Understanding PVA 3D Printing Filament

PVA Filament Composition

PolyVinyl Alcohol (PVA) is a synthetic polymer filament formed by polymerizing vinyl acetate, which is then hydrolyzed to create PVA filament for 3D printing.

PVA filament has a translucent, white appearance. It is resistant to oil as well as grease and solvents, and has excellent adhesive properties. It has high tensile strength and flexibility.

Extruding PVA Filament

The right temperature to melt any filament will vary from printer to printer, but PVA has a glass transition temperature of about 185° F, depending on the polymer's ratio of alcohol to acetate.

If you're searching for the right temperature to extrude PVA in your printer, temperatures from 401 to 428° F are a good start point.

If your printer has a heated bed, try setting it at a temperature of 131 to 140° F.

PVA is odorless, non-toxic, and biodegradable, which makes it safe for humans and animals and great for the environment.

PVA Chemical Solubility

PVA is soluble in water, making it a great choice for a support material, and you won't have to look further than your kitchen sink to find its solvent. Cold water will get the job done, but for more speedy results, try warm water.

If your printer features a dual extruder, simply load a spool of ABS and a spool of PVA, and you're ready to create intricate prints with overhangs.

In addition you could use your printer and PVA filament to create water-soluble molds for ideal casting without the worry of ruining the cast when removing the mold.

Commonly Made with PVA

PVA is commonly used in the production of paper, adhesives, dissolvable packaging such as those seen in single use detergent capsules, printing, eye drops, and textiles.

Fishermen use dissolving PVA bags to help them disperse bait around their hook to attract and catch more fish.

PVA is also used to create putty or slime for child's play. And in 3D printing it is often used as a support material for intricate printing.

PVA and Water

PVA is prone to absorb water, which affects its properties. When water is absorbed, it acts as a plasticizer, which reduces the filament's tensile strength, and increases its elongation and tear strength.

Keep this in mind, and if you're looking to print a part with higher tensile strength, make sure to store your PVA filament in a sealed container with silica beads to reduce moisture.

Precautions for Printing with PVA

If you're printing on an open platform printer, exercise extreme caution, and be aware of your proximity to high-temperature, heated elements. Also remember to keep parts printed with PVA filament in a dry environment.

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