

# BURNER RIG OPTIMIZATION FOR HIGH TEMPERATURE MATERIALS AND COATING SYSTEMS

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Ceramic matrix composites and environmental barrier coatings require high temperature and high velocity tests to approach jet engine and hypersonic conditions for hot section parts. A high velocity oxygen fuel (HVOF) burner rig has been automated with respect to a fixed sample in a horizontally mounted MTS machine. A two-axis positioner was created using ball screws rotated with two 2.0 Nm stepper motors controlled via a .NET based GUI controller. Through this system, the torch is moved perpendicular from the specimen, changing the distance to the sample and the resulting surface temperature. The closer the torch, the higher the surface temperature as monitored by a FLIR IR camera and a pyrometer. This arrangement allows for thermo-mechanical fatigue tests by changing the position of the torch in a set pattern to create various thermal-mechanical test conditions, e.g., to mimic an aircraft's takeoff, cruise, and landing cycle. Examples of various thermal-mechanical test conditions will be demonstrated and the material response to those conditions.

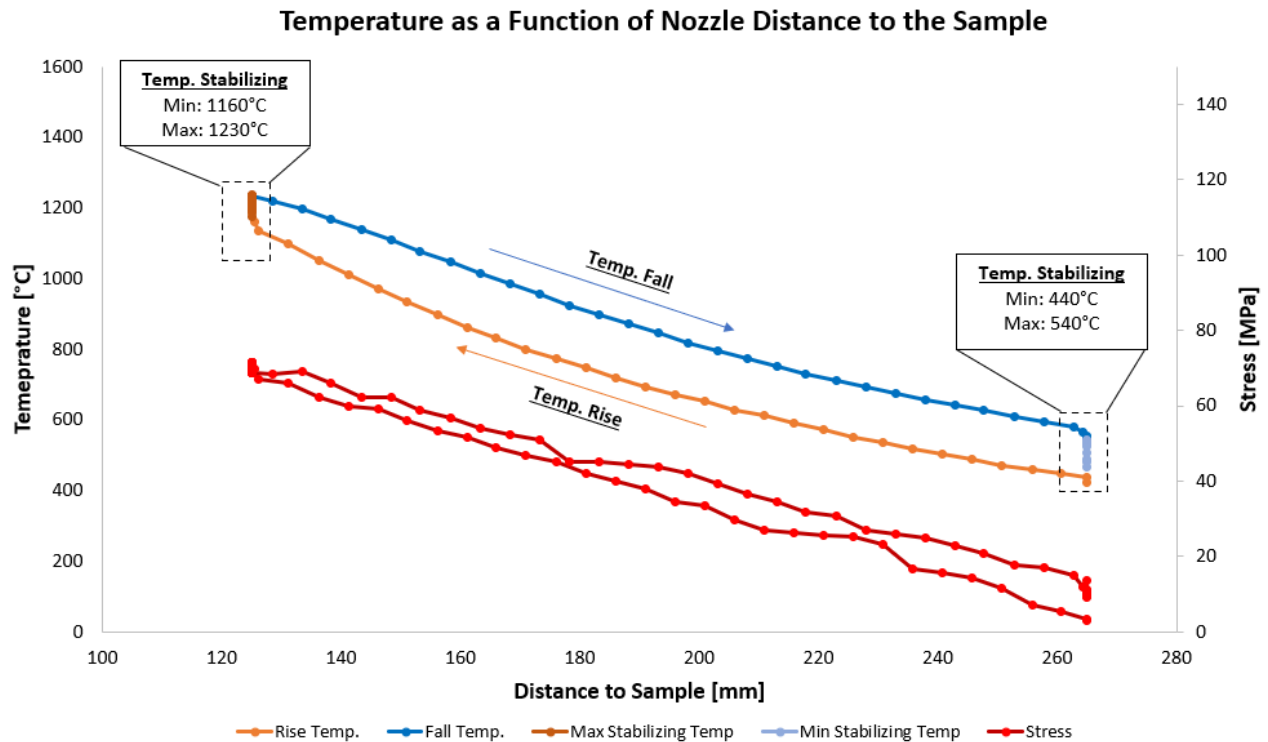


Figure1: Temperature as a Function of Nozzle Distance