



Two Properties That Define “High Temperature” Plastics

When a plastic is labeled “high temperature,” most people think of one figure: Continuous Use Temperature (CUT). However, getting a clear picture of how a material handles heat requires more nuance than a single datapoint. There are two key measurements to consider:

1. Continuous Use Temperature (CUT)

The highest temperature a material can withstand over time without losing half its strength. Industry standard testing runs for 100,000 hours. That’s more than 11 years of exposure!

2. Heat Deflection Temperature (HDT)

The temperature at which the material softens under load as measured by ASTM D648.

Melting Point and Glass Transition

Some figures matter more during processing than design, but they’re still an important part of the conversation:

- **Melting Temperature (T_m):** The point at which semicrystalline polymers melt
- **Glass Transition Temperature (T_g):** The temperature at which amorphous polymers soften

FYI: Semicrystalline materials like PEEK also have a T_g that influences HDT, but you won’t always see it on datasheets.





High CUT + High HDT = Better Results

The best heat-resistant plastics combine high CUT and high HDT. But not every material can deliver both. Some polymers can handle high temperatures up to 500°F— but only under low stress. That's fine for things like electrical and thermal insulators, but not for load-bearing parts. Other materials may offer high stiffness but break down fast as heat climbs. Many thermoset resins fall into this category, degrading as temperatures near 300°F.

The good news? PEEK gives you both:

- High service temperature for long life
- High softening temperature for parts under stress

In the chart below, notice that adding 30% glass reinforcement (GF) causes PEEK's HDT to jump by 130°F. That means glass-filled PEEK can handle loads right up to 32°F below its CUT.

Measurement	Nylon	PPS	PEEK	GF PEEK
HDT	200°	250°	320°	450°
CUT	194°	428°	482°	482°
Tm	420°	540°	644°	644°



Let's talk about how Ketron™ fits into your portfolio.

Our team is ready when you are! [Contact us.](#)

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Published June 2025.

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