Axial III™ Spray System - Advanced Coating Solutions

Axial III Saves You Money

<table>
<thead>
<tr>
<th>Typical Analysis</th>
<th>Axial III System</th>
<th>Radial System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deposition Efficiency</td>
<td>80%</td>
<td>50%</td>
</tr>
<tr>
<td>Feed Rate (g/min)</td>
<td>120</td>
<td>35</td>
</tr>
<tr>
<td>Powder costs / kg</td>
<td>$75</td>
<td>$75</td>
</tr>
<tr>
<td>Powder on part</td>
<td>10 kg</td>
<td>10kg</td>
</tr>
<tr>
<td>Powder sprayed</td>
<td>13 kg</td>
<td>20 kg</td>
</tr>
<tr>
<td>Powder wasted</td>
<td>3 kg</td>
<td>10 kg</td>
</tr>
<tr>
<td>Deposition time</td>
<td>120 min</td>
<td>600 min</td>
</tr>
<tr>
<td>Total Operating Cost</td>
<td>$177</td>
<td>$850</td>
</tr>
<tr>
<td>Total Powder costs</td>
<td>$500</td>
<td>$1150</td>
</tr>
<tr>
<td>Total Costs</td>
<td>$1115</td>
<td>$2350</td>
</tr>
</tbody>
</table>

Total Savings 50%
Total Time Reduction 80%

The Axial III 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 at the most economic results for:

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

Benefits

Efficiency and Productivity
- High deposition efficiencies, less powder waste
- High flow rates, reducing job time
- Can spray Ceramics, Cermets and Metals
- Can spray superfine powders
- Savings on powders and operating cost

Enhanced Coating Quality
- No separation of mixed powders in the flame
- No flame deflection from torch axis
- Increased process stability
- Highly stable plasma
- Denser coatings

Capabilities
- Low angle (>15°) spraying
- Focused gas and supersonic nozzle designs
- Suspension or solution feed possible
- Reactive materials
- Nano materials

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 are 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.
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
- N₂: 200 l/min
- H₂: 100 l/min or; He: 140 l/min

Axial III Specifications

- Powder Feeding: Axial, carbide-reinforced injector
- Electrical Power: 50 – 150 kW
- Number of Cathodes: three cathodes arranged at 120° angles
- Number of Anodes: three
- Plasma Nozzles: 8mm – 25mm
- Maximum Pressure Limit in Arc: 4 bars
- Mixture of Plasma Gas:
  - argon
  - argon/hydrogen
  - argon/nitrogen
  - argon/nitrogen/hydrogen
  - nitrogen/hydrogen
- Current Load: 3x30 to 250 amps
- Electrode Potential 60 – 200 volts
- Cooling: Water, 50 l/min, 14 bars
  - Adaptor: straight 180°, right angled 90°
- Special Gun: Axial III internal spraying gun to 325 mm at 135 kW

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: Proven Industrial design, built-in high voltage pulse, input voltage protection and “forced” air-cooled

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