METTECH

NORTHWEST METTECH CORP.

Axial III™ Plus Spray System - Advanced Coating Solutions

The Axial III Plus torch design gives the user a highly flexible, robust, field proven tool that can apply almost any coating. Axially fed powders or suspensions ensure consistent heat treatment of all particles which leads to superior coatings possible with the most economic results for:

- Wear (abrasion, adhesion, fretting, erosion)
- Thermal Barriers
- Clearance Control (abradables)
- Corrosion / Oxidation
- Electrical (resistance and conductivity)

Capabilities and Benefits

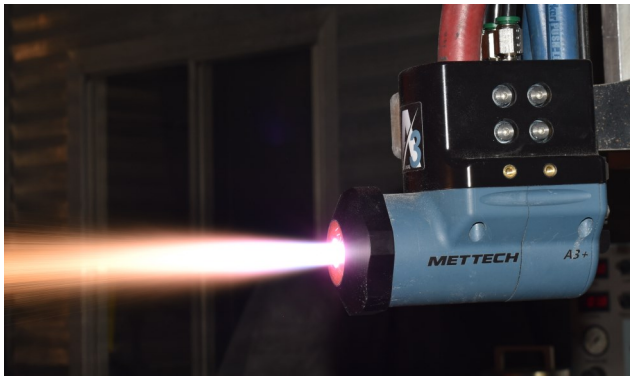
- High deposition efficiencies, less powder waste
- High feed rates, up to 250 g/min, reducing coating time
- Can spray Ceramics, Cermets and Metals
- Can spray reactive or sensitive materials
- Can spray superfine powders (<10µm)
- Wide gas flow range and specialised exit nozzles provide a massive operating window for processing
- Supersonic nozzle designs for high velocity operation
- Suspension or solution feed with NanoFeedTM 350 liquid feeder

Enhanced Coating Quality

- No separation of mixed powders in the flame
- No flame deflection from torch axis
- Increased process stability
- Highly stable plasma – high voltage operation
- Denser coatings than conventional systems are possible
- World class performance when spraying liquid feedstock

Axial III Operation

The Axial III is a 3-anode/3-cathode DC plasma torch with powder injection along the central axis. The plasma streams converge at the point where the powder or suspension is injected. At this point, the plasma/powder flow is accelerated through a specially designed nozzle. Particle velocities can be significantly higher than those of other plasma torches and approach those attained with HVOF systems. The resultant coatings are very consistent, reproducible and of superior quality.



Axial III Saves You Money

Typical Analysis	Axial III System	Radial System
Deposition	80%	50%
Feed Rate (g/min)	120	35
Powder costs / kg	$75	$75
Powder on part	10 kg	10 kg
Powder sprayed	13 kg	20 kg
Powder wasted	3 kg	10 Kg
Deposition time	120 min	600 min
Operating Costs	$177	$850
Powder costs	$500	$1150
Total costs	$1115	$2350

Total Time Reduction 80%
Total Savings 50%

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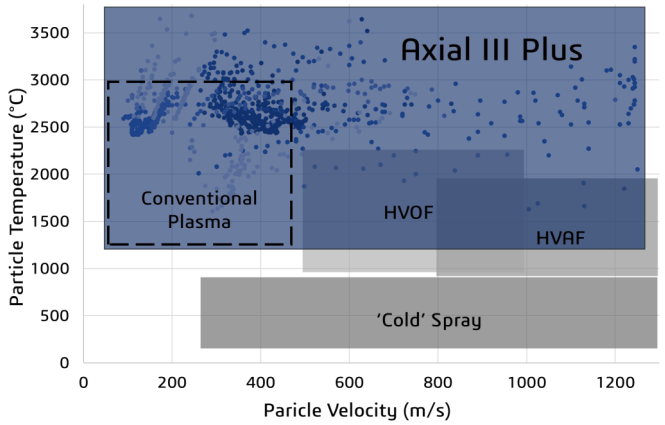


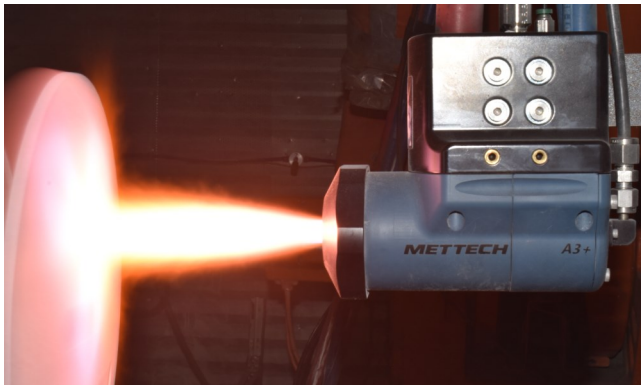
Axial III Plus particle speed and velocity, spraying powders and suspensions

Three-Gas Chemistry

The Axial III Plasma Spray Torch utilizes three gases: Argon (Ar), Nitrogen (N2), and Hydrogen (H2). Helium (He) can be substituted for H2.

The Axial III™ can operate using either Argon or Nitrogen as the primary gas. Factory set maximum flow rates for the gases are:

Ar: 400 l/min, N_2: 200 l/min, H_2: 100 l/min



Axial III Specifications

- Powder Feeding: Carbide-reinforced axial injector
- Electrical Power: 50 – 150 kW
- Electrodes: three cathodes & anodes arranged at 120° spacing
- Plasma Nozzles: 8mm – 14.5mm
- Maximum Pressure Limit in Arc: 4 bars
- Plasma Gas:
  - Argon/nitrogen/hydrogen mixtures
- Current:- 30 to 250 Amps per electrode set
- Electrode Voltage:- 60 – 220 Volts
- Cooling: Water:- 50 l/min @14 bars

Control Equipment

Touch screen control panel, with full display of process variables, data trending and recording, run parameter database, self-diagnostic tools, all bundled in an industrial grade computer.

Control cabinets with segregation between water/gas MFC's and electrical PCL's, CE marked, process feedback control, gas pressure transducers, water flow and temperature measurement for system heat balance.

Power Supplies: Latest generation, high efficiency, water-cooled industrial power supplies.

Contact Information

Northwest Mettech Corp.
#103 – 19335 96 Ave

Surrey, B.C. Canada, V4N 4C4

Tel: 1.604.987.1668

Fax: 1.604.987.1669
email: info@mettech.com

Website: www.mettech.com