



## A3D – 008 – FFF/FDM

### Introduction

Welcome to A3D Manufacturing's guide to Fused Filament Fabrication (FFF) or Fused Deposition Modeling (FDM) 3D printing. Our technology combines extensive build volumes and a wide array of specialized materials to suit your project's needs—from medical and aerospace to everything in between. Below, we outline the expectations and limitations of our FFF/FDM 3D printing technology.

### Technology Overview - How It Works

1. CAD File Preparation: A CAD file is processed into slices using specialized software.
2. Material Selection: Two types of materials are used—support material and part material.
3. Printing Process: The printer heats the filament and extrudes it layer-by-layer based on the sliced CAD file.
4. Support Removal: Once the part is complete, the support material is removed manually or through a solution.

### Common Applications

- Manufacturing aids: jigs, fixtures, drill guides, etc.
- Large, flat parts
- Applications requiring thermoplastic functionality.
- Robust prototypes

### Material Options

Nylon materials like PA12 or Nylon PA6 with carbon fiber. High-Grade engineering plastics such as Ultem, and lower grade materials for prototyping such as ASA, ABS and PETG.

Continuous Fiber Composite: Materials like Carbon Fiber, Kevlar, HSHT Fiberglass, and Fiberglass can be integrated into a composite base for metal-strength parts.

From the Metal-X: 17-4PH Stainless Steel, Copper, H13 Tool Steel, Inconel625, A2 & D2 Tool Steel

### Expectations

**Lead Time** Standard: 3 – 4 days

**Expedited:** As early as next day

**Standard Accuracy Layer Thickness:** 50-200 microns (varies by material)

**Build Volumes:** Composite Printer: 330x270x200mm (XYZ)

**Finishes** Depending on the material, finishes can include painting, inserts, or vapor smoothing.



### Minimum Specifications

**Wall Thickness:** 1.016mm (0.040") (dependent on material and nozzle size)

**Clearance for Assemblies:** 0.508mm (0.020")

**Feature Size:** 0.508mm (0.020") (dependent on layer height)

**Hole Diameter:** X/Y Axis: 1.524mm (0.060"), Z Axis: 1.016mm(.040")

**Unsupported Overhang Angle:** The minimum angle for unsupported overhangs is 40 degrees.

**Composite Limitations:** Continuous fibers can't be used alone; they must be integrated into a composite base material.

At A3D Manufacturing, we strive to meet your 3D printing needs across multiple sectors. This guide aims to set the right expectations while informing you of the limitations of our FFF/FDM 3D printing technology. Feel free to reach out for any further queries.

Thank you for considering A3D Manufacturing for your 3D printing needs.