AEROSPACE

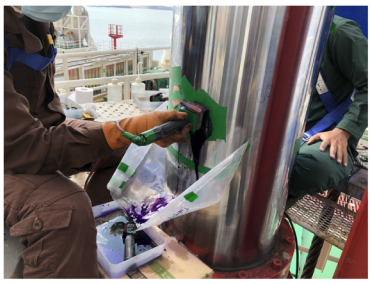
STERLING IMPREGLON ASIA

www.sterlingimpreglonasia.com

What is Brush Plating?

Brush plating, also known as selective plating, is a metal deposition process that targets specific areas on mechanical components.

It offers controlled thickness, excellent adhesion, reduced downtime and minimal hydrogen embrittlement compared to traditional tank/immersion electroplating, making it ideal for repairing, enhancing, or protecting surfaces for a variety of industries.



How does Brush Plating work?

Brush Plating is an electrolytic process that requires four crucial elements – **Anode, Cathode, Potential** and **Electrolyte**. These elements ensure successful Brush Electroplating process.

Brush Plating process begins with surface preparation on the substrate or component, which involves thorough cleaning and proper masking around the area. The anode is then used to apply the Brush Plating solution onto the specific area.

With improvement to Brush Plating process over the years, Brush Plating has developed into a science.

Common Deposits utilized in Aerospace

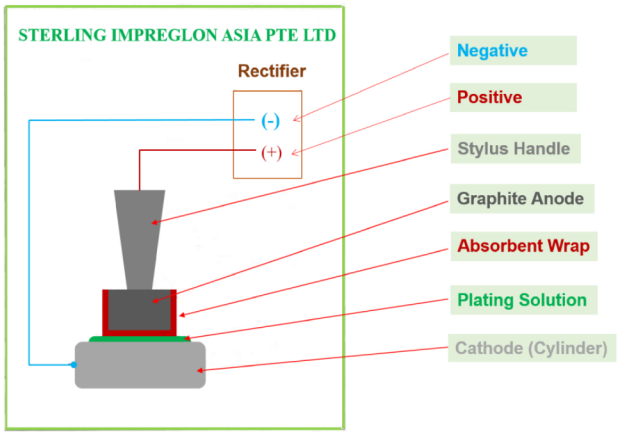
Nickel
- Pre-Braze Operations
- Wear Resistance
- Dimensional Restoration
- Corrosion Protection
- Repair

Cadmium
- Corrosion Protection

Zinc- Nickel
- Alternative to Cadmium Coating

Copper
- Repair
- Dimensional Restoration
- Corrosion Protection

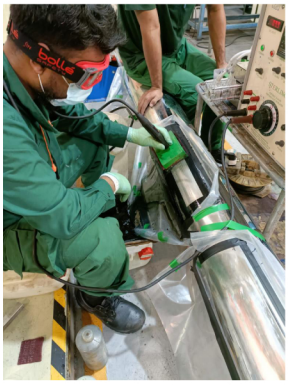
Schematic diagram of Brush Plating Process



About Us

Since 1989, Sterling Impreglon Asia has been recognised a global leader in Brush Electroplating, Immersion/Tank Plating and Capsule/Cell Electroplating.

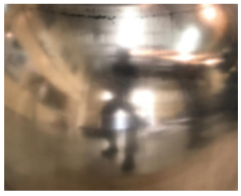
Sterling Impreglon Asia also offers comprehensive chemical solutions with our **STERLING** installation, providing Equipment and Training.



Brush Plating Applications

Corrosion Protection

We specialize in delivering on-site and in-house Brush Plating solution for corrosion protection.



Restoration made to a badly corroded convex surface with the use of brush plating and repeated grinding to get the required dimension.

Surface Enhancement

We utilize nickel plating on OEM components to enhance hardness, wear resistance and corrosion protection.

Refurbishment

Brush Plating is utilized for Maintenance, Repair and Overhaul (MRO) applications, such as to rebuild and restore damaged inside and outside diameters of mechanical components.

This component diameter was smaller after a machining error. So copper brush plating was applied to restore back to the required dimension.

Pre-Braze

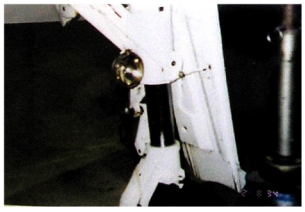
Brush Plating excels in enhancing the Pre-Brazing process for turbine vanes, turbine blades, turbine stators. Selective plating ensures efficient wetting of surfaces, offering a faster, more consistent, and cost effective alternative to traditional methods.

This technique establishes a molecular bond, providing superior wettability, especially with exotic alloys like Rene and Nimonic.

Application on Aerospace Components

Landing Gear Hydraulics & Hydraulic Arms

Brush Plating can be used to repair and restore damaged landing gears which can occur due to corrosion, metal fatigue and overload failure. Selective electroplating repair saves time, money and any potential environmental issue.

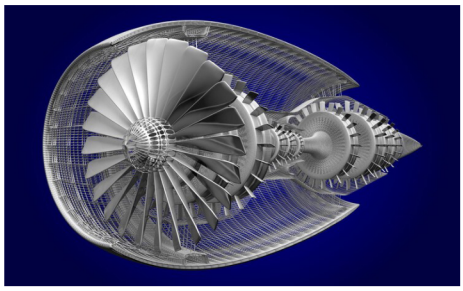


Landing Gear Outer Cylinder

Selective Cadmium Plating can be used to replace the damaged Cadmium Coating caused by pebbles striking the surface of the landing gear and causing a ding. This results in serious damage to the original cadmium coating.

Turbine Frames, Blades and Stator

Originally, these parts undergo tank electroplating, involving complex masking which is time consuming. However, adopting selective Nickel Plating for Pre-Brazing on these components has eliminated the need for intricate masking, and save expensive downtime.



Space Shuttle Main Engine Exhaust Nozzle

These nozzles are both fragile and large, making it impractical to immerse the upper end of it into an electroplating tank. Pre-Brazing through Selective Plating proves to be the ideal method, as it can be performed on-site.

Aircraft Shrouds

Brush Plating is applied on aircraft shrouds (a honeycomb shaped aircraft part) for corrosion protection. This saves valuable time and masking operation for Tank Electroplating.

Benefits

- **Reduced Downtime**

  Brush plating is portable for on-site plating, eliminating the need for extensive masking or complex disassembly. This accelerates production, minimizes handling, reduce unnecessary costs and logistical challenges especially with large components.

- **Contamination-Free Plating**

  Brush plating approach protects sensitive parts from exposure to plating solutions, minimizing contamination.

- **Cost and Time Efficiency**

  Compared to Tank Electroplating, brush plating requires significantly less masking and chemical solution, reducing expensive down-time while maintaining quality.

- **Post-Baking is Not Required**

  Meeting ASTM F519-18 standards for mechanical hydrogen embrittlement testing eliminates the need for post-baking treatment, thus saving both time and costs.

- **Single-Person Operation**

  Portable and user-friendly Brush Plating equipment enables a single person, with training, to accomplish a repair job independently.

Advantages

- **Portable**

  Sterling Brush Plating is simple, compact design ensures portability. The lightweight setup allows easy on-site repair, minimizing disassembly.

- **Controlled Thickness**

  Brush Plating deposition parameters ensures precise controlled thickness.

- **Hydrogen Embrittlement is significantly reduced**

  Brush plating minimizes hydrogen embrittlement risk by utilizing low-hydrogen solutions, ensuring superior mechanical integrity compared to Tank/Immersion electroplating.

- **Ease of Learning**

  Brush plating is straightforward and easy to learn, making it accessible across various industries.

World Leading

Selective Electroplating Company

Address:
4 Joo Koon Road,
Jurong Industrial Estate
Singapore 628968

Mail:
enquiry@sterling.com.sg

Phone:
+65 6285 1455
+65 9666 2862 (Karen Ow)
+65 9624 7909 (Wilson Wang)

Fax:
+65 6285 1812