Optical Property Evaluation of Next Generation Thermal Control Coatings
RES/Jaworske

Next generation white thermal control coatings were developed via the Small Business Innovative Research program utilizing lithium silicate chemistry as a binder. Doping of the binder with additives yielded a powder that was plasma spray capable and that could be applied to light weight polymers and carbon-carbon composite surfaces. The plasma sprayed coating had acceptable beginning-of-life and end-of-live optical properties, as indicated by a successful 1.5 year exposure to the space environment in low Earth orbit. Recent studies also showed the coating to be durable to simulated space environments consisting of 1 keV and 10 keV electrons, 4.5 MeV electrons, and thermal cycling. Large scale deposition was demonstrated on a polymer matrix composite radiator panel, leading to the selection of the coating for use on the Gravity Recovery And Interior Laboratory (GRAIL) mission.

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