

Material Information



Tough 1500 Resin

Introduction

Formlabs Tough 1500 Resin is a resilient, skin-safe 3D printing material designed to simulate the strength and stiffness of polypropylene while offering quick spring back after bending. It produces stiff yet pliable parts that can endure repeated deflection without cracking.

Advantages

Tough 1500 Resin offers a unique combination of stiffness, resilience, and quick recovery, enabling the creation of parts that can flex under load and return to their original form without permanent deformation. It is skin-safe, making it suitable for wearable prototypes and consumer products, and its mechanical properties closely mimic those of polypropylene, allowing for realistic functional testing.

Disadvantages

It is not intended for applications requiring extreme softness (like elastomers) or maximum rigidity (like glass-filled resins). Its toughness also means that support removal may require more effort compared to more brittle resins.

Tolerance

$\pm 200\mu\text{m}$ or 0.2%

Color

Translucent Light Gray

Recommendation

Best suited for applications that require a balance of stiffness and flexibility, such as snap-fit assemblies, impact-resistant housings, and functional prototypes that undergo repeated bending. It is an excellent choice for simulating polypropylene in low-volume production or prototyping.

Material Specifications			
Property	Method	Green	Post-Cured
Tensile Strength	ASTM D638-14	26MPa	33MPa
Tensile Modulus	ASTM D638-14	0.94GPa	1.5GPa
Elongation at Break	ASTM D638-14	69%	51%
Flexural Strength	ASTM D790-15	15MPa	39MPa
Flexural Modulus	ASTM D790-15	0.44GPa	1.4GPa
Notched Izod	ASTM D256-10	72J/m	67J/m
Unnotched Izod	ASTM D4812-11	902J/m	1387J/m
Heat Deflection Temp. (1.8MPa)	ASTM D648-16	34°C	45°C
Heat Deflection Temp. (0.45MPa)	ASTM D648-16	42°C	52°C
Thermal Expansion, 0- 150 °C	ASTM E831-13	114µm/m/°C	97µm/m/°C

Attention

Due to the characteristics of resin materials, products printed with resin materials will gradually turn yellow and become brittle after long-term exposure to direct sunlight. If you want to avoid this from happening, you may need to move it out of direct sunlight or add 3D Plus™ services (such as coating) to block out the sunlight.

Applications

3DSPRO finds people using Tough 1500 Resin in the following industries and applications:

Prototyping consumer products:

Snap-fit enclosures, living hinges, and impact-resistant casings.

Wearable devices and accessories:

Custom-fit bands, ergonomic grips, and skin-safe protective gear.

Industrial tooling and fixtures:

Flexible jigs, assembly aids, and fixtures that require repeated deflection.

Automotive and aerospace:

Clips, brackets, and housings that must withstand vibration and bending.

Sports and lifestyle equipment:

Protective guards, flexible connectors, and durable performance gear.