Weld Overlay with Tungsten Carbide

EutroLoy® 6503

Coating

- Nickel based, chromium-free, matrix with maximum Tungsten Carbide concentration
- Up to 3mm weld overlay thickness per pass
- Wear resistant overlay on steels, stainless steels, cast irons and nickel based alloys
- Excellent carbide distribution throughout the overlay
- Low dilution means full coating properties for extended wear resistance
DESCRIPTION:
Eutroloy 6503 is a blended powder consisting of a nickel, chrome-free, matrix with cast and crushed tungsten carbide. The powder is specifically designed for use with the plasma transferred arc welding process. The coatings produced are hard, dense and especially resistant to low stress abrasion and erosion. Careful control of the chemistry and particle size distribution of both powder components assures consistent performance in the most challenging applications.

COATING PROPERTIES:
Typical matrix hardness: HRC 53-54
Microhard. of WC: 2400 (50-100g load kg/mm²)
Volume of WC: ~ 60%
Typical matrix chemistry: Ni, B, Si
Wear Test Results (ASTM G-65 Test): 9-11mm³ volume loss
(Ref. D2 tool steel 32 mm³)
Standard chrom. carb. plate: 28-30 mm³ volume loss

POWDER PROPERTIES:
Carbide: cast and crushed WC-WC₂C
Carbide to matrix ratio: 60/40
Melting temperature: approx. 2500°F (1370°C)
Max. operating temp.: approx. 1200°F (650°C)
Typical Hardness: matrix 50 HRc (carbide 2400HV)
Density: 0.405 lbs/in³ (11.2g/cm³)
Thickness limit: up to 3mm per pass
Deposition rate: 5-20 lbs/hr (2.2-9kgs/hr)

TYPICAL APPLICATIONS:
Oil and Gas: Stabilizer and hardbanding applications
Agricultural: Ground engagement tools, rub bars, decanter screws
Mining: Shovel bucket teeth, shrouds and adaptors, conveyer screws
Utilities: Fan blades, clinker grinders
Recyclers: Wear guides, defectors, mixing & paddles

PROCEDURE FOR USE:
Remove damaged material. Clean areas to be welded. Match heat input during welding to component, its material and dimensions, and follow the prepared welding procedure for the specific base metal chemistry. Keep dilution with base metal low. Allow workpiece to slowly cool upon completion of welding.

FINISHING:
Coatings of Eutroloy 6503 can be finished by grinding.

PARAMETERS: Plasma Transferred Arc
System: GAP 2001 and 3001 systems
Torch: E52
Anode: dictated by part geometry (1.2, 2.0 or 3mm / 90° or 180°)
Cathode: standard
Shielding Gas Nozzle: standard or high deposit
Pilot Gas: Argon 2.5 Bar - 37 psi (1.5 L/min)
Carrier Gas: 2.5 Bar - 37 psi (1.8-2.5 L/min)
Shielding Gas: Argon/5% hydrogen (10-15 L/min)
Powder Feeder: EP2
Powder Wheel Speed: dictated by part geometry: 20-100 %
Powder Feed Rate: dictated by part geometry: 5-15 lbs/hr (2.2-6.8 kgs/hr)
Amperage*: dictated by part geometry: 90-200 A
Voltage*: dictated by part geometry: 19-28 V

*NOTE: amperage and voltage should be kept as low as possible to maintain WC integrity, while maintaining a well bonded overlay.

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