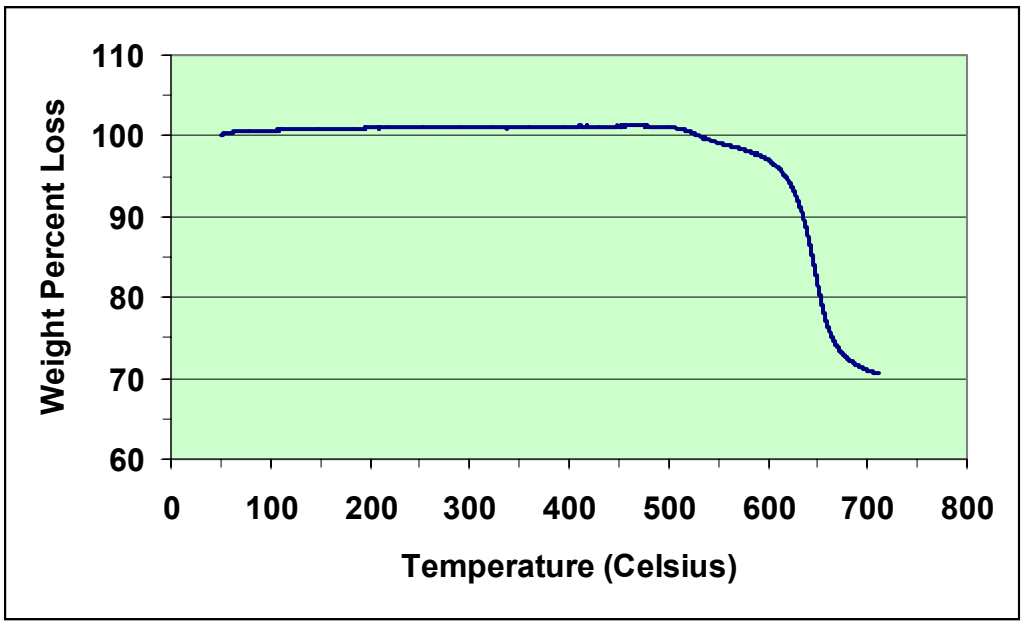
Thermal Stability and Processing of Hydrosize® HP-1632 High Performance Aqueous Solution

Thermogravimetric analysis (TGA) was utilized to investigate the thermal stability of Hydrosize® HP-1632. The sample was heated at 20°C/min in an air.

After Hydrosize® HP-1632 is applied to a surface, the film must be dried and completely "cured" to obtain optimal performance in a film or a composite. Initially, the solution contains about 85% water and the majority must be removed before heating to high temperatures. Poor thermal stability and no char yield results when the film is not properly dried. To thoroughly dry, volatilize the water by ramping the temperature during the drying cycle.



The onset of cure is 210°C. However, it is recommended to heat to a minimum of 225°C or higher (up to 300°C) to ensure complete cure and prevent future out-gassing and formation of voids. A sample of HP-1632 (no fiber) was heated in the TGA instrument to 250°C. After the sample was cooled to 60°C, the sample was heated a second time to 700°C (1292°F). The inherent thermal stability of HP-1632 was observed up to 548°C (°F) where a 2 % weight loss occurred. The highly aromatic polymer has a 70 % char yield at 700°C (1292°F). The recommended maximum temperature for long term use is 371°C (700°F).