PRINT QUALITY TROUBLESHOOTING GUIDE

Not Extruding At Start:

Printer does not extrude plastic at the beginning of the print.

1. Extruder was not primed before beginning the print.
2. Nozzle starts too close to the bed.
3. The filament has stripped against the filament gear.
4. The extruder is clogged.

Print Not Sticking To The Bed:

The first layer does not stick to the bad and the print quickly fails.

1. Hot Bed is not level.
2. Nozzle starts too far away from the bed.
3. First layer is printing too fast.
4. Temperature or cooling settings.
5. The Hot Bed surface (tapes, glues, sprays, material)
6. When all options fail: Use brims and rafts.

Under-Extrusion:

Printer does not extrude enough plastic, gaps form between perimeters and infill.

1. Incorrect filament diameter.
2. Increase flow multiplier.

Over-Extrusion:

Printer extrudes too much plastic, prints look very messy.

1. Decrease flow multiplier.

Gaps in Top Layer:

Holes or gaps appear in the top layer of the print.

1. Not enough top solid layers
2. Infill percentage is too low.
3. Under-Extrusion.

Stringing or Oozing

Lots of strings and hairs left behind when moving between different sections of the print.

1. Retraction distance.
2. Retraction speed.
3. Temperature is too high
4. Long movements over open spaces.
5. Movement speed.

Overheating

Small features become overheated and deformed.

1. Insufficient cooling.
2. Printing at too high a temperature.
3. Printing too fast.
4. When all else fails: Try printing multiple parts at once.

Layer Shifting or Misalignment

Layers are misaligned and shift relative to each other.

1. Main Block is moving too fast.
2. Mechanical or Electrical issues.

Layer Separation and Splitting

Layers are separating and splitting apart while printing.

1. Layer height is too large.
2. Print temperature is too low.

Grinding Filament

Plastic is being ground away until the filament no longer moves, otherwise known as 'stripped' filament.

1. Aggressive retraction settings
2. Increase the extruder temperature.
3. Printing too fast.
4. Check for a clogged nozzle.

Clogged Extruder

Extruder is clogged or jammed and will no longer extrude plastic from the nozzle.

1. manually push the filament through the extruder.
2. Reload the filament.
3. Clean out the nozzle.

Stops Extruding Mid Print

Printer stops extruding plastic randomly in the middle of a print.

1. Out of filament.
2. The filament has stripped against the filament gear.
3. Thick piece of filament unable to pass through extruder.
4. The extruder is clogged.
5. Over heated extruder motor driver.

Weak infill

Very thin, stringy infill that creates a weak interior and does not bond together well.

1. Try alternate infill patterns.
2. Lower the print speed.
3. Increase the infill extrusion width.????

Blobs and Zits

Small blobs appear on the surface of prints also know as zits.

1. Avoid unnecessary retractions

Gaps Between Infill and Outline

Gaps between the outline of the part and the outer solid infill layers.

1. Not enough infill overlap.
2. Printing too fast.

Curling or Rough Corners

Corners of the print tend to curl and deform after they are printed, typically due to overheating.

1. See Overheating.
2. See Print not sticking to bed (If occurring on the early layers).

Scars on Top Surface

The nozzle scrapes across the top of the print and creates a scar on the surface.

1. Extruding too much plastic.
2. Try Vertical lift (Z-Hop).

RS Pro iTX 3D Printer

Gaps in Floor Corners

Gaps in the corners of the print, where the top layer does not join to the perimeter of the next layer.

1. Not enough perimeters
2. Not enough top solid layers.
3. Infill percentage is too low.

Lines on the Side of Print

Side walls are not smooth, lines are visible on the side of the print.

1. Inconstant extrusion due to poor quality filament.
2. Temperature variation
3. Mechanical issues (Vibration)

Vibrations and Ringing

Vibrations that cause oscillations on the surface of the print, otherwise known as 'ringing'

1. Printing too fast.
2. Firmware acceleration.
3. Mechanical issues

Gaps in Thin Walls

Gaps between thin walls of the print where the perimeters do not touch.

1. Change nozzle diameter to fit better.

Small Features Not Printed

Very small features are not printed or are missing from the software preview.

1. Change nozzle diameter to fit better.
2. Redesign the part to have thicker features.

Inconsistent Extrusion

Extrusion amount tends to vary and is not consistent enough to produce an accurate shape.

1. Filament is stuck or tangled.
2. Clogged extruder.
3. Too low layer height.
4. Incorrect extrusion width.
5. Poor quality filament.
6. Mechanical extruder issues.

Warping

Warping of large parts, particularly with high temperature materials such as ABS.

1. Increase Hot Bed temperature.
2. Disable fan cooling.
3. Use a heated enclosure.
4. Add a brim or raft.

Poor Surface Above Supports

Poor surface quality on the underside of the part where it touches the support structure.

1. Reduce the layer height.
2. Increase support infill percentage.
3. Adjust Distance Z from print.
4. Adjust Distance XY from print.

Dimensional Accuracy

Dimensional issues where the measured dimensions do not match the original design intent.

1. **Impact of first layer dimensional accuracy.**
2. **Under or Over Extrusion.**
3. **Adjust original part size.**

Poor Bridging

Sagging, drooping, or gaps between the extruded segments of your bridging regions.

1. **Check Filament printing temperature is comparable with material being printed**