

1. OPTIMAL THERMAL PROFILES & BED TEMPERATURES (PEI PLATES)

Filament Type	Nozzle Temp (C)	Bed Temp (PEI)	Part Fan Speed	Critical Slicer Notes
PLA / PLA+	200 - 215 C (First: 215 C)	55 - 60 C	100% (after layer 2)	Enclosed printers: crack top lid / door open
PETG / PETG-CF	235 - 250 C	70 - 80 C	30% - 50% max	Avoid high fan (causes weak layer bonding)
TPU 95A / Flex	220 - 235 C	45 - 55 C	50% - 80%	Slow speed (25-40 mm/s), disable retraction
ABS / ASA	245 - 265 C	95 - 105 C	0% - 15% max	Chamber enclosure required to stop warping

2. RETRACTION & ANTI-STRINGING SPEED MATRIX

Direct Drive Extruders (Bambu P1S/X1C/A1, Creality K1/Ender 3 V3, Prusa MK4) Retraction Distance: 0.6mm - 1.2mm Retraction Speed: 35 - 45 mm/s Z-Hop / Lift on Retract: 0.2mm - 0.4mm (Spiral / Slope)	Bowden Tube Extruders (Ender 3 Classic/V2, Anycubic Kobra Go/Neo, Sovol SV06) Retraction Distance: 4.5mm - 6.0mm Retraction Speed: 40 - 50 mm/s Wipe While Retracting: Enabled (1.5mm - 2.0mm)
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3. THE 5-MINUTE FIRST-LAYER FIX PROTOCOL

- Step 1: Strip Finger Oils & Contaminants

Wash textured PEI sheet with warm water and standard dish soap (Dawn/Fairy). Wipe dry with clean microfibre.
- Step 2: Z-Offset Micro-Tuning

- Gaps between extrusion lines / rounded bead = NOZZLE TOO HIGH -> Lower Z-offset by -0.04mm

- Rough plastic ridges / nozzle scraping PEI = NOZZLE TOO LOW -> Raise Z-offset by +0.03mm
- Step 3: Initial Layer Slicer Speeds

Set initial layer speed to 20 - 25 mm/s. Initial layer infill: 35 - 45 mm/s max. Disable part cooling fan on layer 1.

4. MAX VOLUMETRIC FLOW SPEED LIMITS (OrcaSlicer / Bambu Studio)

Standard Brass V6 Nozzle: 12 - 15 mm3/s | Bambu / Volcano Hotend: 22 - 28 mm3/s | High-Flow CHT: 32 - 38 mm3/s

Speed Formula: $\text{Max Print Speed (mm/s)} = \text{Max Volumetric Flow (mm3/s)} / [\text{Layer Height (mm)} \times \text{Line Width (mm)}]$

Got a Failed Print Right Now? Diagnose It With AI in 10 Seconds

Doctor 3D UK uses advanced computer vision to analyze photos of your failed 3D prints, pinpoint root causes (stringing, under-extrusion, warping, VFA), and generate exact slicer tuning fixes.

TRY FREE SCAN -> <https://doctor-3d.uk>

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