



VACUUM PLASMA SPRAY CELL FACILITY

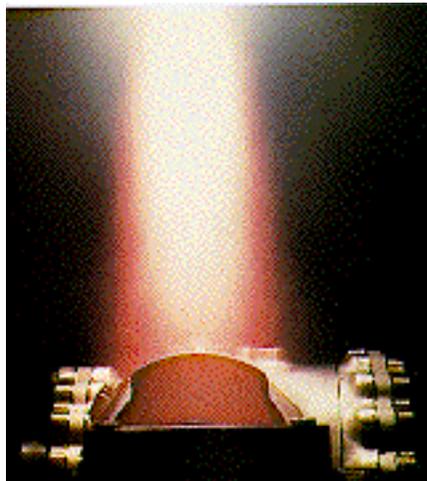
Purpose:

To improve the application of protective coatings and unique metallic materials.

Improved protective coatings and unique metallic materials are under development in the Vacuum Plasma Spray (VPS) Cell. The VPS process takes place in a chamber containing a low pressure, inert gas and produces a high-quality metallurgical bond between materials. Once in the chamber, the hardware is prepared by a process known as “reverse transfer arc” cleaning, where a low-power arc scans the surface to remove any oxides or contaminants. Metallic or ceramic powder mixtures are then introduced into a high-powered plasma, where they are melted and fused to the part.

With this process, high-strength materials can be coated with other materials designed to reduce the effect of thermal shock, wear, or corrosion. Parts can also be formed by spraying successive layers of materials, with each layer specially selected for its unique properties.

Thermal spray coating and forming is a process where a coating thickness of 0.0001 to over 0.750 inch is applied to a surface. In addition, this process can layer dissimilar coating materials so that their desired properties work together, such as in functional gradient coatings. The advantage of plasma spray forming is the ability to utilize combinations of materials, such as tungsten and alumina, that are difficult to form using conventional techniques. Thermal spray coating and forming is applicable to many metallic and non-metallic substrates. The process may also be a suitable alternative to electro-plating and organic paints, especially if portability, high desposition rate, or environmental issues are important. This facility is located in Building 4707.



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