

# S-MPuls

## Custom Coating Solution for Coin Minting Dies

When coating stamps, punches and coin minting dies, ensuring surface quality is essential. These surfaces require smooth, dustless coatings with excellent adhesion to accurately replicate highly detailed relief structures. The requirements increase when minting dies are used to produce proof coins, where temperature-sensitive materials are often used. They have narrow tolerances and can only be coated within a certain temperature range.

For coin minting dies, PLATIT has developed a Custom Coating Solution for high-quality coatings with a strong amorphous structure as well as high density, surface quality and reproduction accuracy.

### Highlights:

- Built for the highest demands towards the surface of proof coins
- Full temperature control for temperature sensitive substrates
- Specific holders developed for various stamp sizes and geometries or customized upon request
- Guaranteed smooth dust-free coatings, since the surface to be coated faces downwards; the target is placed on the bottom of the coating chamber
- SPUTTER technology from PLATIT, supported by LGD® (Lateral Glow Discharge) ensures very good adhesion; thus, there are no droplets and no layer defects

## Specifications

### Technologies applied:

- 1 × DC-pulsed magnetron SPUTTER cathode with a rotating magnetic field
- SPUTTER source arranged at the bottom of the chamber

### Etching technologies applied:

- LGD®
- Plasma etching with argon, glow discharge, with auxiliary anode

### Load and cycle times:

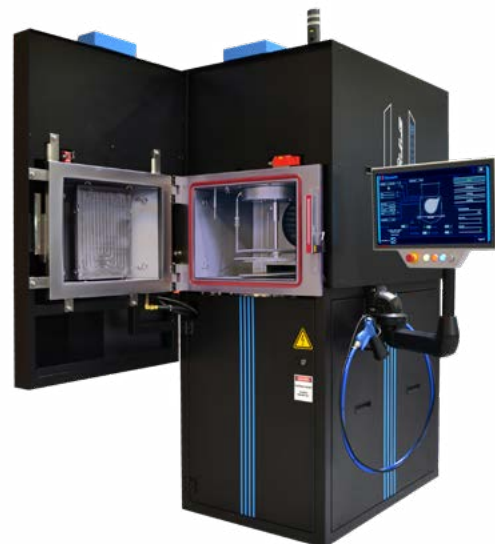
- 4–6 batches/day with a batch time of 3.5 h
- Coating diameter with defined coating thickness:  $\varnothing$  70–250 [mm]
- Substrate holder:  $\varnothing$  300 mm, varying customer-specific versions possible
- Load up to 20 kg

### Machine dimensions:

- Footprint (coating unit with electrical cabinet):  
W 945 × D 1403 × H 2068 +  
W 608 × D 1369 × H 2068 [mm]

### Software:

- Simple use and maintenance
- PLATIT SmartSoftware (PC and PLC system)
- Modern control system with touch screen
- Statistics and help function via user interface
- Data recording and real-time display of process parameters and flow
- Manual and automatic process control
- Remote diagnostics and maintenance



# Ceramicoin

## Dedicated PVD coating for coin minting dies

Ceramicoin, deposited with S-MPuls, replicates every detail of the surface and is thus a significant advantage for coin appearance and design features.

### Quality features of Ceramicoin:

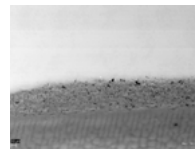
- Surface quality
- Durability
- Smoothness
- Coating adhesion
- Replication of every detail
- Extended die life

### Advantages of PVD technology compared to Cr-plating:

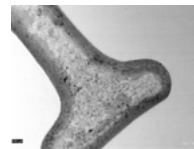
- No hexavalent chromium
- No noise
- No chemicals
- No contamination
- No fumes
- No toxic waste
- No risk for your health

### Highlights:

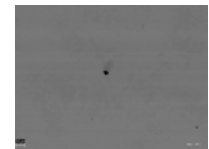
- Coin minting dies ready to use
- No post-polishing needed
- No post-cleaning needed
- Fast cycle times: < 4 h
  - Pumping, heating: ~ 60 min
  - Etching: ~ 35 min
  - Coating: ~ 40 min
  - Cooling, venting: 30 – 60 min



Residues from engraving (oxides)



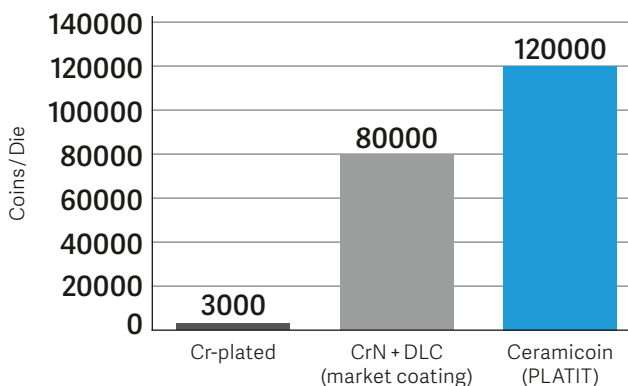
Residues from polishing



Material inhomogeneities (pores or carbides)

### Specifications

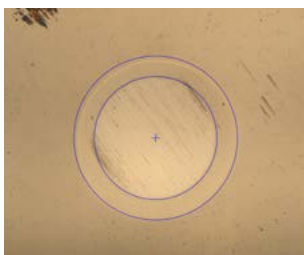
Color	satin silver
Nano-hardness [GPa]	32
Coefficient of friction [ $\mu$ ] PoD (at RT, 50% humidity)	0.4
Coating thickness [ $\mu\text{m}$ ]	1
Max. service temperature [ $^{\circ}\text{C}$ ]	600
Coating temperature [ $^{\circ}\text{C}$ ]	200



View inside the coating chamber with up to 40 coin minting dies per batch:

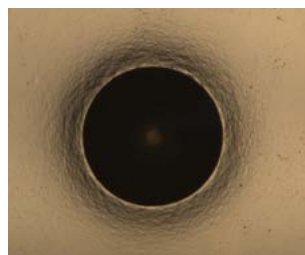


Grinding image



Thickness total: 1.05  $\mu\text{m}$

Rockwell image



Adhesion class: HF 1