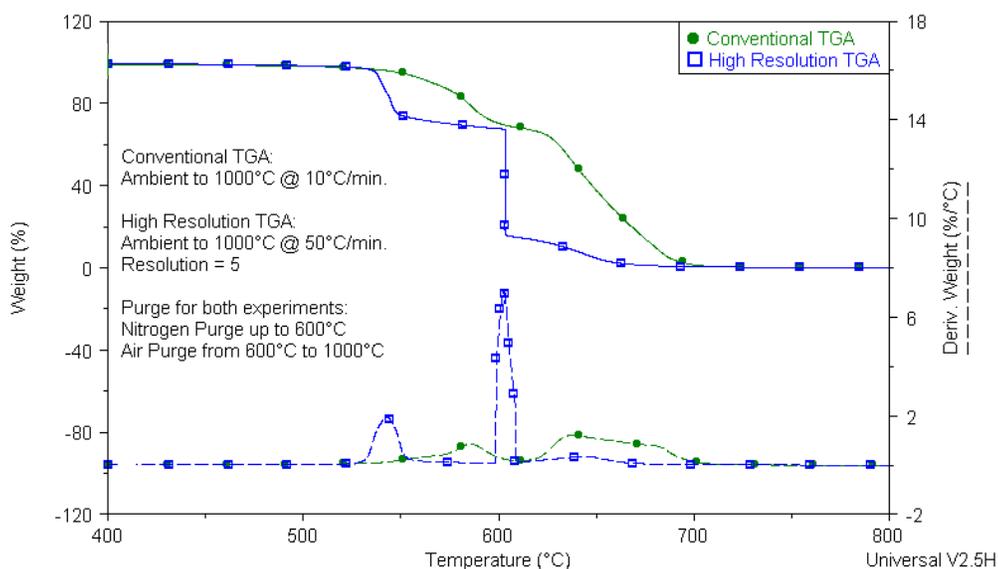


## THERMAL SOLUTIONS

### *Characterization of a PTFE/PEEK/Carbon Fiber Blend by TGA and Hi-Res™ TGA*



**T**hermogravimetric Analysis (TGA) measures the amount and rate of change in sample weight loss as a function of temperature or time. TGA experiments traditionally use linear heating rates to detect weight loss events. Overlapping weight loss events may not be well resolved using conventional TGA. High Resolution TGA (Hi-Res™) is an extension of conventional TGA whereby the heating rate is varied as a function of the rate of sample weight loss. This approach allows the use of high heating rates during regions with no weight loss, then automatically reduces the heating rate during a weight loss transition. This often yields faster experiment times, improved separation of overlapping or poorly defined weight loss events, and sharper derivative peaks.

The above plot shows conventional and high resolution TGA experiments on a PTFE/PEEK/Carbon Fiber blend. Separation of the PEEK and carbon fiber decompositions are not fully resolved using a conventional TGA experiment at 10°C/min. By using the high resolution TGA technique, the PEEK decomposition is well resolved from the carbon fiber decomposition before the switch to an air purge to burn off the carbon. In addition, the decompositions occur at temperatures that are closer to the individual isothermal decomposition temperatures of each material in the sample. This example clearly demonstrates the power of the TGA high resolution technique for resolving closely spaced weight loss events.