

Warping Troubleshooting Checklist

Work through the causes in order. Change one variable at a time.

- **Enclosure**
Confirm the printer is enclosed and protected from HVAC drafts, open doors and sudden temperature changes.
- **Warm-up**
Allow the bed and enclosure time to stabilize before starting a large ASA or ABS print.
- **Build surface**
Clean the plate and confirm that the surface is appropriate for ASA/ABS. Use glue or another approved adhesive/release layer when recommended.
- **Bed temperature**
Verify that the actual plate is reaching the recommended range. As a general start point, 90-105 °C works for many ASA and ABS setups; use the exact filament and build-surface guidance when available.
- **First layer**
Confirm nozzle-to-bed distance, line contact and coverage. Use a brim for long edges, sharp corners or large footprints when needed.
- **Cooling**
Keep part cooling low for most of the model. A general starting range is 0-20%; add more only where bridges or small features require it.
- **Nozzle temperature**
If layer bonding is weak, confirm the nozzle temperature is within the filament range before changing unrelated settings.
- **Geometry**
Long straight edges, sharp corners and large flat footprints concentrate shrinkage stress. Consider fillets, a brim, split parts or a different orientation.
- **Material condition**
If extrusion is rough, popping, unusually stringy or inconsistent, dry the filament according to grade-specific guidance.
- **Document the change**
Record what changed and what happened. If several variables change at once, the next print teaches very little.

Use exact filament settings and printer limits as the primary reference. This checklist organizes troubleshooting; it does not replace grade-specific guidance.