

## Fused Deposition Modeling Filament Information

### Engineering Deal Filaments Highlighted in Maroon

#### ABS - Acrylonitrile Butadiene Styrene

- Temperature: 230±10°C
- Strong, ductile
- Wear and heat resistant
- Bed: 90±10°C
- Good for post-processing
- ***Produces toxic fumes, ventilation required***

#### ASA - Acrylonitrile Styrene Acrylate

- Temperature: 250±10°C
- UV, weather, wear, and temperature resistant
- Bed: 90±10°C
- Good for outdoor use
- ***Produces toxic fumes, ventilation required***

#### HIPS - High Impact Polystyrene

- Temperature: 230±10°C
- Strong, durable, non-toxic, impact resistant, and recyclable
- Food safe and machinable
- Bed: 50±10°C
- Works with adhesives and paint
- Dissolves in limonene

#### PETG - Polyethylene Terephthalate (Glycol)

- Temperature: 245±10°C
- Durable, flexible
- Impact and heat resistant
- Bed: 60±10°C
- Good for snap fit and mechanical parts

#### PETG - Carbon Fiber PETG

- Temperature: 245±10°C
- Increased durability and strength
- High Impact and heat resistance
- Increased PETG Stiffness
- Bed: 60±10°C
- Good for snap fit and mechanical parts
- Chemical resistant

#### PLA - Polylactic Acid

- Temperature: 210±10°C
- Stiffer material, can be brittle
- Low melting point
- Bed: 0-40±15°C
- Non-toxic, easy to use
- Heated bed not required

### PLA - High Heat PLA

- Temperature:  $210 \pm 10^{\circ}\text{C}$
- Stiffer material, can be brittle
- Can heat treated (annealed) to achieve properties exceeding ABS
- To anneal, bake model in  $200^{\circ}\text{F}$  oven for up to 30 minutes
- Bed:  $0-40 \pm 15^{\circ}\text{C}$
- Non-toxic, easy to use
- Annealing works best on solid (100% infill parts)
- Depending on model properties, annealing can cause part to deform or shrink

### PLA - Composite Brass, Bronze, Copper PLA

- Temperature:  $220 \pm 10^{\circ}\text{C}$
- PLA properties
- Look and feel of bronze, brass or copper
- Bed:  $50 \pm 10^{\circ}\text{C}$
- Can be tarnished, sanded, and polished
- ***High abrasion; Requires plated nozzle***

### PLA - Composite Carbon Fiber PLA

- Temperature:  $220 \pm 10^{\circ}\text{C}$
- Strong, heat and wear resistant
- Bed:  $50 \pm 10^{\circ}\text{C}$
- ***High abrasion; Requires plated nozzle***

### PLA - Composite Stainless Steel PLA

- Temperature:  $220 \pm 10^{\circ}\text{C}$
- PLA properties
- Strong, durable, with extra weight
- Bed:  $35 \pm 10^{\circ}\text{C}$
- ***High abrasion; Requires plated nozzle***

### PLA - Composite Wood Fill PLA

- Temperature:  $210 \pm 30^{\circ}\text{C}$
- PLA properties
- Similar look and feel to wood
- Bed:  $30 \pm 10^{\circ}\text{C}$
- Hotter extruder leads to darker color
- ***High abrasion; Requires plated nozzle***

### PVA - Polyvinyl Alcohol

- Temperature:  $190 \pm 20^{\circ}\text{C}$
- Stiff water soluble support
- Bed:  $45 \pm 10^{\circ}\text{C}$
- Good PLA support with similar temperature

### TPU - Thermoplastic Polyurethane

- Temperature:  $220 \pm 10^{\circ}\text{C}$
- Rubbery, elastic, and impact resistant
- Oil and grease resistant
- Bed:  $40 \pm 10^{\circ}\text{C}$
- Less infill percentage the more flexible