



Hex Core Filament



Subtle3D

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Summary

Print TPU filament with a PETG core! Best of both worlds! Sized to fit a Prusa XL

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Tags: [multimaterial](#) [multicolor](#) [filament](#) [dual](#) [tpu](#) [hex](#)
[petg](#) [core](#) [prusaxl](#) [hexcore](#)

Print 2 (or more) separate materials, not just colors, using the PrusaXL!

Then use the Hex Core Filament to print your object.

This is not just mixing materials together; due to the fairly laminar flow through the nozzle, this is compositing materials!

This is designed to print approx. 120g/40m of filament with one material as the outer sheath and a second material for the core!

It ends up being approx. 45% core material/55% sheath material.

The filament shape is a Bestagon for ease of printing and design. Corner to corner is slightly greater than 1.75 and the flat sides are slightly smaller so it should be functionally equal. The extruder has had no issues. I didn't

calculate volumetric rates so they are probably slightly off but who cares, this is fun!

I have successfully printed Sainsmart Transparent TPU sheath with a 1 color core and a 2 color TPU sheath with 2 colors of Overture3D PETG as the core. Countless combinations could be tried.

A TPU outer and a PETG core seems to display the layer adhesion and durability of TPU with some added rigidity of PETG.

This was used to create a durable radio holder, where PETG alone broke regularly (they are very rough on their tools) and TPU alone was a bit too flexible.

UPDATE:

Successfully used CFPETG as the core and used it to print the Galaxy Fold 4 case. It turned out perfect. Stiffer and feels more durable than regular PETG but still retaining enough flex for the living hinge between the 2 sides. (We'll see how long the hinge lasts)

A bright transparent green TPU was used and it darkened slightly when the filament was made, then darkened a lot after it was re-extruded. interesting color interaction. Pictures attached.

SETTINGS:

All settings were done in Prusaslicer.

Settings to create the Hex Core:

0.4mm nozzle

0.20mm SPEED Layer height setting will take about 5 hours to print

Standard settings for each of the materials your printing with.

Be sure to change all filaments bed temp to whatever bed temp your outer lower material is.

TPU/PETG Hex Core Filament settings:

Using Hex Core filament with a TPU sheath, I just used standard Sainsmart FLEX settings in Prusaslicer and it printed perfectly.

The model is comprised of a top and bottom of the sheath and core that you can set whichever part to whatever material or color you want so you can do dual color, Hex Core, or dual color Hex Core! Fun!

Note: Full transparent sheath with a 2 color core does not seem to be much of a color difference. Same with a 2 color sheath and a 2 color core. The green and yellow TPU and PETG I used appears to be too translucent for any real 2 color appearance. Different colors may work better.

Cross sections of the filament after creation show clear color and material differentiation in the filament but significantly less so after re-extrusion.

The stl's are each individual parts, with the 3mf containing all parts.

Note:

Slicing it takes a few minutes, even on a powerful PC.

Model files



hex-core-filament.3mf

☐ Contains all parts



hex-core-upper.stl



hex-core-lower.stl



hex-outer-lower.stl



hex-outer-upper.stl

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