Plasma Processes, Inc.

NASA SBIR Proposal A5.03-9501

Lightweight, High Conductivity Metal Matrix Composites

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Description and Objectives

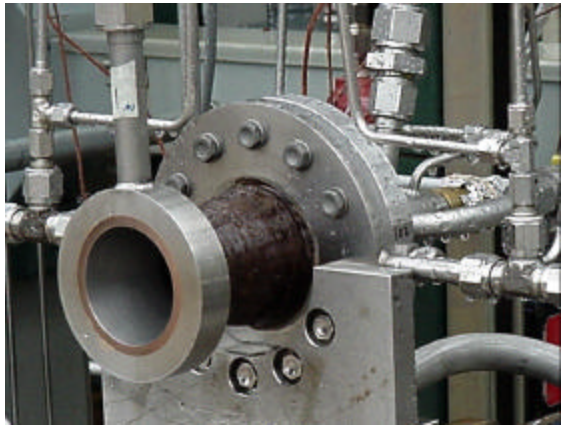
•Increase high temp. strength and lower density of Metal Matrix Composites (MMCc)

•Cu/B_4C, Cu/Al_2O_3,Cu/Diamond MMCs

•Functional gradient surface for high temp. oxidation protection

•Demonstrate net shape fabrication

MMC Material	Density Reduction
$Cu\text{-}60B_4C$	45%
$Cu\text{-}60Al_2O_3$	34%
Cu-8Cr-4Nb	0%



NASA/PPI Combustion Chamber, Candidate for SBIR MMC

Approach

•MMC powder, vacuum plasma form, heat treat or HIP

•Test tensile, density, metallurgy, & conductivity

•Thermal shock and oxidation test

Subcontractor/Partner Phase I: none

Ph II:

Schedule and Deliverables

•6 month program

•Test data

•Report

NASA & Commercial Applications

•Rocket engines (RL10,RL60, SSME, Aerospike, Ballistic, Tactical, etc)

•Heat exchangers, Fusion heat sinks

•Gas turbine combustors, electrodes, etc.

Proprietary Information