Aluminium Oxide (Ceramic) Coating — DSF 3.2.12

Application

Aluminium Oxide (Ceramic) Coating ECM05 onto a metal substrate material using Plasma Flame Deposition (Spraying).

Application Characteristics
Provides a hard coating with a good resistance to wear when in contact with another surface, but will still allowing the surfaces to slide smoothly against each other, with minimum of resistance. Coating can be applied to Aluminium, Mild Steel and Stainless Steel, for any other material contact vendors.

Protective Coating
Protective coating of the coated area is an optional requirement and must be stated on the drawing if required.
ESE-400 is an all-purpose sealant designed to penetrate porosities of the coatings and increase corrosion protection of metal or ceramic thermal spray coatings and substrate underneath. Sealant can be used at service temperatures up to 205°C (400°F) and many corrosive environments including inorganic and organic acids, alkalis, water and many organic solvents and aromatic hydrocarbons.
This coating can be coloured if required, default coating is clear.

Information Required on Drawing
1. Areas to be coated.
2. Areas requiring masking.
3. Required deposit thickness (See below for achievable Deposit Thickness).
4. Required Surface Finish (See below for achievable Surface Finish Range as sprayed & machined).
5. Protective coating requirement and colour.
6. Other protective finish to be applied before or after Aluminium Oxide (See note below about protective finish).
7. Any special requirements.

Protective Finish: -
Zinc protective coating can be applied after Aluminium Oxide has been applied, but Anodise protective coating cannot as it will not adhere to base substrate once Aluminium Oxide has been applied.

Any other protective coating has not been tested for applying before or after Aluminium Oxide, so sample testing will be required.

As Aluminium Oxide process includes bead blasting to create a de-greased and keyed surfaced for the deposit material, and this can damage the base substrate even with masking of the areas not to be coated with Aluminium Oxide (Ceramic) Coating it is advisable to have samples done to ensure that the piece part is not affected by the process.

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Nominal Composition: -	99.5% Al203
Coating Properties Bond Strength: -	>34MPa (ASTM C633)
Micro Hardness: -	900 – 1100 HV
Surface Finish (as sprayed): -	3 to 6um Ra
Surface Finish (machined) : -	<0.1um Ra
Max. Service Temperature: -	1600 Deg C
Dielectric Strength: -	18kV/mm @ 0.1mm thick
Coating Thickness: -	0.05 – 1mm

Finishing

Deposits of ECM05 can be ground to finishes as smooth as 0.1um Ra using diamond or silicon carbide wheels. These coatings can also be lapped to finishes as smooth as 0.05um Ra with standard lapping procedures.

Coating Applications

Coatings are recommended for resistance to wear by abrasive grains, hard surfaces, particle erosion and cavitation. The coating is also ideally suited for applications where a low co-efficient of friction is also required. ECM05 coatings also provide high dielectric strengths and resistance to plasma etching, which makes them ideally suited to applications within the electronics industry. The deposits also exhibit good performance in alkali and acid environments.

Typical Applications include

- OTS Snugger Plate – To reduce Substrate wear on Snugger
- Textile Industry – Thread guides, rollers.
- Semi – conductor processing equipment.
- Electrical insulators
- Soldering iron tips
- Pump Seals
- Super magnet assembly components

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