher quality
Outer Wall Speed	100mm/s	Improves surface finish at speed
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Sufficient contact area

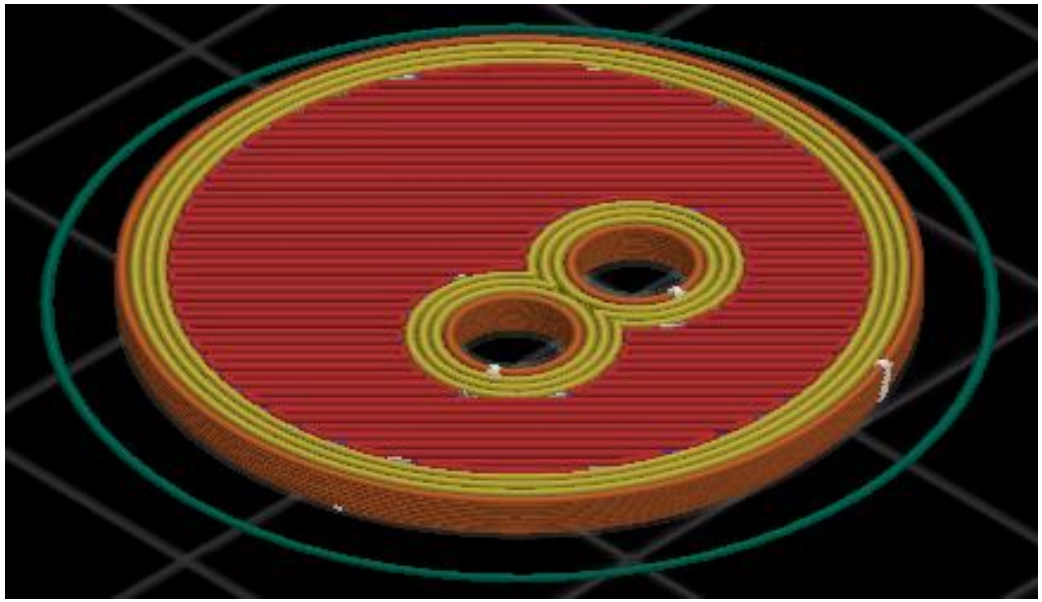


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

D-Spacer) Eccentric Shaft spacer

Setting	Value	Reason / Note
Walls/Perimeters	4 or 5	High value for maximum strength
Top/Bottom Layers	3	Ensures solid, strong surfaces
Layer Height	0.10 - 0.16mm	Fine layers for high detail
Infill Type	Gyroid	Strong infill pattern
Infill Density	100%	Creates a completely solid part
Print Speed	120mm/s	Baseline; lower for higher quality
Outer Wall Speed	100mm/s	Improves surface finish at speed
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Sufficient bed contact area

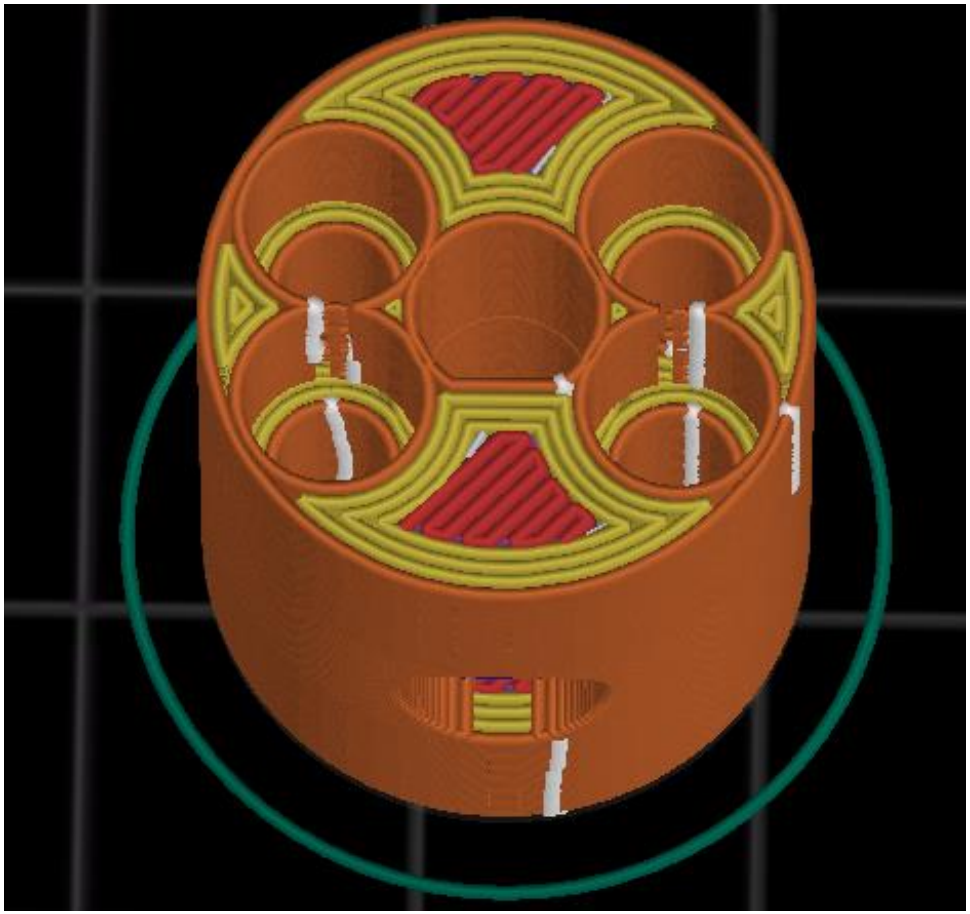


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces.
This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

E) Motor Shaft Coupler

Setting	Value	Reason / Note
Walls/Perimeters	4 or 5	High value for maximum strength
Top/Bottom Layers	3	Ensures solid, strong surfaces
Layer Height	0.10 - 0.16mm	Fine layers for high detail
Infill Type	Gyroid	Strong infill pattern
Infill Density	100%	Creates a completely solid part
Print Speed	120mm/s	Baseline; lower for higher quality
Outer Wall Speed	100mm/s	Improves surface finish at speed
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Sufficient bed contact area

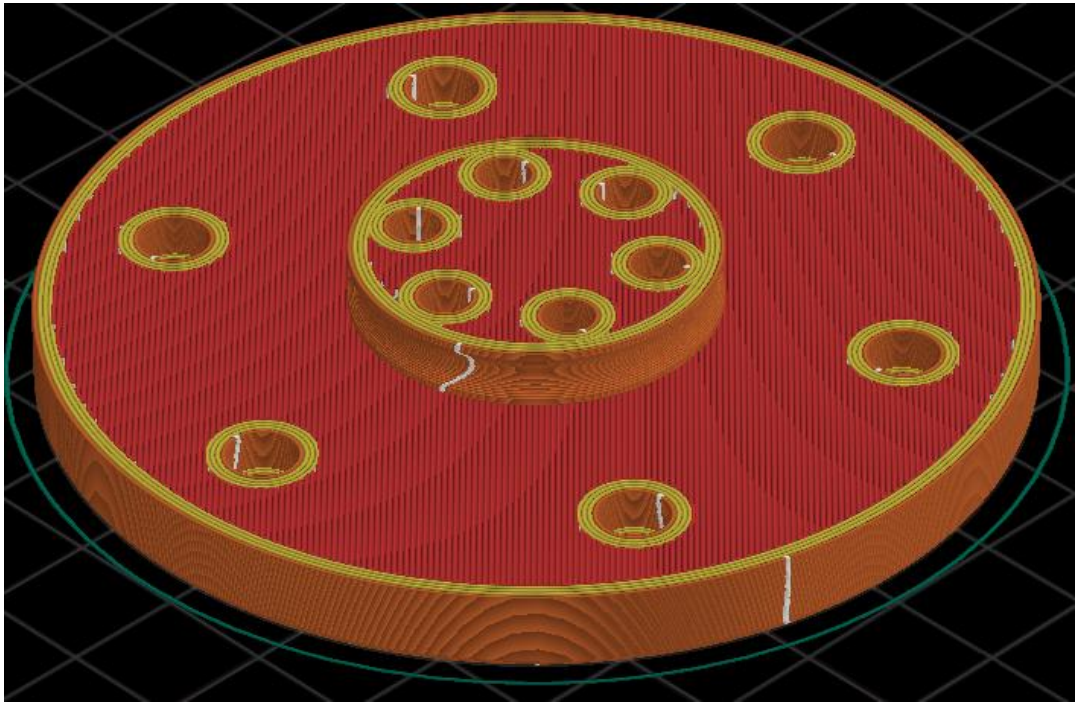


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

F) Top Output Flange

Setting	Value	Reason / Note
Walls/Perimeters	4 or 5	High value for strength & durability
Top/Bottom Layers	3	For solid top/bottom surfaces
Layer Height	0.20 - 0.24mm	Balances speed and quality
Infill Type	Gyroid	Good multi-directional strength
Infill Density	30-50%	Strong, but saves material vs. solid
Print Speed	120mm/s	Baseline; lower for higher quality
Outer Wall Speed	100mm/s	Improves surface finish
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Sufficient bed contact area



For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

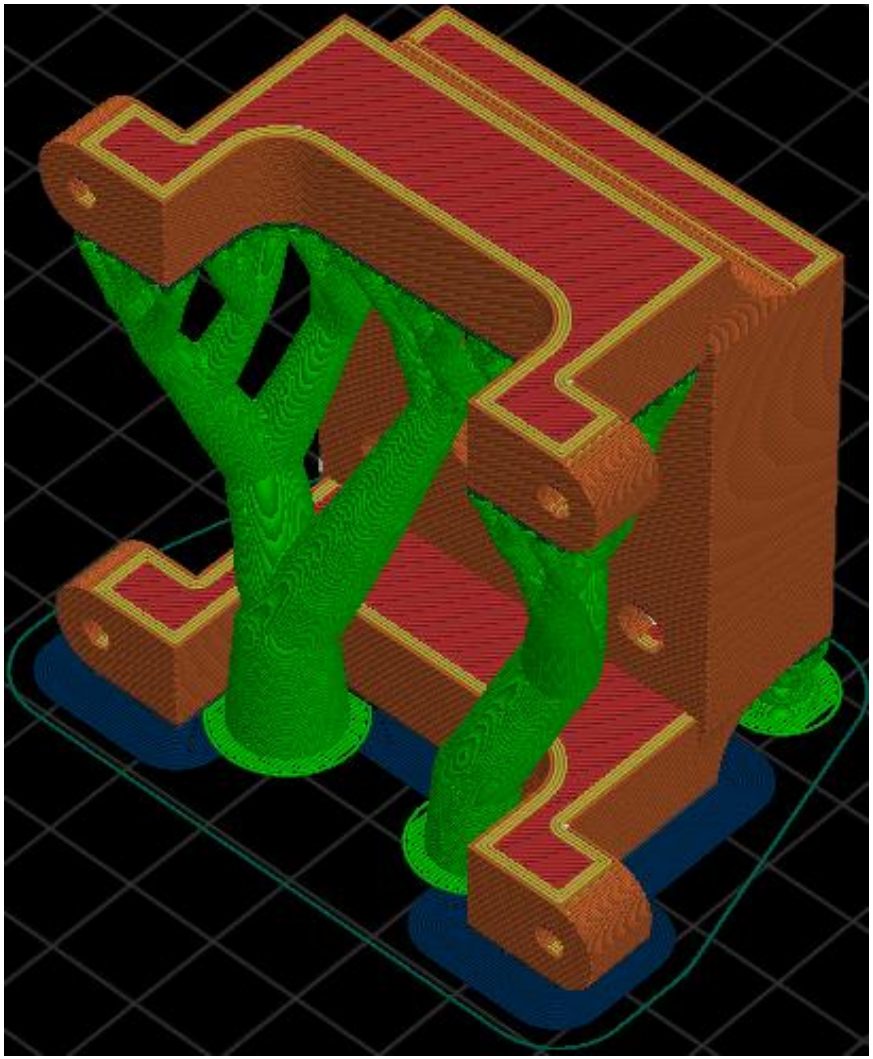
- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

G) Motor Mount

Setting	Value	Reason / Note
Walls/Perimeters	4 or 5	High value for strength & durability
Top/Bottom Layers	3	For solid top/bottom surfaces
Layer Height	0.20 - 0.24mm	Balances speed and quality
Infill Type	Gyroid	Good multi-directional strength
Infill Density	30-50%	Strong, but saves material vs. solid
Print Speed	120mm/s	Baseline; lower for higher quality
Outer Wall Speed	100mm/s	Improves surface finish
Travel Speed	120mm/s	Standard travel speed
Supports	Yes	Required for overhangs/bridges
Support Type	Tree	Efficient support for complex shapes
Support Placement	On Build Plate Only	Prevents supports on model surfaces
Adhesion Type	Brim	Improves bed adhesion & stability

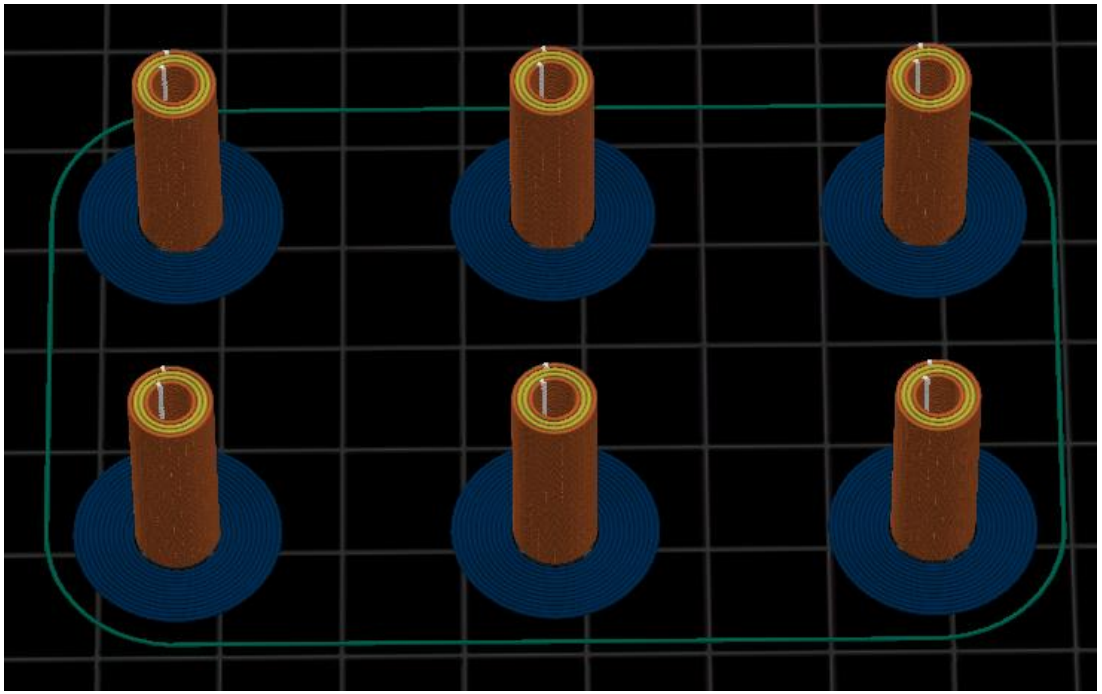
For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15



H-1) Output Bearing Shaft

Setting	Value	Reason / Note
Walls/Perimeters	4	Good strength for walls
Top/Bottom Layers	3	For solid top/bottom surfaces
Layer Height	0.10 - 0.2mm	Fine detail & quality focus
Infill Type	N/A	Not needed; part is solid from walls
Infill Density	N/A	Not needed; part is solid from walls
Print Speed	80mm/s	Moderate speed for quality
Outer Wall Speed	60mm/s	Improves surface finish
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Support Type	N/A	Supports not used
Adhesion Type	Brim	Ensures bed adhesion

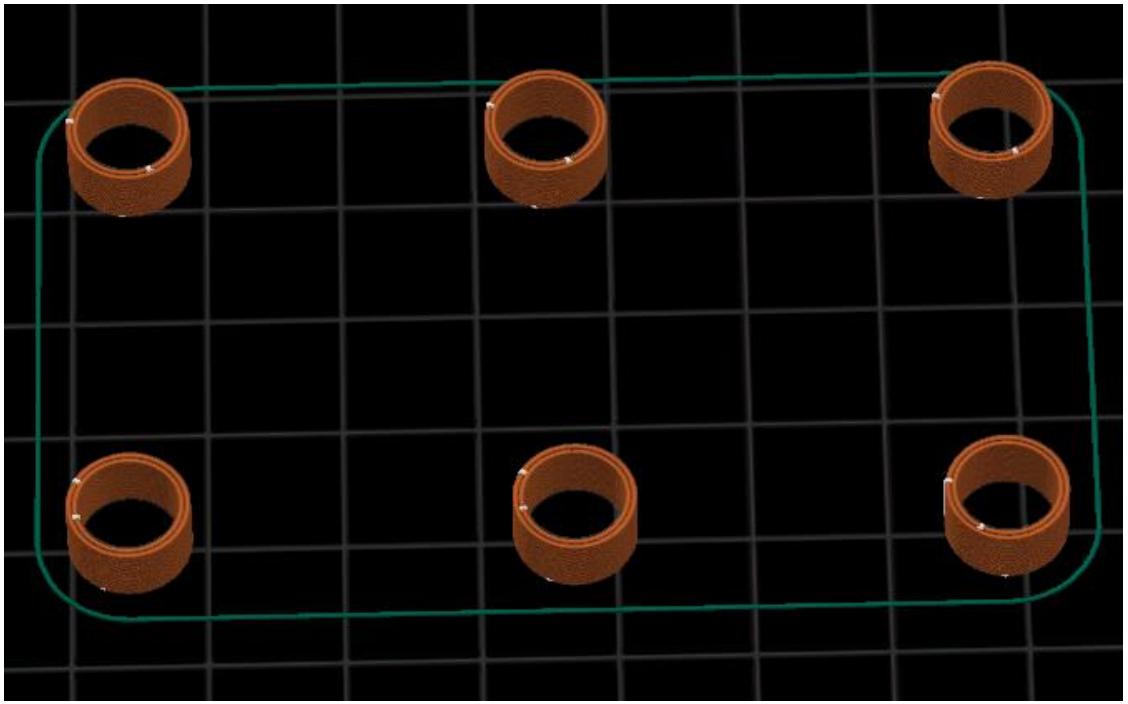


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

H-2) Output Bearing Spacer

Setting	Value	Reason / Note
Walls/Perimeters	2	Creates a solid part with no infill
Top/Bottom Layers	3	For solid top/bottom surfaces
Layer Height	0.10 - 0.2mm	Fine detail & quality focus
Infill Type	N/A	Not needed; part is solid from walls
Infill Density	N/A	Not needed; part is solid from walls
Print Speed	80mm/s	Moderate speed for quality
Outer Wall Speed	60mm/s	Improves surface finish
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Support Type	N/A	Supports not used
Adhesion Type	None	Sufficient contact area

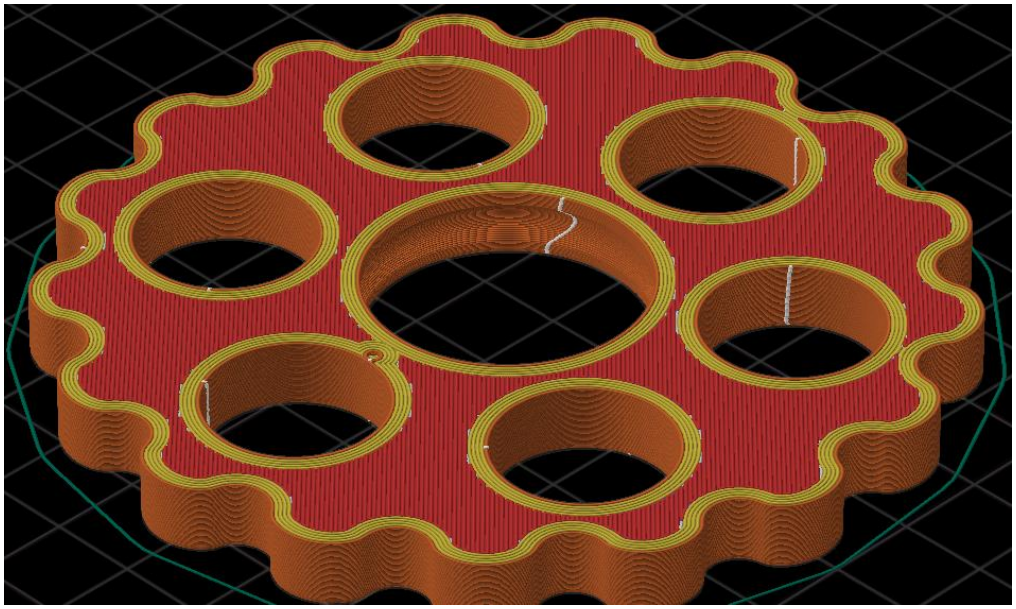


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

I) Cycloidal Disk

Setting	Value	Reason / Note
Walls/Perimeters	5	High value for maximum strength
Top/Bottom Layers	3	Ensures solid, strong surfaces
Layer Height	0.10 - 0.2mm	Good detail and surface finish
Infill Type	Gyroid	Good multi-directional strength
Infill Density	35-50%	Strong part with moderate infill
Print Speed	120mm/s	Baseline; lower for higher quality
Outer Wall Speed	100mm/s	Improves surface finish
Travel Speed	150mm/s	Fast travel to reduce print time
Supports	No	Part is self-supporting
Support Type	N/A	Supports not used
Adhesion Type	None	Sufficient bed contact area

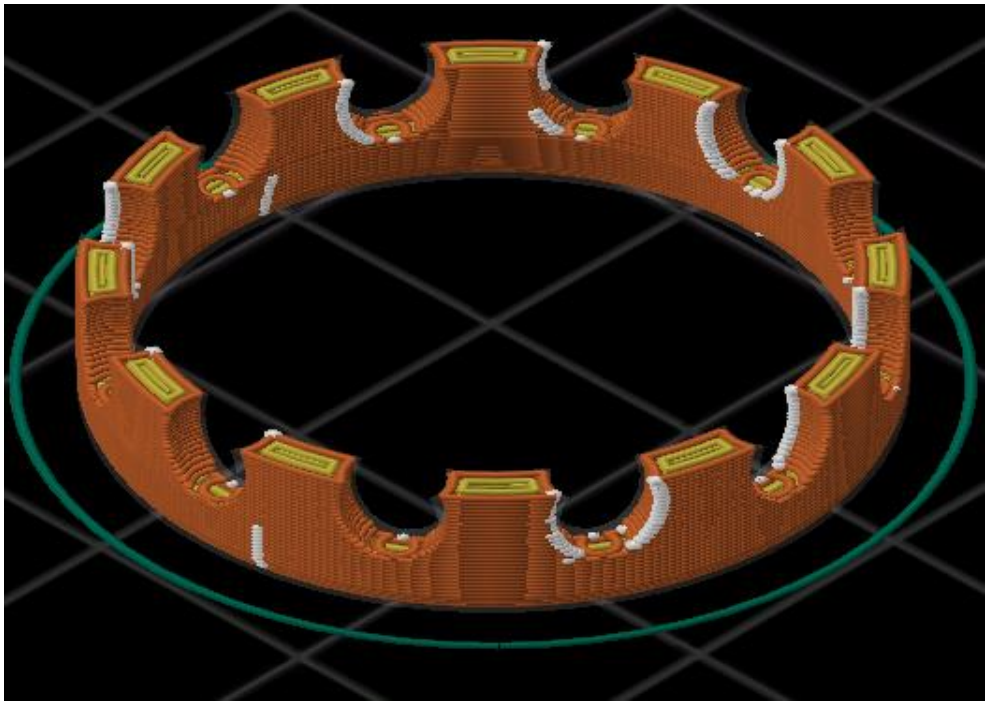


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

I-2) Bearing Cage Settings

Setting	Value	Reason / Note
Walls/Perimeters	2	Sufficient for a solid part
Top/Bottom Layers	2	Sufficient for a solid part
Layer Height	0.15 - 0.2mm	For high detail on small parts
Infill Type	Any	Not applicable at 100% infill
Infill Density	100%	To create a solid, strong part
Print Speed	40mm/s	Slow speed for high detail & accuracy
Outer Wall Speed	40 mm/s	Matches print speed for consistency
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Often not needed for small parts

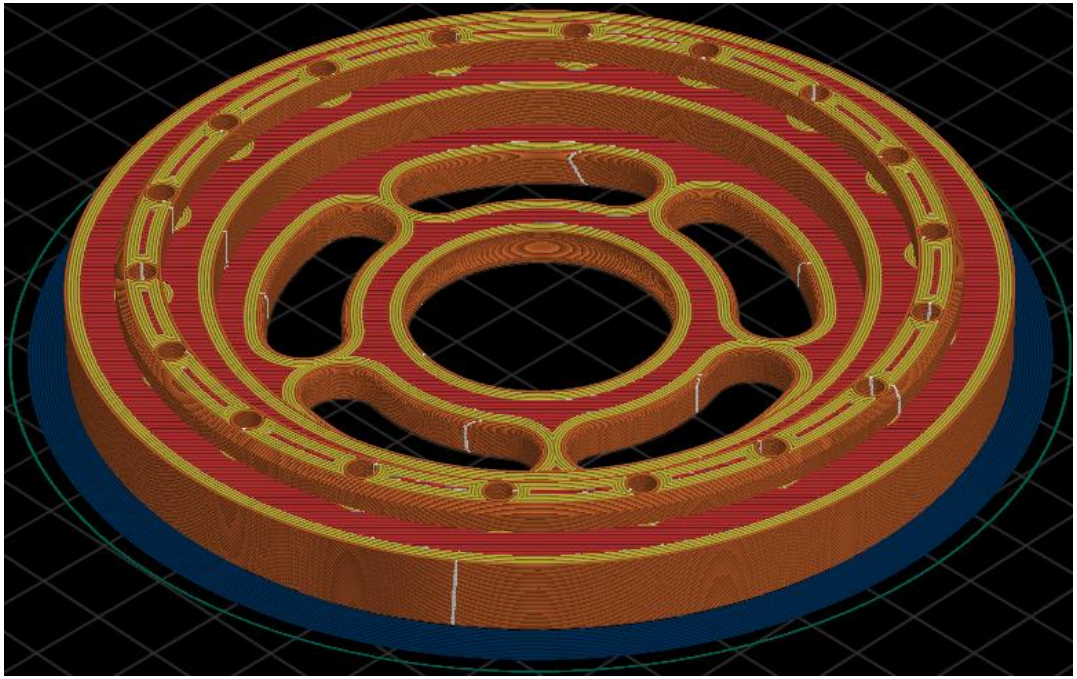


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

J-1) Outer Housing Settings

Setting	Value	Reason / Note
Walls/Perimeters	4 or 5	High value for strength & durability
Top/Bottom Layers	3	For solid top/bottom surfaces
Layer Height	0.2 - 0.24mm	Balances speed and quality
Infill Type	Gyroid	Good multi-directional strength
Infill Density	30-40%	Strong, but saves material vs. solid
Print Speed	120mm/s	Baseline; lower for higher quality
Outer Wall Speed	100 mm/s	Improves surface finish
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	Brim	to prevent warping

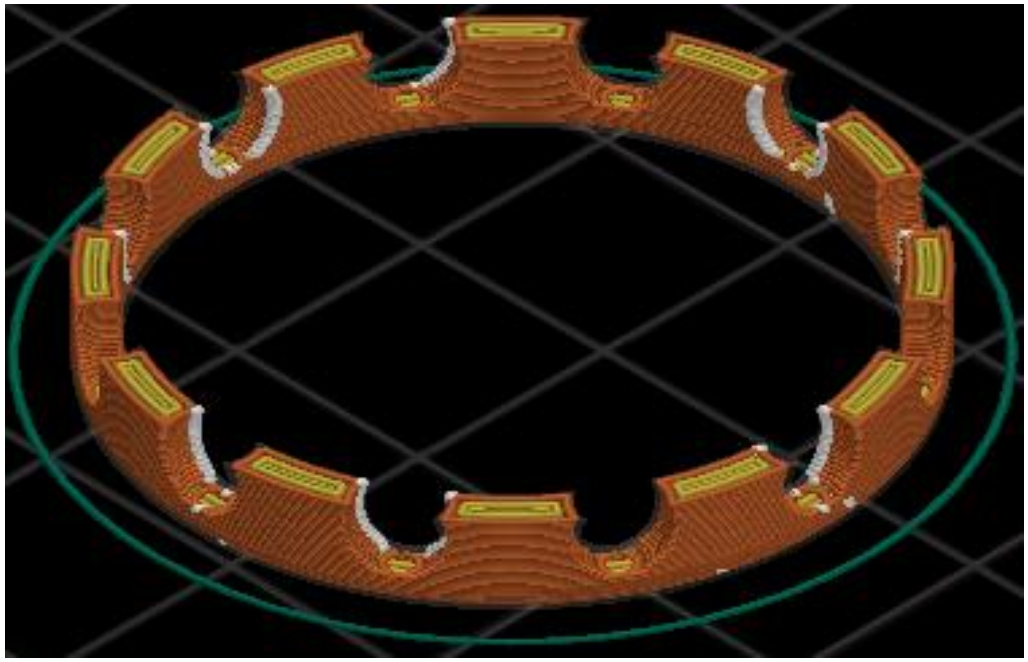


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

J-2) Bearing Cage Settings

Setting	Value	Reason / Note
Walls/Perimeters	3	Good strength for a solid part
Top/Bottom Layers	2	Sufficient for a solid part
Layer Height	0.15 - 0.2mm	For high detail on small parts
Infill Type	Any	Not applicable at 100% infill
Infill Density	100%	To create a solid, strong part
Print Speed	40mm/s	Slow speed for high detail & accuracy
Outer Wall Speed	40 mm/s	Matches print speed for consistency
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Often not needed for small parts

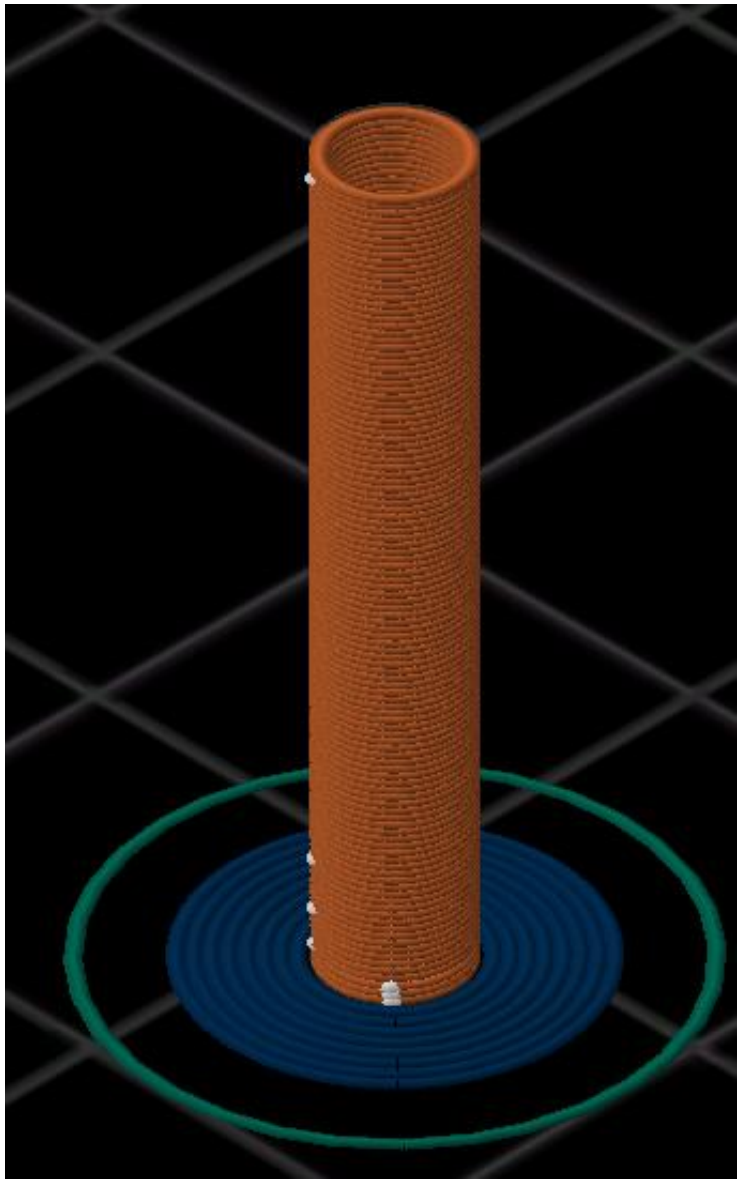


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces.
This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

Roller-A) Roller Shaft

Setting	Value	Reason / Note
Walls/Perimeters	1	Required for Vase Mode
Spiralise outer Contour	On (optional)	Vase Mode; creates hollow, seamless parts
Top/Bottom Layers	1	Only bottom layers are printed in Vase Mode
Layer Height	0.15 - 0.2mm	For a smooth surface finish
Infill Type	N/A	Disabled by Vase Mode
Infill Density	N/A	Disabled by Vase Mode
Print Speed	40mm/s	Slow, consistent speed for quality
Outer Wall Speed	40 mm/s	Matches print speed for consistency
Travel Speed	120mm/s	Standard travel speed
Supports	No	Vase Mode cannot use supports
Adhesion Type	None	Sufficient bed contact area

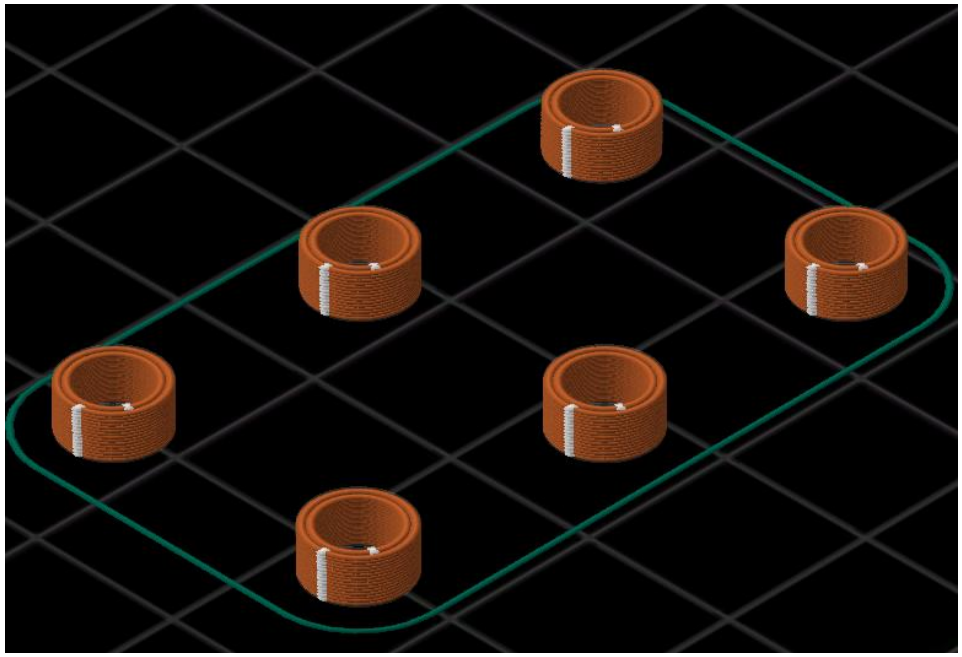


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

Roller-B) Roller Shaft Spacer Small

Setting	Value	Reason / Note
Walls/Perimeters	2	Creates a solid part with no infill
Top/Bottom Layers	2	Sufficient for a solid part
Layer Height	0.15 - 0.2mm	For high detail on small parts
Infill Type	N/A	Not needed; part is solid from walls
Infill Density	N/A	Not needed; part is solid from walls
Print Speed	40mm/s	Slow speed for high detail & accuracy
Outer Wall Speed	40 mm/s	Matches print speed for consistency
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Sufficient bed contact area

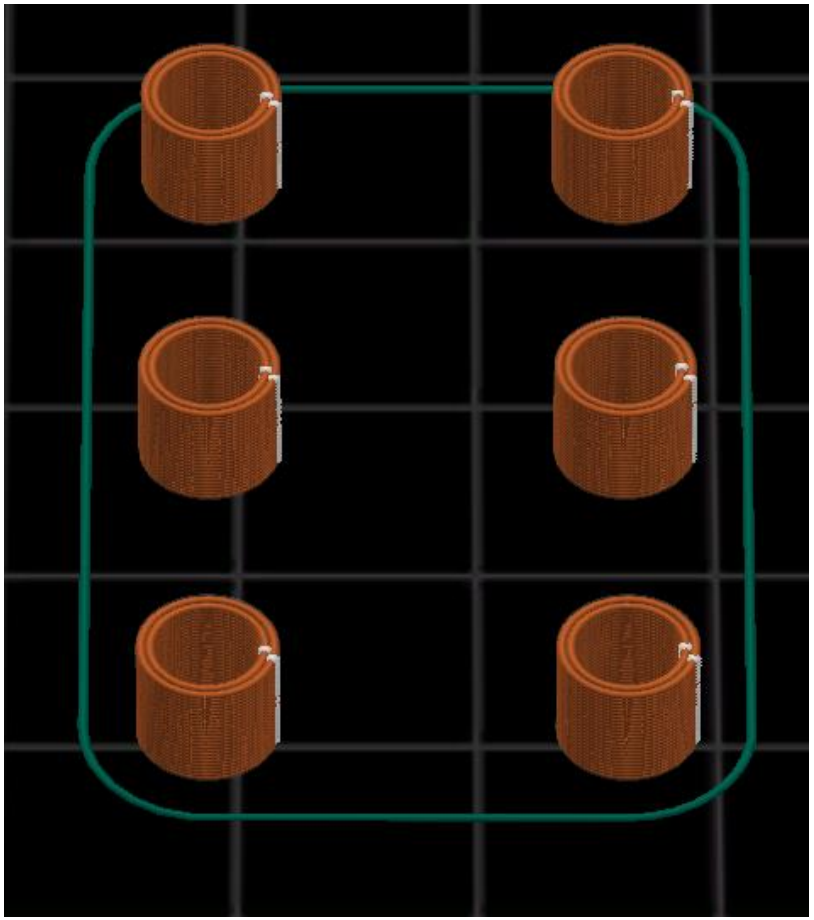


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces.
This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

Roller-C) Roller Shaft Spacer Medium

Setting	Value	Reason / Note
Walls/Perimeters	2	Creates a solid part with no infill
Top/Bottom Layers	2	Sufficient for a solid part
Layer Height	0.15 - 0.2mm	For high detail on small parts
Infill Type	N/A	Not needed; part is solid from walls
Infill Density	N/A	Not needed; part is solid from walls
Print Speed	40mm/s	Slow speed for high detail & accuracy
Outer Wall Speed	40 mm/s	Matches print speed for consistency
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	None	Sufficient bed contact area

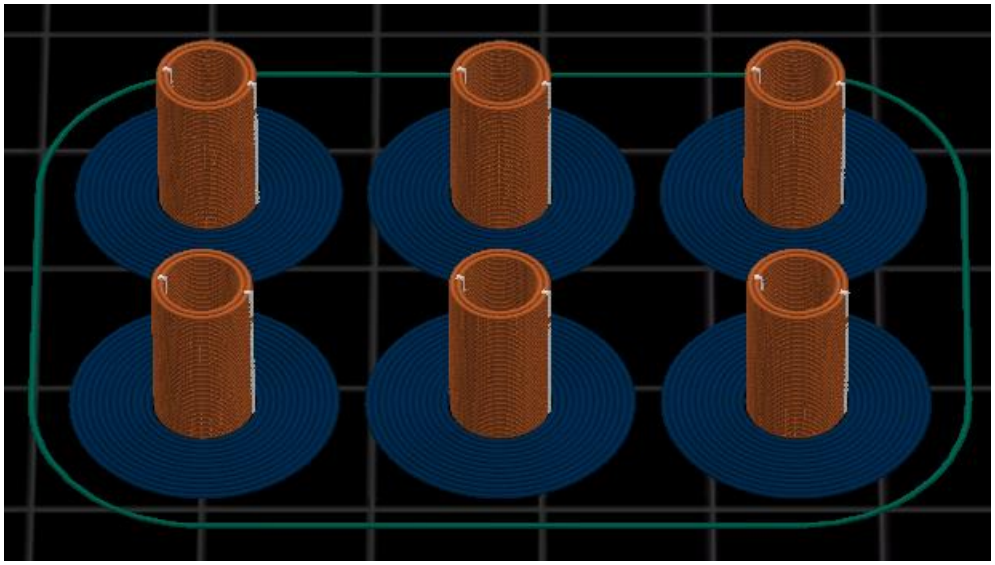


For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15

Roller-D) Roller Shaft Spacer Big

Setting	Value	Reason / Note
Walls/Perimeters	2	Creates a solid part with no infill
Top/Bottom Layers	2	Sufficient for a solid part
Layer Height	0.15 - 0.2mm	For high detail on small parts
Infill Type	N/A	Not needed; part is solid from walls
Infill Density	N/A	Not needed; part is solid from walls
Print Speed	40mm/s	Slow speed for high detail & accuracy
Outer Wall Speed	40 mm/s	Matches print speed for consistency
Travel Speed	120mm/s	Standard travel speed
Supports	No	Part is self-supporting
Adhesion Type	Brim	Improves bed adhesion for small parts



For users with slicers that support this feature, the following settings were used to create a less noticeable seam on contoured surfaces. This is an optional cosmetic enhancement.

- **Scarf Joint:** Contour and hole
- **Conditional Scarf joint:** Yes
- **Scarf Length:** 20mm
- **Scarf Steps:** 15