

SOLID PARTICLE EROSION BEHAVIOR OF INCONEL 718 SUPER ALLOYS UNDER ELEVATED TEMPERATURES

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ABSTRACT

This work deals with solid particle erosion behavior of Inconel 718 at elevated temperatures. Samples with 3 mm thickness, 25 mm diameter were tested at 3 different temperatures (20°C, 400°C and 600°C); at 4 impingement angles (30°, 45°, 60°, 90°) in a specially designed erosion test rig by using 120 mesh (90-125µm) Al₂O₃ abrasive particles. Solid particle erosion damage characterization was achieved by evaluating the erosion rates after tests. Damage mechanisms were discussed by using scanning electron microscope (SEM) analysis. Surface topographies were analyzed in order to evaluate the effects of experimental parameters on solid particle erosion behavior. Although the conclusion of this work is crucial for understanding the solid particle erosion behavior of Inconel 718 alloy used in turbine blades of aircraft gas turbine engines, it may contribute to develop next generation alloys to be utilized in manufacturing of compressor blades exhibiting longer service durations.

Key Words: Inconel 718, solid particle erosion