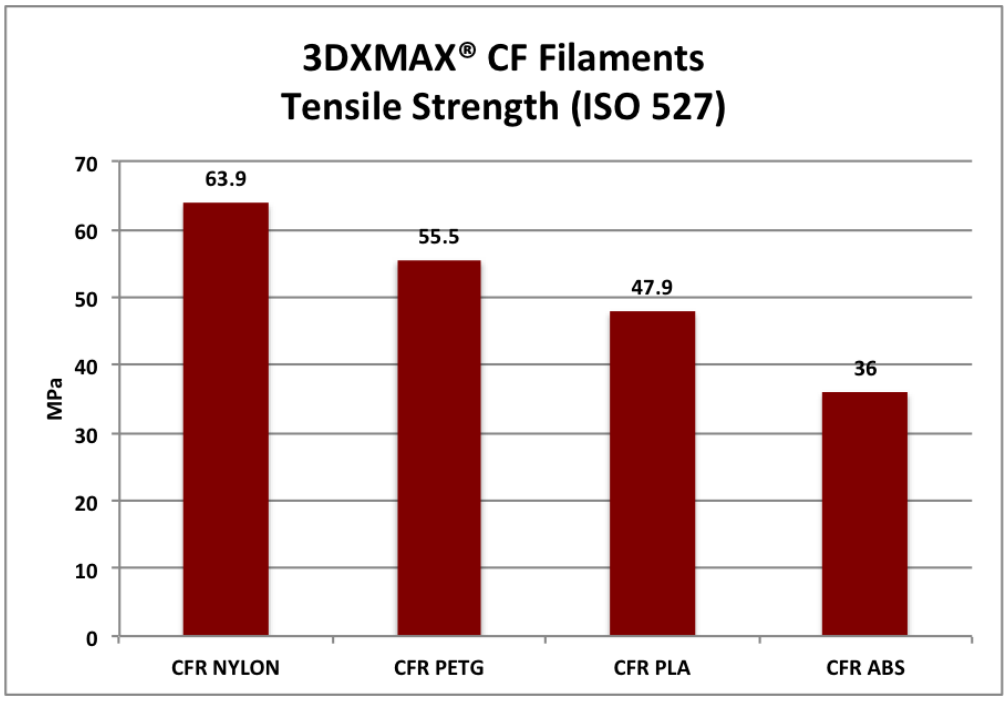
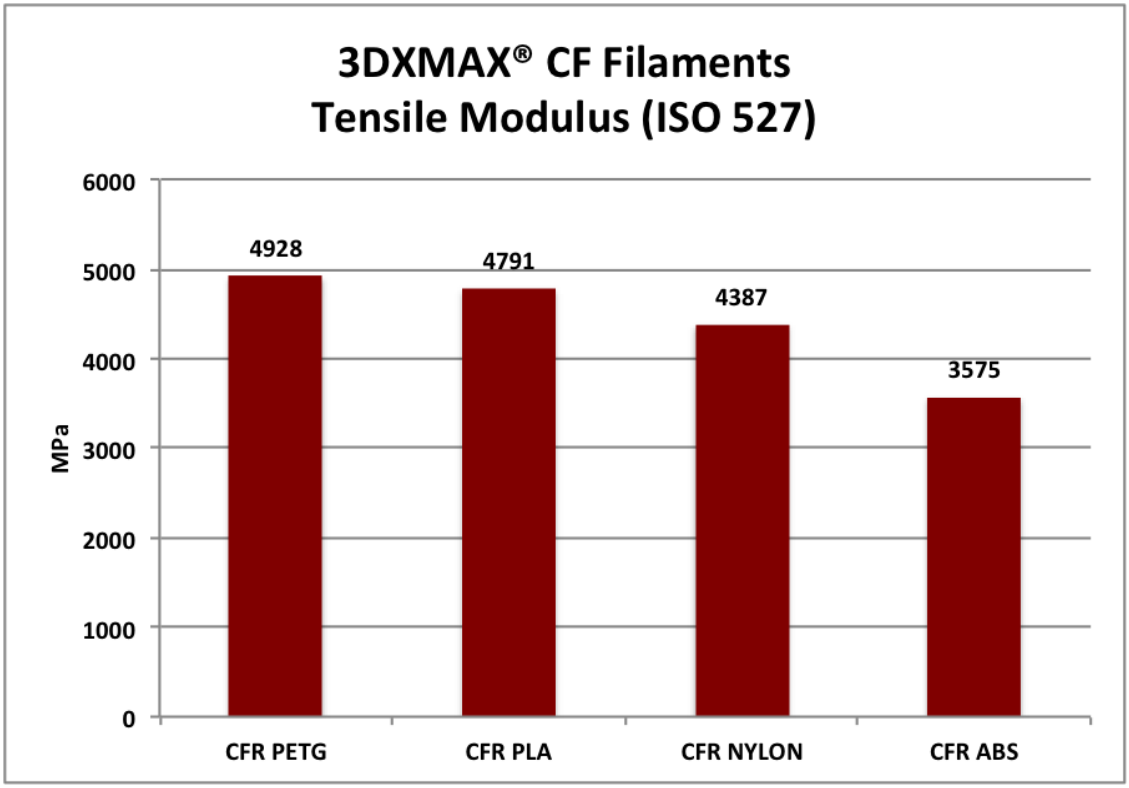
Updated Test Data
We finally have the data back from the lab on our 3DXMAX® Carbon Fiber 3D Filaments. This data covers the most commonly requested mechanical property tests - Tensile Strength, Modulus, and Elongation. It also covers the two primary thermal properties - Heat Distortion Temperature (HDT), and Glass Transition Temperature (Tg).

What you see below is an excellent representation of why we have multiple types of carbon fiber filaments. No two are the same in a given property or well-suited for a particular application. For example, if strength is your main criteria, then our CF Nylon would be the material of choice. However, if stiffness was the main driver, then CF-PETG would be it. However, if short-term thermal properties are your main concern - then it's CF-ABS. This is one of the reasons why we have multiple materials - there is no "one size fits all" solution in engineering materials.



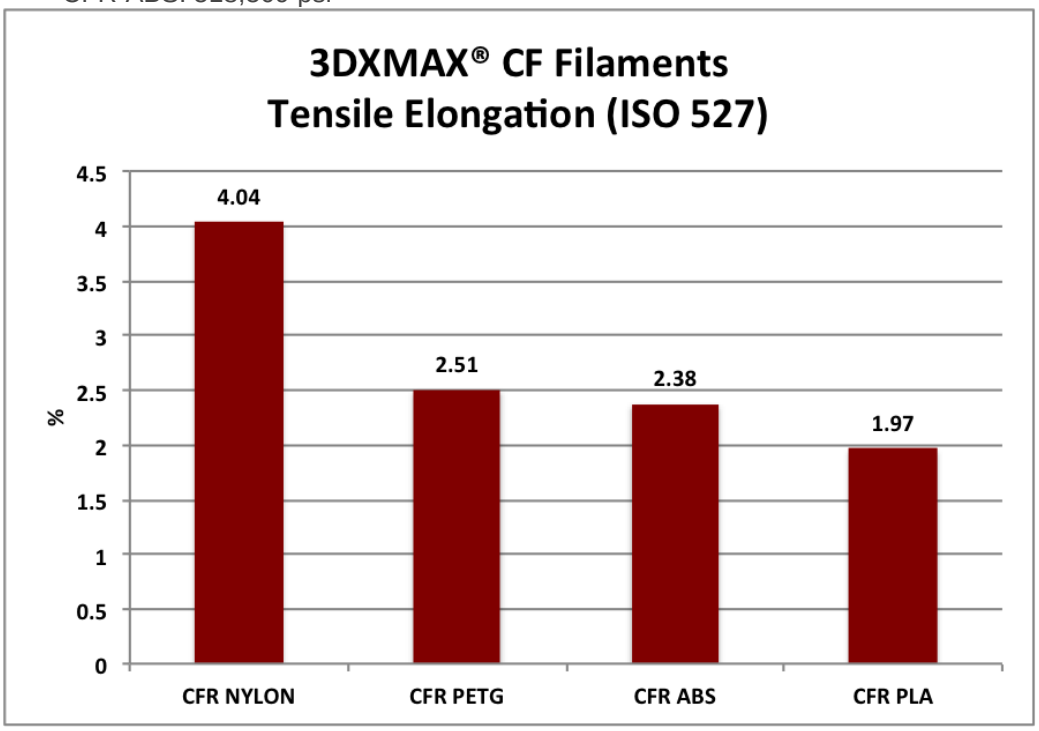
Converted to PSI for our MPa challenged friends, the Tensile Strength of these grades are:

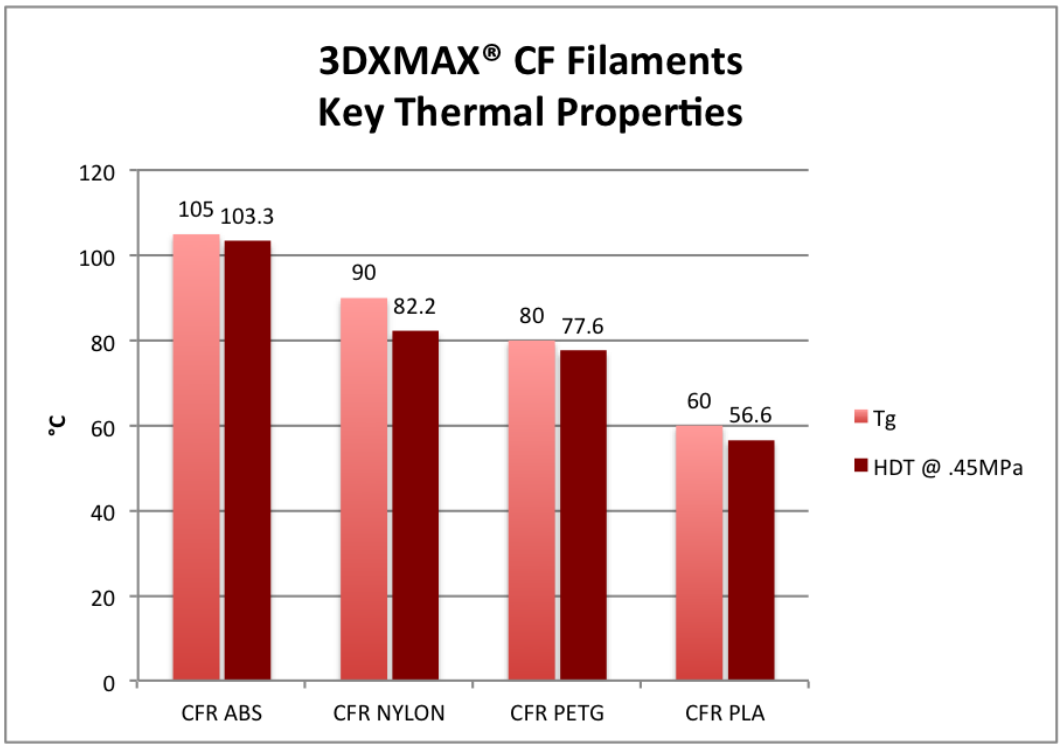
- CFR-Nylon: 9,267 psi (pretty darn nice!)
- CFR-PETG: 8,049 psi
- CFR-PLA: 6,947 psi
- CFR-ABS: 5,221 psi



Again, here's the Tensile Modulus (Stiffness), converted to PSI.

- CFR-PETG: 714,746 psi
- CFR-PLA: 694,875 psi
- CFR-NYLON: 636,280 psi
- CFR-ABS: 518,509 psi





Test Methods

We printed these test specimen using ISO test specimen on a Makergear M2 with an E3Dv6 extruder. Temps were all a bit different due to the various polymers we tested, but we targeted the middle of the recommended range for the print settings. One downside of this approach is that we might have been able to achieve a little higher mechanical properties had we pushed the temp limits and ran them as hot as possible. Instead, we chose to have the data represent an average print on an average machine. With that said, you might be able to achieve higher properties than us if you print the bars hotter (better layer bonding), but this is the approach we decided upon.

- Printer: Makergear M2
- Extruder/Nozzle: E3Dv6 with an A2 hardened steel nozzle
- Extruder Temps: Varied, depending upon the material (see above)
- Layer: 0.2mm
- Infill: 100%, +/- 45 degree