

PLA is the go-to material for most users due to its ease-of-use, dimensional accuracy, and low cost.

Overview

Poly-lactic Acid, commonly known as PLA, is one of the most popular materials used in desktop 3D printing. It is the default filament of choice for most extrusion-based 3D printers because it can be printed at a low temperature and does not require a heated bed. PLA is a great first material to use as you are learning about 3D printing because it is easy to print, very inexpensive, and creates parts that can be used for a wide variety of applications. It is also one of the most environmentally friendly filaments on the market today. Derived from crops such as corn and sugarcane, PLA is renewable and most importantly biodegradable. As a bonus, this also allows the plastic to give off a sweet aroma during printing.

Pros

- Low Cost
- Stiff and good strength
- Good dimensional accuracy
- Good shelf life

Cons

- Low heat resistance
- Can ooze and may need cooling fans
- Filament can get brittle and break
- Not suitable for outdoors (sunlight exposure)



30 €/kg

PETG filament is known for its ease of printability, smooth surface finish, and water resistance.

Overview

PETG is a Glycol Modified version of Polyethylene Terephthalate (PET), which is commonly used to manufacture water bottles. It is a semi-rigid material with good impact resistance, but it has a slightly softer surface which makes it prone to wear. The material also benefits from great thermal characteristics, allowing the plastic to cool efficiently with almost negligible warpage.

Pros

- Glossy and smooth surface finish
- Adheres well to the bed with negligible warping
- Mostly odorless while printing

Cons

- Poor bridging characteristics
- Can produce thin hairs on the surface from stringing



30 €/kg

FLEX filaments, commonly referred to as TPE or TPU, are known for their elasticity allowing the material to easily stretch and bend.

Overview

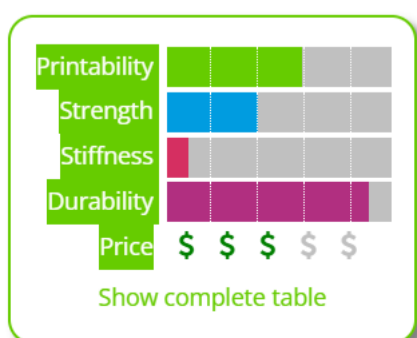
Flexible filaments are made of Thermoplastic Elastomers (TPE) which are a blend of hard plastic and rubber. As the name suggests, this material is elastic in nature allowing the plastic to be stretched and flexed easily. There are several types of TPE, with Thermoplastic polyurethane (TPU) being the most commonly used among 3D printing filaments. In many cases, these terms are used interchangeably, along with popular brand names such as Ninjaflex. The degree of elasticity in the plastic depends on the type of TPE and the chemical formulation used by the manufacturer. For example, some filaments can be partially flexible like a car tire but others can be elastic and fully flexible like a rubber band.

Pros

- Flexible and soft
- Excellent vibration dampening
- Long shelf life
- Good impact resistance

Cons

- Difficult to print
- Poor bridging characteristics
- Possibility of blobs and stringing
- May not work well on Bowden extruders



35 €/kg

ASA is a common alternative to ABS and is great for outdoor applications due to its high UV, temperature, and impact resistance.

Overview

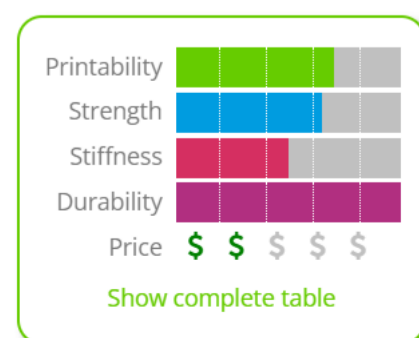
ASA, also known as Acrylic Styrene Acrylonitrile, is a 3D printable plastic with properties similar to ABS. It was originally developed as an alternative to ABS that would be more UV resistant by changing the type of rubber that's used in the formulation. ASA is known for high impact resistance, higher temperature resistance, and increased printing difficulty. It's commonly used in outdoor applications instead of ABS due to its superior resistance to UV and harsh weather conditions. Due to its heritage, ASA still retains many of the same printability drawbacks that are seen with ABS. Warping is still a consistent issue that you need to account for, as well as the potentially dangerous fumes that the plastic emits during printing, due to the presence of Styrene.

Pros

- Strong UV resistance
- High impact and wear resistance
- High glass transition temperature

Cons

- Requires higher extruder temperatures
- Requires ventilation due to potentially dangerous fumes



35 €/kg