

**Thermal Spray: International Advances in Coatings Technology**  
ASM International  
Metals Park, Ohio, 1991, pages 363 368

## **METALLURGY AND PROPERTIES OF PLASMA SPRAY FORMED MATERIALS**

**Timothy McKechnie, Yoon Liaw**  
Rocketdyne Division  
Rockwell International  
Huntsville. Alabama. USA

**Frank Zimmerman, Richard Poorman**  
National Aeronautics and Space Administration  
Marshall Space Flight Center  
Huntsville. Alabama. USA

Understanding the fundamental metallurgy of vacuum plasma spray formed materials is the key to enhancing and developing full material properties. Investigations have shown that the microstructure of plasma sprayed materials must evolve from a powder splat morphology to a recrystallized grain structure to assure high strength and ductility. A fully, or near fully, dense material that exhibits a powder splat morphology will perform as a brittle material compared to a recrystallized grain structure for the same amount of porosity. Metallurgy and material properties of nickel, iron and copper base alloys will be presented and correlated to microstructure.