ELECTRO-SPARK DEPOSITION DEVICE

DepoSeries

Offering Environment Friendly and Energy Saving Maintenance and Repair for Machine Components, Dies, Molds and Toolings.

URL: http://technocoat.co.jp  E-mail: inquiry@technocoat.co.jp  Skype: TechnoCoat

Specification of DepoSeries

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MicroDepo</th>
<th>SparkDepo</th>
<th>DepoTech</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>100W</td>
<td>150W</td>
<td>200W</td>
</tr>
<tr>
<td>Voltage</td>
<td>200V</td>
<td>250V</td>
<td>300V</td>
</tr>
<tr>
<td>Frequency</td>
<td>10kHz</td>
<td>15kHz</td>
<td>20kHz</td>
</tr>
<tr>
<td>Weight</td>
<td>15kg</td>
<td>20kg</td>
<td>25kg</td>
</tr>
<tr>
<td>Capacity</td>
<td>0.3A</td>
<td>0.5A</td>
<td>0.7A</td>
</tr>
<tr>
<td>Consume</td>
<td>0.3kW</td>
<td>0.5kW</td>
<td>0.7kW</td>
</tr>
<tr>
<td>Motor Type</td>
<td>DC Motor</td>
<td>DC Motor</td>
<td>DC Motor</td>
</tr>
<tr>
<td>Motor Speed</td>
<td>1500rpm</td>
<td>1800rpm</td>
<td>2000rpm</td>
</tr>
</tbody>
</table>


Innovative Technology of Coating & Overlay for Maintenance and Repair.
DepoSeries are a new coating and overlay system that takes advantage of Electrical Discharge Machining (EDM) and apply hard carbide coatings and metal and alloy overlays.

**Principles of DepoSeries**

DepoSeries are used for depositing consumable electrode made of alloys and intermetallic compounds on the work piece by means of electric spark at frequency of 10¹-10¹¹ second for 10¹-10¹¹ second spark. Direct current from the power supply will heat the electrode to 6,000 to 25,000⁰F only at the contact areas and transfers a small quantity of the electrode to the work piece under an ionized state and produces a strong metallurgical bond.

**Advantages of DepoSeries**

1. Extremely low heat input eliminates distortion, shrinkages, under-cut and internal stress.
2. Provides excellent bonding by the formation of diffusion layer.
3. Reatable coating thickness and surface roughness can be obtained by adjusting the level of power output and frequency.
4. High power output allows thick coating and retains its property for extended period.
5. Rotating consumable electrode gives high deposition efficiency and produces excellent coating.
6. Very smooth as-coated surface is obtained with a vibrating or an ultra sonic applicator.

**Why DepoSeries is Possible**

A strong bonding of the transferred electrode material occurs due to instantaneous melting of the electrode upon each spark and generation of plasma atmosphere. Refer to Schematic View of The Reaction Area.

**Applicable Substrates**

Low and medium carbon steels, Tool steels, Die and Mold steels, Cast steels, Stainless steels, Aluminum alloys, Copper alloys and the majority of alloys and composites having sufficient electrical conductivity.

**DepoSeries Replaceable Processes**

Chrome plating, Thermal spray coating of plasma, arc and HVOF, CVD, PVD, TD, Nitriding, Carburizing, Quenching, Welding of plasma, arc, argon, Carbides, Diamond, Lining etc.

**Why Overlay for Repair**

The Spark time is extremely short compared with the interval time so that no heat accumulation occurs during diffusion and deposition periods.

**Characteristics of coating & overlay**

1. Wear resistance
2. Heat resistance
3. Scruffing resistance
4. Corrosion resistance
5. Oxidation resistance
6. Lubricity resistance
7. Grip action

**Output (A)**

<table>
<thead>
<tr>
<th>Capacitance (μF)</th>
<th>St (spark time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10⁻¹ to 10⁻³</td>
<td>10⁻¹₂ to 10⁻³</td>
</tr>
</tbody>
</table>

**Output (B)**

<table>
<thead>
<tr>
<th>Current (A)</th>
<th>Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10⁻¹ to 10⁻³</td>
<td>10⁻¹₂ to 10⁻³</td>
</tr>
</tbody>
</table>

**Output (C)**

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>Frequency (kHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10⁻¹ to 10⁻³</td>
<td>10⁻¹₂ to 10⁻³</td>
</tr>
</tbody>
</table>

**Practicality of DepoSeries**

1. Easy to operate after a very short training period.
2. Environmentally safe. Produces no toxic gas, liquid or unpleasant odor and noise.
3. Only required safety gear is safety glasses because of weak UV light generated by the process.
4. The machine has a built-in safety mechanism against electrocution.
5. Finishing stock of the overlay can be kept to the minimum, reducing finishing time.
6. Very smooth as-coated surface is obtained with a vibrating or an ultra sonic applicator.
7. Gripping action
8. Lubricity resistance
9. Grip action

**Why Coating for Preventive Maintenance**

Longer service life by applying a thin layer of WC, TiC, TiB₂, Cr₂O₃, VC etc. that resists wear, heat, scuffing and oxidation.

**Erosion test of coating in molten aluminium**

<table>
<thead>
<tr>
<th>Test method / Sample</th>
<th>SKD61</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molten Al : ADC12 (880°C)</td>
<td>Before Test → After 1 Hr → After 4 Hrs</td>
</tr>
<tr>
<td>Weight loss of the coated sample</td>
<td>less than 10% of the non-coated piece</td>
</tr>
</tbody>
</table>

**Overlay for Repair**

The installation of DepoSeries minimize downtime for repair as well as parts inventory. Resulting in lower cost yet in higher productivity.

**Application example & Useage**

**Coating for Preventive Maintenance**

Longer service life by applying a thin layer of WC, TiC, TiB₂, Cr₂O₃, VC etc. that resists wear, heat, scuffing and oxidation.

**Application on Aluminum Die Casting Die**

Coating on aluminum die casting die for preventive maintenance.

**Application on Injection Mold**

Filling pin holes in a cast Al wheel.

**Application on Casting Die**

Coating on casting die by coating robot.

**Overlay for Repair**

Repair work on mold with crepe-treated surface.

**Reducing Defective Products by Overlay Repair**

Restoration of parting lines on injection molds for preventing burr-formation on molded products.

**Application example & Useage**

**Application on Casting Die**

Preventing erosion, scuffing & heat-checks.

**Application on Aluminum Die Casting Die**

Coating on aluminum die casting die for preventive maintenance.

**Application on Injection Mold**

Filling pin holes in a cast Al wheel.

**Overlay for Repair**

Repair work on mold with crepe-treated surface.

**Reducing Defective Products by Overlay Repair**

Restoration of parting lines on injection molds for preventing burr-formation on molded products.