

CERAMIC COATINGS

Applied via High-Energy Plasma

At MBI we apply ceramic coatings by utilizing advanced Plasma spray systems. Ceramic coatings are an engineering tool that can transform an ordinary metal into a high-performance surface.

Ceramic coatings are defined as non-metallic, inorganic materials. High hardness and thermal insulation are commonly recognized properties. Chosen correctly Ceramic coatings can significantly halt wear & corrosion, insulate from heat, even promise dimensional, thermal and chemical stability.

When applied by our high energy Plasma, the coatings produced are considered denser, more wear and corrosion resistant with superior heat shield properties. Ceramic coatings are inert to acids, alkali and solvents. MBI Ceramic coatings improve the properties of any surface they're applied onto.

Typical Properties:

Temperatures: Certain ceramics act as heat shield insulators up to 4000 F.

Hardness: Varies per composition

Bond Strength: Over 12,000 psi

Thickness: From .002" - .050" build-up

Texture: 110-450 Ra (as needed)
Polished 50-110 Ra (Snag-free finish)
1-3 Ra (Ground and lapped)

Porosity: Typically less than 2%
0% when using proper sealers



MAIN FEATURES:

- Severe corrosion protection
- Extreme wear resistance
- Sliding wear
- Erosion /abrasion resistance
- Extreme heat and oxidation resistance
- Built-in lubricity
- Non-snagging satin finish
- Thermal barrier
- Anti-galling
- Low friction
- Extremely seal friendly surfaces
- Electrical resistivity or conductivity

CERAMIC COATINGS as an ENGINEERING TOOL:

High energy Plasma spraying is gaining popularity as an economical way to deposit high performance ceramic coatings for use in many industries.

Many Birds, One Stone: Ceramic coatings are an effective alternative to several surface treatments including plating, nitriding, heat-treatment, anodizing and weld overlays. Ceramic coatings typically out-perform any of the mentioned processes due to the variety of ceramic materials that are available for the application.

Heat Shielding or Dissipating: Ceramics are widely recognized for their amazing thermal barriers and heat shield properties. Used in molten metal handling, automotive engine and exhaust components and in the aerospace industry, it is a proven tool to use when dealing with any kind of heating problem.



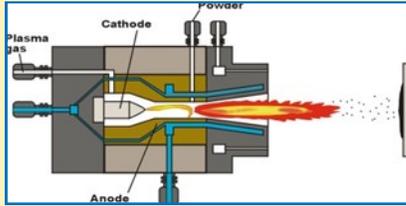
Other advantages of CERAMIC coatings include:

- Wide material range has ability to meet any specification
- Minimal build-up needed for an effective coating
- Can be used in conjunction with MBI's Traclon release coatings
- Endless variations for specific property and application needs
- Offers superb wear resistance compared to other coatings
- Ground finish to as smooth as 1 Ra

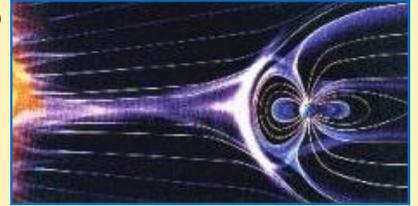


Better CERAMICs with MBI's PLASMA

MBI Ceramic coatings are applied through advanced systems that have even higher energy output. Because of such energy and application method our coatings have higher particle-to-particle cohesive bonding which translates into higher quality coatings. Referencing the figure below, the ceramic coating material, generally in the form of a powder, is injected into a plasma jet during spraying. The high energy, high velocity jet rapidly heats, melts and projects the powder onto a prepared substrate,



where the molten droplets spread and solidify, building up the layers of a coating splat by splat.



Application examples:

Industries include: Aerospace, Marine, Automotive, Non-Woven, Power and Water, Steel and Metals, Mills and Refineries, etc.

Machine parts of all types where maximum wear resistant and/or heat controlling properties are required, such as:

Heated Rolls	Exhaust Systems
Cooling Rolls	Headers and Downpipes
Piston Heads/Sleeves	Bearing Surfaces
Furnace Liners	Seal Surfaces
Thermal Piping	Pulleys
Stretch Rolls	Knives, Rotary, Slitters
Heater Plates and Shields	Shafts, Journals, etc.

Typical Variations of CERAMIC coatings:

PL-130 ALUMINA-TITANIA CERAMIC *This Plasma sprayed coating is extremely popular in the textile and fiber industry. Such coatings are very hard with a fine matte finish ideal for fiber contact.*

PL-106 CHROME-OXIDE CERAMIC *This coating is popular for its superior corrosion and extra wear resistance. Its virtual hardness exceeds 74 Rc making it one of the hardest ceramic materials. It is widely used for seal applications on shafts, sleeves and such.*

PL-201 ZIRCONIUM OXIDE CERAMIC *This coating is applied by our high energy plasma spray processes. It is known for its thermal resistance at temperatures approaching 3000 F.*

PL-210 MAGNESIUM ZIRCONATE CERAMIC *This coating is considered an excellent choice for applications that require resistance to thermal shock with cyclical patterns. It is ideal to be used as coating for ingot molds and molten metal handling equipment.*

PL-102 TITANIUM OXIDE CERAMIC *This coating is considered to be extremely tough, inert with excellent resistance to hard surfaces. It is applied on shaft and high speed spindle surfaces. It works well on applications subjected to mechanical*