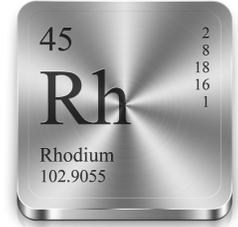


# Rhodium Plating: Electrical Contacts, PCB's & Semiconductor Components

## Rhodium Plating Electrical Contacts, PCB's & Semiconductor Components

- ✓ Vickers Hardness  
1246 MPa
- ✓ Boiling Point 3727°C
- ✓ Melting Point 1966°C
- ✓ Corrosion Resistance
- ✓ Oxidation Resistance
- ✓ Tarnishing Resistance
- ✓ Scratch Resistance
- ✓ Heat Resistance
- ✓ Low Electrical  
Resistance
- ✓ Mechanical Wear
- ✓ Chemical Protection
- ✓ Electrical Conductivity
- ✓ Friction Reduction

Rhodium is a silver-white color, chemically inert, hard transition rare earth metal. It is a member of the platinum group, along with iridium, osmium, palladium, platinum, and ruthenium. Industrial rhodium is particularly precious since it is typically acquired as a by-product of refining other metals, such as copper and nickel. In nature, it is found with other platinum group minerals and metals. With the combination of unique characteristics, rhodium is commonly used as an electrical contact material for electrical contacts, semiconductor wafers, printed circuit boards (PCBs), and other mission-critical components.



### The Challenge

Rhodium has a high barrier to entry due to initial costs, with a high cost of failure. Due to rhodium's inertness, once plated, it cannot be chemically removed for in-process re-work like other precious metals are able to. Companies looking to electroplate rhodium on high value parts need to consider the high risk of failure due to the steep learning curve when developing proper electroplating techniques with rhodium. For this reason, there is a shortage of rhodium platers with experience and adequate capabilities to serve the market demand for challenging electroplating projects.

### The Engineered Solution

Semiconductor electroplating typically has precise requirements such as flatness of base material wafers or precise diameters of the interconnected pins for hermetically sealed connectors, with equally tight plating tolerances for the plating thickness and uniformity deposited to the flat wafers or precise diameter electrical connector pins. Often, these wafer assemblies have miniature features such as numerous small wires and stacked chips compacted onto a small wafer diameter which requires only selective areas of the assembly plated. Other applications include contact pins assembled in a hermetically sealed connector build that requires selective plating at the ends of the pins and specifies a very uniform plating deposit due to post-plating hermetic sealing assembly requirements. Thus, process control is critical for plating and especially critical for rhodium plating to achieve reliable and repeatable outcomes. The plating bath and the parts being processed must be in their purest form, free of dust and particles, and the bath must be frequently maintained and monitored. For this reason, ProPlate employs an in-house chemistry department so that chemistries can be proactively managed. In contrast, many electroplating companies do not have in-house chemical testing and management capabilities, forcing these plating operations to wait for weeks or months to receive bath test data critical to quality outcomes. ProPlate has offered customers rhodium plating services since its inception in 1983, giving them a vast knowledge base of experiences to offer customers unique plating projects and production services.

