MAKERBOT REPLICATOR : TECHNICAL SUPPORT ARTICLE
ABOUT MAKERBOT PVA FILAMENT

Version 1.1

ABOUT PVA FILAMENT

This Poly Vinyl Alcohol plastic is for 1.75mm / 1.8mm extrusion size. You can just swap the filament from your extruder, and load in the PVA plastic, and then dissolve your parts in water. This plastic builds parts just like ABS, or PLA. The prints come out a matte white color and smell a bit like white craft glue.

We call this filament an "experimental" plastic, because your extrusion temperatures will be different **(160-175C)** from standard ABS settings. You must make sure not to bring it to ABS melting point temperatures!

Please read the below instructions and adjust your machine prior to use. There may be some tweaking of your settings for optimal output. When complete, the parts can then be dropped into cold water to dissolve.

How To Use PVA

This material absorbs moisture once the packaging is opened and should therefore be processed only from the un-opened original bag. Otherwise bubbles may occur in the molding. Damp material can be dried at 60 – 80C for 6 – 8 hours in a circulated air dryer. Suitable processing temperature should not exceed 160-175C because at higher temperatures the material suffers thermal damage. Residence time should be as short as possible, 5 – 10 minutes at most.

Temperature Sensitivity

PVA has a low melt point, and will flow (become liquid) at only 190ºC. This means that while driving the plastic into the nozzle is easy, PVA is also very sensitive to higher temperatures, and begins to undergo pyrolysis at higher than 200ºC. Printing at higher than 200ºC is probably possible, but should be avoided.

Important: If PVA is left to sit at temperatures higher than 200ºC for extended periods of time, it will form tar jams that are extremely difficult to remove. Unlike PLA and ABS, you cannot remove a PVA jam by increasing temperature or drive force. **A jammed nozzle will often need to be re-drilled!**

Storage

MakerBot® Water Soluble PVA remains stable for at least 12 months in its original container provided if it is stored correctly, i.e. indoors at room temperature and dry condition. Like all thermoplastics, MakerBot® Water Soluble PVA must be stored in a cool place. Keep MakerBot® Water Soluble PVA sealed in an airtight container when not in use.

Dissolving PVA

PVA dissolves rapidly with simple submersion. A 10cm cube printed with no one surface at 20% infill and submerged in one cup of room-temperature water will begin to break apart within 20 minutes, and entirely within 24 hours. To speed up the dissolution, gentle stirring can be applied. Warm water may also enhance the process. The water will quickly become an opaque white, and take on the appearance and consistency of wood glue.

Checkout the full video online at www.bilbycnc.com.au/MakerbotReplicatorSupport.asp

1.1 Example of dissolvable PVA filament

"We've come up with a few uses for water soluble components here at the BotCave, and the possibilities are amazing! Some of the applications include: making soluble molds, building removable support structures, biotechnology applications, or fascinating science experiments of your own creation. It is pretty awesome for video and visual effects projects as well.
- Makerbot

For Further Info

MakerBot Water Soluble PVA Wiki page: http://wiki.makerbot.com/pva
PVA Data Sheet: http://makerbot.wdfiles.com/local--files/pva/CP-1210T30_TDS_Tentative.pdf
PVA Safety Data Sheet: http://makerbot.wdfiles.com/local--files/pva/P1006_MSDS_Poval_CP-1210T30_CP-1220T10.pdf

BilbyCNC hopes you found this helpful. Please visit support.bilbycnc.com.au if you need further assistance

