ULTIMATE 3D PRINT FILE PREP GUIDE

Preparing your files properly is the most effective way to reduce print failures, speed up lead times, and ensure your parts are produced accurately. This guide walks you through best practices for submitting STL and STEP files for FDM 3D printing - helping you get the results you need, first time.

FILE FORMAT OVERVIEW

• **STL (Stereolithography) -** The most common format for 3D printing. Represents the surface geometry of your part using triangles. Ideal for direct-to-print submissions. Note: STL files do not contain scale, units, or editable CAD features.

• **STEP (Standard for the Exchange of Product Data) -** A CAD-neutral format ideal for sharing design intent. STEP files retain solid bodies and allow for design modifications. Best used when further adjustments, assemblies, or engineering feedback are expected.

3D PRINT FILE SUBMISSION CHECKLIST

Use this checklist to ensure your files are ready for manufacturing:

✓ **Units & Scale:**
- Confirm the file is exported in millimetres (mm).
- Ensure your model is correctly scaled – a common STL issue.

✓ **Naming Conventions:**
- Use clear, descriptive file names (e.g. 'Mounting_Bracket_V4.STL').
- Include version control if multiple iterations are being sent.

✓ **File Type Suitability:**
- Use STL for ready-to-print parts.
- Use STEP for assemblies or when design collaboration is needed.

✓ **Print Orientation:**
- Orient the part to minimise supports and maximise strength.
- Flat surfaces should ideally be aligned with the print bed.

✓ **Wall Thickness:**
- Ensure walls are no thinner than 0.8–1.2 mm for standard FDM prints.
- Thin sections may warp, delaminate or not print at all.

✓ **Tolerances & Fits:**
- Indicate if parts should fit together or interact with other components.
- For functional fits (clearance/interference), include tolerances or a drawing.

✓ **Overhangs & Supports:**
- Flag areas needing support or if support should be avoided.
- Consider chamfering edges or breaking models into parts to reduce support.

✓ **Manifold Geometry:**
- Check that your model is 'watertight' – no holes, inverted normals, or intersecting faces.
- Non-manifold models cannot be printed without repair.

✓ **Internal Features:**
- Ensure that holes, channels, and recesses are appropriately sized for your print method.
- Holes below 1.5 mm may not resolve cleanly.

✓ **STL Resolution:**
- Export with a fine enough mesh to preserve curved surfaces, but avoid unnecessarily large files.
- A good balance: small angle tolerance and low chord height.

✓ **STEP File Cleanup:**
- Remove unused sketches, construction planes, and hidden features before export.
- Flatten assemblies if possible, or include an assembly drawing.

PRINT ORIENTATION MATTERS

Layer direction significantly impacts part strength and surface quality. Parts are weakest along the Z-axis where layers bond.
- Place flat faces against the build plate where possible.
- Avoid tall, unsupported features.
- If unsure, we can help determine the best orientation for your application.

RECOMMENDED FITS & TOLERANCES

Use these as a starting point for FDM parts:

FIT	Tolerance	Use examples
Loose Fit	0.5–1.0 mm	Snap-fit lids, general clearance
Sliding Fit	0.2–0.4 mm	Removable inserts, guides
Tight/Press Fit	0.1–0.2 mm	Interlocking or push-fit features

Threads & Inserts

- Threads under M6 should be tapped post-printing for best reliability.
- Use heat-set inserts for durable, reusable threads in plastic parts.
- Ask us for insert compatibility or let us fit them during post-processing

Material Behaviours to Consider

- PLA is stiff but brittle – avoid for parts that flex.
- PETG is impact resistant and a great all-rounder.
- Nylon is flexible and abrasion resistant, ideal for clips or tool holders.
- Avoid PLA for snap fits or load-bearing clips – use PETG or Nylon instead.

Preflight Tools & Tips

- Use **Netfabb** or **Microsoft 3D Builder** to repair STL files.
- Preview parts in **Cura** or **PrusaSlicer** to check support generation and layer view.
- Avoid STL files larger than necessary – use a balanced resolution export.

Top 3 Ways to Impress Your Printer (That's Us!)

1. Submit one file per part – avoid combining multiple parts in a single STL.
2. Use a ZIP folder with clear names and a short readme if sending many files.
3. Include key info: quantity, material preference, and delivery deadline.

COMMON FILE ISSUES (AND FIXES)

Mistake: Model is too small or too large
Fix: Check export units - always use millimetres (mm)

Mistake: Walls too thin to print
Fix: Use section view to verify wall thickness ≥ 0.8 mm

Mistake: Non-manifold geometry
Fix: Run file through Netfabb or ask us to check it

Mistake: Missing tolerances or notes for mating parts
Fix: Include a reference drawing or written notes with submission

Submitting Files to The 3D Printers
You can upload your files through our enquiry form or email us directly at **hello@the3dprinters.co.uk.**

We accept STL and STEP formats. If you're unsure which format to send or want us to check your file before quoting, just ask - we're happy to help.
You can call us on 01233 556 055