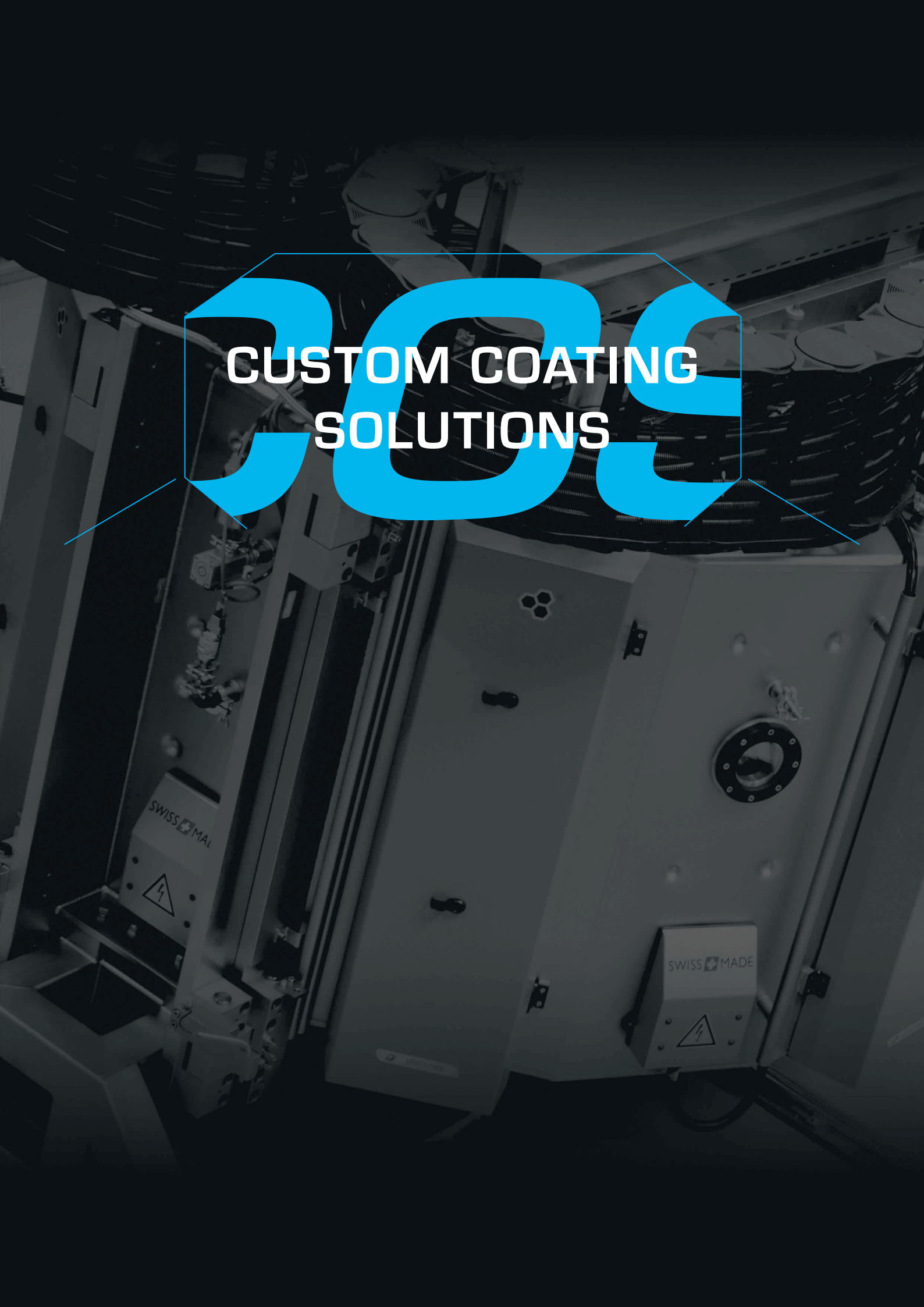
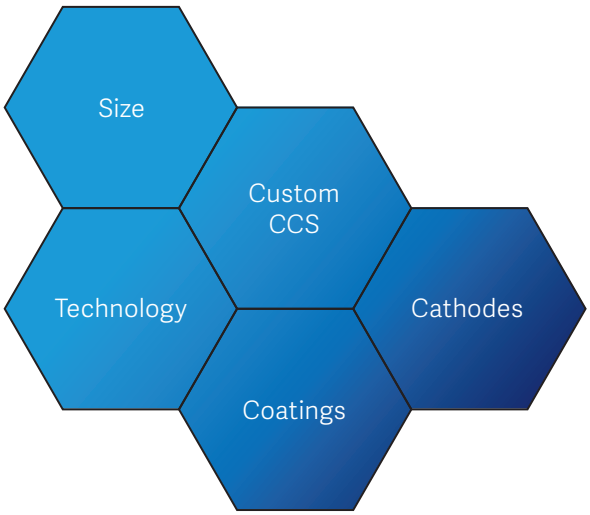

CUSTOM COATING
SOLUTIONS

CCS – Custom Coating Solutions

PLATIT's Custom Coating Solutions meet any special requirements. They are user-defined in every respect:



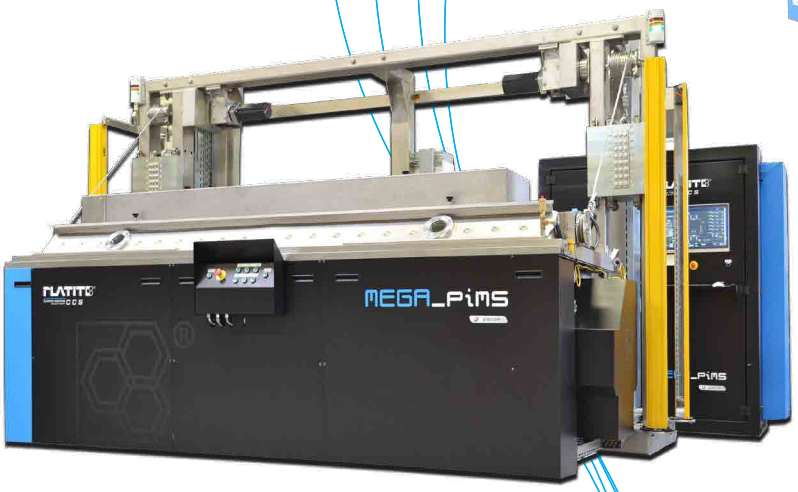
Engineers and technicians from PLATIT in the CCS (Custom Coating Solutions) division in Switzerland advise customers and design, develop, manufacture and program systems according to the individual requirements. They develop solutions in close exchange with customers and accompany them over the years by providing support and supplying spare parts.

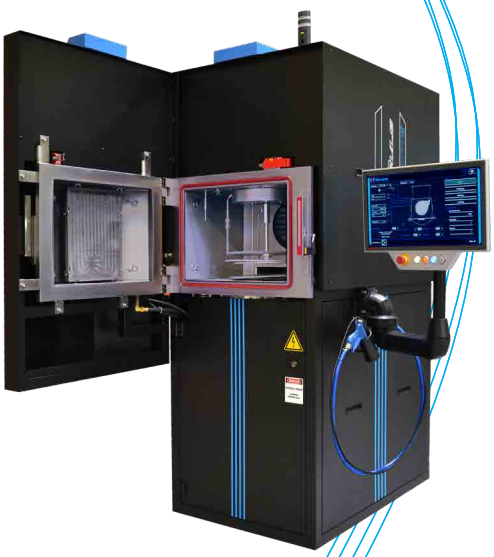
For this purpose, PLATIT has established a network of companies for cooperation in the production of components. PLATIT also manufactures special holders as well as handling devices and works together with various partners to offer peripheral equipment adapted to the Custom Coating Solutions.

For inspiration, the following pages show different sample applications for which PLATIT has already developed, manufactured and delivered coating systems.


FLATITE


FLATITE
CUSTOM COATING SOLUTIONS CCS


FLATITE
MEGA_PiMS




FLATITE

CCS for technological lead

Coating centers and manufacturers in various applications need to be flexible in coating high volume of small and large substrates together – from high-performance cutting tools to components and forming tools. This allows them to save time and costs per batch – without compromising coating performance.

PLATIT continuously adapts coating systems and their technologies to the current and future requirements. The PVD coating units that can produce such high-performance coatings are among the best in the world and are used by very successful high-tech manufacturing companies, regrinders as well as coating centers around the world.

Sample Custom Coating Solution_Pi1511

The Pi1511 is a high-volume PVD coating unit. It combines three rotating PLATIT LARC® XL cathodes positioned inside the door with two Planar ARC cathodes in the back of the chamber. The combination of round cathodes with high-performing Planar cathodes allows for the deposition of PLATIT Signature Coatings with familiar flexibility. The LARC® XL cathodes have a very long lifespan and thus guarantee high productivity at a low cost per tool. Customers with a strong focus on innovation and technology use the mix of planar and round cathodes in the Pi1511 to generate an exceptional performance advantage with the unique cathode configuration.

Highlights:

- Uniquely flexible cathode composition with three rotating and two planar ARC cathodes for exclusive performance benefits
- Fast cathode exchange and long lifetime of the LARC® XL cathodes (LAteral Rotating XL Cathode)
- MAC-3C (Magnetic ARC Confinement – Coil Current Compensation) for automated magnetic field adjustment to increase the lifetime of a target
- Possibility to develop in-house coatings
- User-friendly and intuitive software that meets the latest standards
- Focused on specific applications in Industry 4.0

Specifications_Sample Custom Coating Solution Pi1511

Technologies applied:
- 3 × LARC® XL (LAteral Rotating XL Cathode) inside the door and 2 × Planar cathode with ARC technology in the back
- MAC-3C (Magnetic ARC Confinement – Coil Current Compensation) for automated magnetic field adjustment
- Quick cathode exchange
- Deposition of PLATIT Signature Coatings

Etching technologies applied:
- LGD® (Lateral Glow Discharge)
- Plasma etching with argon, glow discharge
- Metal ion etching (Ti, Cr)

Load and cycle times:
- Max. coating volume: ø 715 × H 805 [mm]
- Max. coating height with defined coating thickness: 711 mm
- Max. load: 750 kg; higher weight upon request

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

Machine dimensions:
- Footprint: W 5,000 × D 2,200 × H 2,500 [mm]

Cathodes	Cathodes	Cycle	Max. Load	Solution	Service
2	3	≥ 7 h	750 kg	Turnkey	Custom

CCS for Saw Bands

The biggest challenge in the handling as well as coating of saw bands is their size as they are wound on a tool carrier, the coil. Due to circumferential speed, layer growth can result in varying coating thickness.

PLATIT has mastered this problem by developing and manufacturing a Custom Coating Solution:

- To improve the handling, the coating chamber door opens sideways; the opened chamber door can be swiveled by 90° so the loading and unloading can take place from the left-hand side
- The coil is arranged at a certain angle to the deposition technology to ensure a constant coating thickness distribution
- The LGD® (Lateral Glow Discharge) process is used for etching and improved coating adhesion
- To guarantee a uniform coating, the teeth and the back of the saw band are coated by different cathode types
- The coating process takes place at a maximum temperature of 500 °C to ensure that the physical and chemical properties of the saw band remain unchanged
- Coating increases the lifespan of saw bands and improves the cutting performance during sawing; the development of tool wear is reduced

Sample Custom Coating Solution_Pi603

To meet the specific product requirements, PLATIT has developed a state-of-the-art turnkey system featuring a high-vacuum custom coating solution and a single-chamber cleaning system. The saw bands are wound as a coil and are both cleaned and coated with the same product carrier, ensuring an efficient and seamless process.

In 2024, PLATIT successfully implemented this advanced system for a long-standing customer, integrating the latest technology to achieve high efficiency and performance. The newly developed process enables fast coating times while maintaining excellent quality and ease of operation. Even operators who are not experienced with such technologies can work with this unit with ease. Pursuant to the open-source principle, PLATIT has transferred its knowledge to the customer so that they can benefit from the advantages of LARC® cathodes and flexibly combine as well as develop their own coatings.

This innovation underscores PLATIT's commitment to delivering cutting-edge solutions that enhance productivity and flexibility in industrial coating applications.

Specifications_Sample Custom Coating Solution Pi603

Technologies applied:
- 3 × LARC® cathode by PLATIT with ARC technology
- 1 × Planar ARC cathode for uniform coating of the backs of saw bands

Etching technologies applied:
- LGD®
- Plasma etching with argon, glow discharge
- Metal ion etching (Ti, Cr)

Load and cycle times:
- 3 batches / day with a batch time of 7 h
- Saw band diameter up to 1,360 mm
- Inner packing diameter: 560 mm
- Saw band height up to 100 mm
- Saw band weight incl. carrier up to 600 kg

Software:
- Simple use and maintenance
- PLATIT SmartSoftware (PC and PLC system)
- Modern control system with touch screen
- Data recording and real-time display of process parameters and flow
- Manual and automatic process control
- Remote diagnostics and maintenance

Machine dimensions:
- Footprint: W 5,900 × D 6,450 × H 3,100 [mm]

CCS
Pi603

Cathodes	Cathodes	Cycle	Max. Load	Solution	Service
3	1	7 h	600 kg	Turnkey	Custom

CCS for Saw Blades

When it comes to coating saw blades, the biggest challenge is to find a coating unit that can efficiently coat large quantities in a single batch at a high level of quality without damaging the saw blades. Due to their high content of heat-sensitive steel, accurately controlling the process temperature is essential. If the process temperature is too high, the saw blade deforms and thus loses its cutting force.

PLATIT designs special coating units to meet these challenges:

- The PVD unit has a temperature control system for coating saw blades; the temperature is kept within a very narrow range
- The use of ARC power supplies on alloyed targets improves the deposition rate and coating distribution, ensures uniform erosion and extends the target material's lifespan
- Pulsed cathodes and improved ARC distribution produce smoother coatings
- The coating chamber is suitable for large tools and substrates
- The modular carousel design provides maximum loading flexibility

A rail system ensures that the carousel trolley is always correctly aligned with the chamber, thereby making the loading and unloading of loads of up to 1800 kg easy. The height of the custom-designed carousel trolley can be adjusted at the touch of a button.

CCS
PL2011

Sample Custom Coating Solution_PL2011

For the coating of large saw blades up to a ø of 1,423 mm (56"), PLATIT has built a high-capacity coating unit. A custom-designed carousel with 6 configurations allows for maximum loading flexibility while maintaining the quality of the coating. Tools with a small or large diameter or mixed loads can be coated in one batch.

The unit is equipped with two doors to provide:

- Optimal access to the chamber
- Simplified maintenance of both the machine and the cathodes
- Simplified batch management since a completed batch can be removed through one door and the next batch loaded immediately via the other door

Specifications_Sample Custom Coating Solution PL2011

Technologies applied:
- 6 × Planar ARC cathode, 4 of which pulsed with ARC power supplies

Etching technologies applied:
- LGD® (Lateral Glow Discharge) with 2 cathodes with a shutter and 2 cathodes acting as anodes
- Plasma etching with argon, glow discharge
- Metal ion etching (Ti, Cr)

Load and cycle times:
- Coating volume up to ø 1,400 × H 700 [mm]
- Load up to 1,800 kg

Software:
- Simple use and maintenance
- PLATIT SmartSoftware (PC and PLC system)
- Modern control system with touch screen
- Data recording and real-time display of process parameters and flow
- Manual and automatic process control
- Remote diagnostics and maintenance

Machine dimensions:
- Footprint: W 8,000 × D 5,800 × H 2,350 [mm]

Batch times PL2011*:

Saw blade (2.5 µm), 1fold rot.	Max ø 1,400 [mm] / 56 inch	20 pcs.	8 h
Saw blade (2.5 µm), 2fold rot.	Max ø 460 [mm] / 18 inch	150 pcs.	8 h
Saw blade (2.5 µm), 2fold rot.	Max ø 650 [mm] / 25.5 inch	75 pcs.	8 h
Saw blade (2.5 µm), 2fold rot.	Max ø 350 [mm] / 13.7 inch	200 pcs.	8 h
Saw blade (2.5 µm), 2fold rot.	Max ø 250 [mm] / 9.8 inch	250 pcs.	8 h
Band saw 1.6 mm / 0.06 inch (5 µm), 1fold rot.	5 x Coil: ø 400 – ø 680 [mm] ø 15.7 – ø26.7 inch	320 pcs.	8 h
Shank tools (2 µm), 4fold rot.	ø 8 x 70 [mm] ø 0.31 x 2.7 inch	3,888 pcs.	≈ 11 h
Inserts (3 µm), 4fold rot.	ø 12 x 4 [mm] ø 0.47 x 0.15 inch	45,360 pcs.	≈ 13 h

* Average cycle times in an ongoing production with max. number of cathodes in use.

Cathodes	**Cycle**	**Max. Load**	**Solution**	**Service**
6	≥ 8 h	1,800 kg	Turnkey	Custom

CCS for Rollers

Because of their weight, large sizes and special geometry, rollers are difficult to handle and not suitable for coating in standard coating units. The coated surface must be defect free and prevent the workpiece material sticking on the tool.

PLATIT develops Custom Coating Solutions tailored to special applications:

- The unit is set to lower system temperatures for heat-sensitive tools and machine components made of high-speed steel
- The vacuum system is further developed for steady coating thickness distribution for large chamber volumes
- Smoothest surface and micro-hardness uniformity of the coating is enabled by pulsed DC coating technology
- The design and handling concept can be flexibly adapted to the weight and size of the tools, ensuring easy operation and maximum user comfort; target change is uncomplicated

Sample Custom Coating Solution_Mega-PiMS

PLATIT has designed a Custom Coating Solution with simplified loading in which the rollers are positioned horizontally. The cathode is located at the bottom of the coating chamber. PLATIT's SPUTTER technology is used to guarantee smooth coatings for high-gloss-polished or textured surfaces.

CCS
Mega-PiMS

Specifications_Sample Custom Coating Solution Mega-PiMS

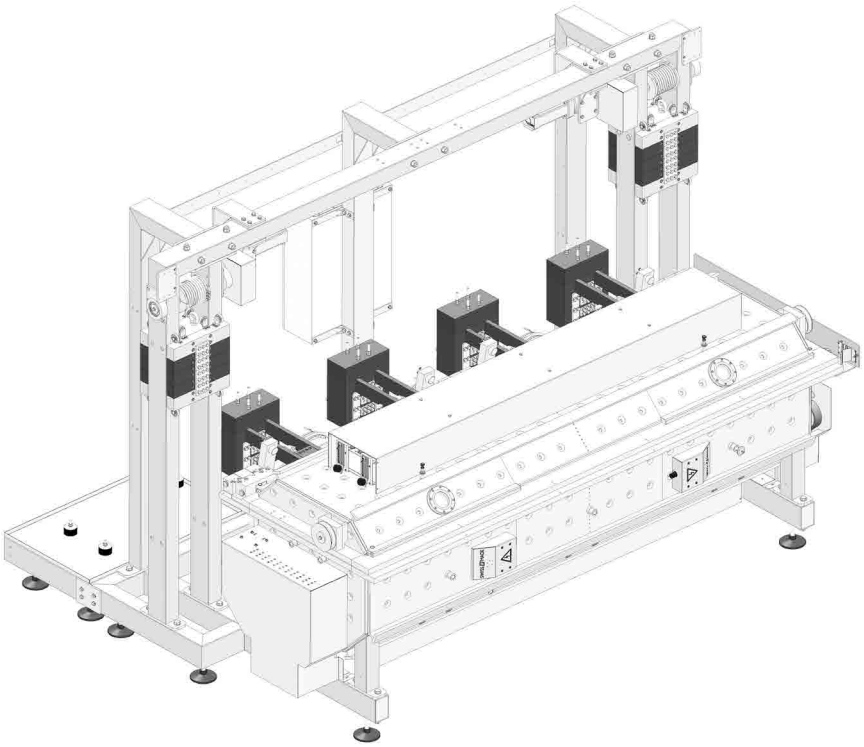
Technologies applied:
- 1 × SPUTTER cathode
- 1 × anode on the opposite side

Etching technologies applied:
- LGD® (Lateral Glow Discharge)
- Plasma etching with argon, glow discharge

Load:
- Coating volume up to ø 600 × L 3,000 [mm]
- Coating volume with defined coating thickness up to ø 600 × L 2,000 [mm]
- Load up to 1,000 kg; higher weight upon request

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

Machine dimensions:
- Footprint (coating unit with electrical cabinet): W 4,100 × D 2,900 × H 2,700 + W 1,900 × D 1,100 × H 2,200 [mm]



Cathodes	Max. Load	Solution	Service
1	1,000 kg	Turnkey	Custom

CCS for Coin Minting Dies

Custom Coating Solution for Coin Minting Dies

When coating stamps, punches and coin minting dies, ensuring surface quality is essential. These surfaces require smooth, dust-free coatings with excellent adhesion to accurately replicate highly detailed relief structures. The requirements increase when minting dies are used for proof coins, where temperature-sensitive materials are often involved. 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, high density, surface quality and reproduction accuracy.

Highlights:

- Designed to meet for the highest demands 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_Sample Custom Coating Solution S-MPuls

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:
- Batch time of 3–4.5 h
- Coating diameter with defined coating thickness: ø 70–250 [mm]
- Substrate holder: ø 300 mm, varying customer-specific versions possible
- Load up to 20 kg

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

Machine dimensions:
- Footprint (coating unit with electrical cabinet): W 945 × D 1,403 × H 2,068 + W 608 × D 1,369 × H 2,068 [mm]

CCS
S-MPuls

Cathodes	Cycle	Max. Load	Solution	Service
1	≥ 3 h	20 kg	Turnkey	Custom

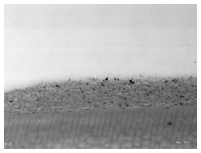
Ceramicoin

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.

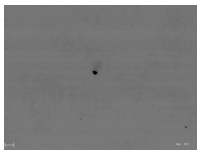
Quality features of Ceramicoin:
- Surface quality
- Durability
- Smoothness
- Coating adhesion
- Replication of every detail
- Extended die life

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



Residues from engraving (oxides)

Residues from polishing

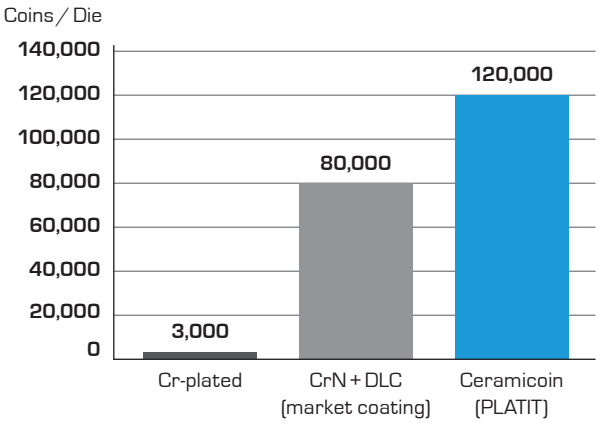


Material inhomo-geneities (pores or carbides)

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

Specifications

Color	satin silver
Nano-hardness [GPa]	32
Coefficient of friction [µ] PoD (at RT, 50% humidity)	0.4
Coating thickness [µm]	1
Max. service temperature [°C]	600
Coating temperature [°C]	200



Perfect replication solution of surface structures

Phantom color process
- Uses high-energy laser beams to create extremely fine and precise surface patterns that produce light-based color effects on both the coin stamp and the final coin
- Ceramicoin's ultra-thin, smooth coating (1 µm) protects the stamp while preserving the visual effects, ensuring the colors remain intact on both surfaces

Color-replicating 3D pattern stamps:
- The color pattern from the stamp is physically transferred onto the coin's surface during the minting process
- Previously, uncoated stamps were required for this effect, but they have a short lifespan
- With Ceramicoin coating by S-MPuls, the stamps prove a boost in lifespan while still preserving the color effect on the coins

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COMPENDIUM

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