

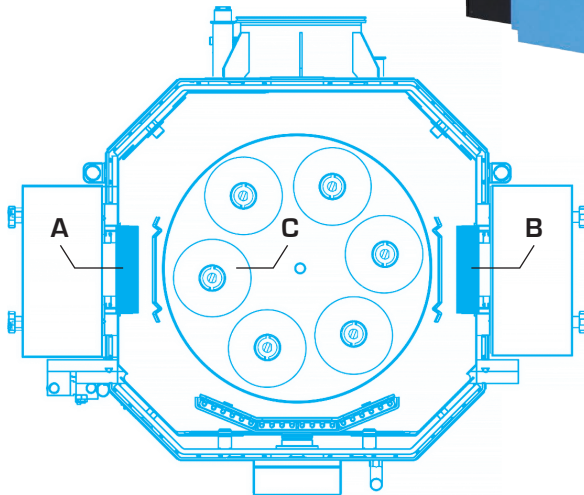
DLC SPUTTER Unit



PLATIT® 11 - Series

711 DLC SPUTTER Unit

- A Planar SPUTTER Cathode
- B Planar SPUTTER Cathode
- C Carousel



The PL711 is a compact SPUTTER coating unit based on HiPIMS technology (High Power Impulse Magnetron SPUTTERING). It's equipped with two Planar HiPIMS cathodes and allows for the deposition of selected nitride as well as carbon-based coatings (DLC2) using highly productive processes. Additionally, this coating unit is ideal for coating components that require low-temperature processes, ensuring high-quality coatings without compromising material integrity.



Technologies applied:

- 2 × Planar SPUTTER cathode with HiPIMS technology

Highlights

- Dense plasma with a high ionization degree in the carousel generates homogeneous coatings and reaches a high deposition rate
- Coatings from the PL711 provide outstandingly smooth surfaces with a high density, hardness and excellent adhesion.



Cathodes
2



Cycle
≥ 8.5 h



Max. Load
250 kg



Solution
Turnkey



Service
Worldwide



711 DLC SPUTTER Unit

Specifications

Etching technologies applied:

- LGD (Lateral Glow Discharge)
- Plasma etching with argon, glow discharge
- Metal ion etching (Ti, Cr)

Deposition types:

- SPUTTER nitride coatings
 - Reactive and non-reactive processes
 - Targets: Ti, Cr
 - Coating temperature up to 350°C
- SPUTTER Cr and PECVD a-C:H:Si
 - DLC2 (PECVD)
 - Targets: Cr
 - Coating temperature: 180 - 220 [°C]

Load and cycle times:

- Max. coating volume: \varnothing 600 × H 805 [mm]
- Max. coating height with defined coating thickness: 500 mm
- Max. load: 250 kg, higher weight upon request

Batch times PL711*:

Shank tools (2 μm):	\varnothing 8 × 70 [mm]	DLC2	540 pcs.	8.5 h
Molds and dies (3 μm):	$\leq \varnothing$ 150 × 150 [mm]	CrN	12 pcs.	12 h
Sliding mold inserts (3 μm):	25 × 150 × 10 [mm]	DLC2	72 pcs.	9–10 h

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

Modular carousel systems:

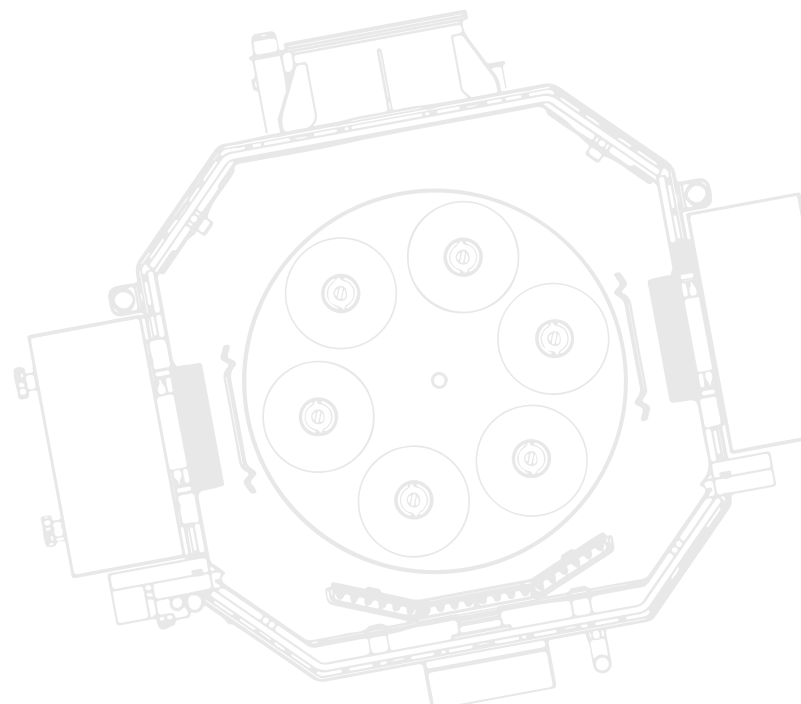
- 3 or 6 or 9 axes

Software:

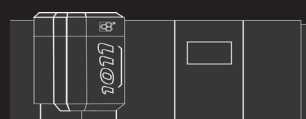
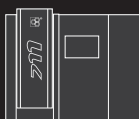
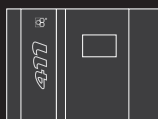
- Simple use and maintenance
- PLATIT SmartSoftware (PC and PLC system)
- Modern control system with touch screen
- Data recording and real-time display of process parameters and flow
- Manual and automatic process control
- Remote diagnostics and maintenance

Machine dimensions:

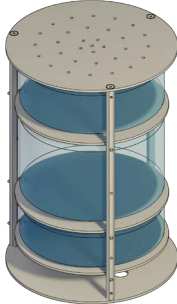
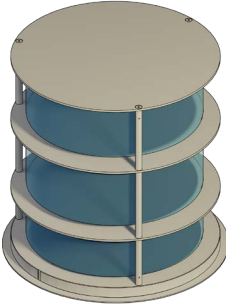
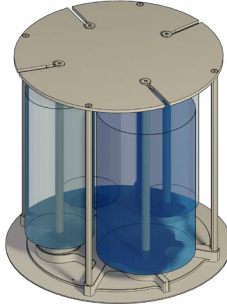
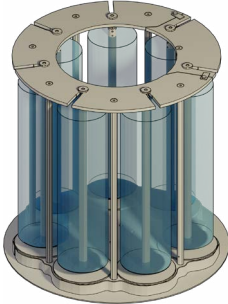

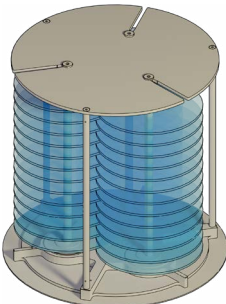
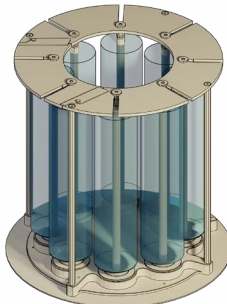
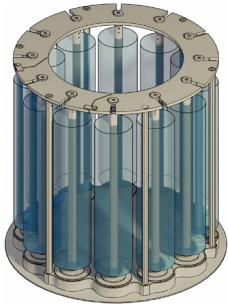
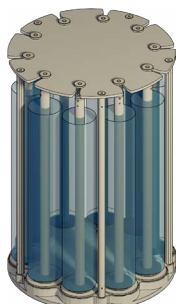
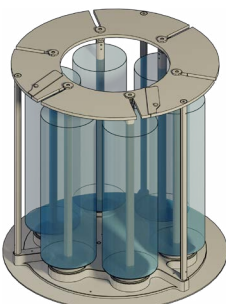
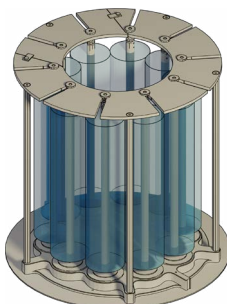
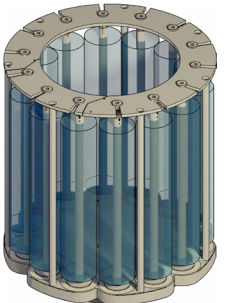
- Footprint: W 3,450 × D 2,250 × H 2,595 [mm]



11-SERIES ACCESSORIES



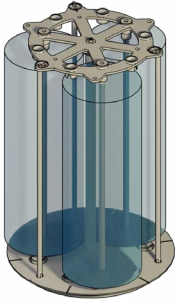
Carousels

	111	411		
Max. coatable height	498 mm	500 mm		
	 <p>Single rotation D ≤ 355 mm</p>	 <p>Single rotation D ≤ 500 mm for saw blades, D ≤ 460 mm for molds & dies</p>	 <p>4 asymmetric axes D3 ≤ 183 mm, D1 ≤ 250 mm</p>	 <p>7 axes for triple rotation for gearboxes D ≤ 143 mm</p>
	 <p>4 axes for continuous triple rotation for gearboxes D ≤ 143 mm</p>	 <p>3 axes for saw blades with overlap D ≤ 285 mm</p>	 <p>4/8 axes D4 ≤ 215 mm / D8 ≤ 115 mm</p>	 <p>6/12 axes D6 ≤ 145 mm / D12 ≤ 100 mm</p>
	 <p>10 axes for continuous double rotation D ≤ 77 mm</p>	 <p>3/6 axes D3 ≤ 220 mm / D6 ≤ 150 mm</p>	 <p>5/10 axes D5 ≤ 175 mm / D10 ≤ 94 mm</p>	 <p>14 axes D ≤ 85 mm</p>

Exemplary illustrations
Special carousels available upon request

711

805 mm



3 axes for kicker
 $D \leq 270$ mm



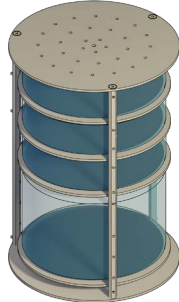
6 axes for kicker or gearboxes
 $D \leq 150$ mm



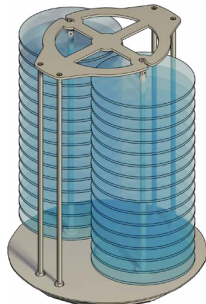
9 axes
 $D \leq 95$ mm

1011

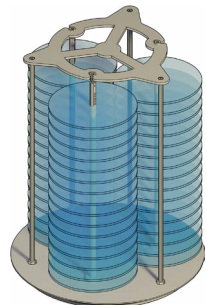
805 mm



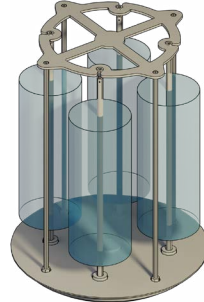
Single rotation
 $D \leq 715$ mm



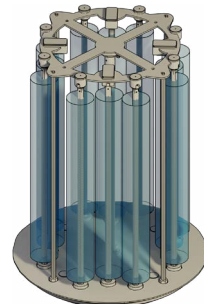
2 axes for saw blades with overlap
 $D \leq 450$ mm



3 axes for saw blades
 $D \leq 420$ mm with overlap,
 $D \leq 250$ mm without overlap



4 axes for kicker
 $D \leq 270$ mm



4/8/12 axes for kicker
 $D \leq 170$ mm



10 axes for gearboxes
 $D \leq 143$ mm

Holders



Disc with gears



Gearbox with triple rotation



Quad gearbox for quad rotation

Loading capacities

Pi111 G3

Tool type	Tool diameter	Tool length	Satellites	Discs / satellite	Holders / disc	Tools / holder	Tools / disc	Tools / batch	Holder type
Shank Tool	3 mm	50 mm	4	4	8	10	80	1,280	D
	6 mm	50 mm	4	4	5	9	45	720	G
	6 mm	50 mm	4	4	8	4	32	512	D
	6 mm	50 mm	4	4	18	1	18	288	A
	8 mm	60 mm	4	4	18	1	18	288	A
	10 mm	70 mm	4	4	18	1	18	288	A
	20 mm	100 mm	4	3	12	1	12	144	A
Insert	12 mm	4 mm	4	38	18	1	684	2,736	C
Hob	80 mm	100 mm	4	4	1	1	1	16	F
	75 mm	100 mm	10	4	1	1	1	40	F

Pi411 ECO

Tool type	Tool diameter	Tool length	Satellites	Discs / satellite	Holders / disc	Tools / holder	Tools / disc	Tools / batch	Holder type
Shank Tool	3 mm	50 mm	7	4	8	10	80	2,240	D
	6 mm	50 mm	7	4	5	9	45	1,260	G
	6 mm	50 mm	7	4	8	4	32	896	D
	6 mm	50 mm	7	4	18	1	18	504	A
	8 mm	60 mm	7	4	18	1	18	504	A
	10 mm	70 mm	7	4	18	1	18	504	A
	20 mm	100 mm	7	3	12	1	12	252	A
Insert	12 mm	4 mm	7	38	18	1	684	4,788	C
Hob	80 mm	100 mm	7	4	1	1	1	28	F
	80 mm	100 mm	14	4	1	1	1	56	F

PL711

Tool type	Tool diameter	Tool length	Satellites	Discs / satellite	Holders / disc	Tools / holder	Tools / disc	Tools / batch	Holder type
Shank Tool	6 mm	50 mm	6	5	5	9	45	1,350	G
	6 mm	50 mm	6	6	8	4	32	960	D
	6 mm	50 mm	6	6	18	1	18	540	A
	8 mm	60 mm	6	5	18	1	18	540	A
	10 mm	70 mm	6	5	18	1	18	432	A
	20 mm	100 mm	6	4	12	1	12	216	A
Insert	12 mm	4 mm	6	38	18	1	684	4,104	C
Molds & dies	160 mm	130 mm	3	4	1	1	1	12	F
Sliding parts with DLC2	25 × 10 mm	130 mm	3	4	4	1	1	48	F

PL1011 SAT

Tool type	Tool diameter	Tool length	Satellites	Discs / satellite	Holders / disc	Tools / holder	Tools / disc	Tools / batch	Holder type
Shank Tool	6 mm	50 mm	4	7	15	4	60	1,680	E
	6 mm	50 mm	4	7	42	1	42	1,176	B
	8 mm	60 mm	4	7	42	1	36	1,176	B
	10 mm	70 mm	4	6	42	1	30	1,008	B
	20 mm	100 mm	4	5	23	1	23	460	B
Insert	12 mm	4 mm	4	2 × 35	42	1	1470	11,760	C
Hob	140 mm	100 mm	10	6	1	1	1	60	F
	80 mm	100 mm	12	6	1	1	1	72	F

Holder type:

A Tool in a sleeve, driven by a gearbox

B Tool in a sleeve, driven by a kicker

C Insert with a hole, speared on a rod

D Tool in a revolver, driven by a gearbox

E Tool in a revolver, driven by a kicker

F Hob on a satellite / rod

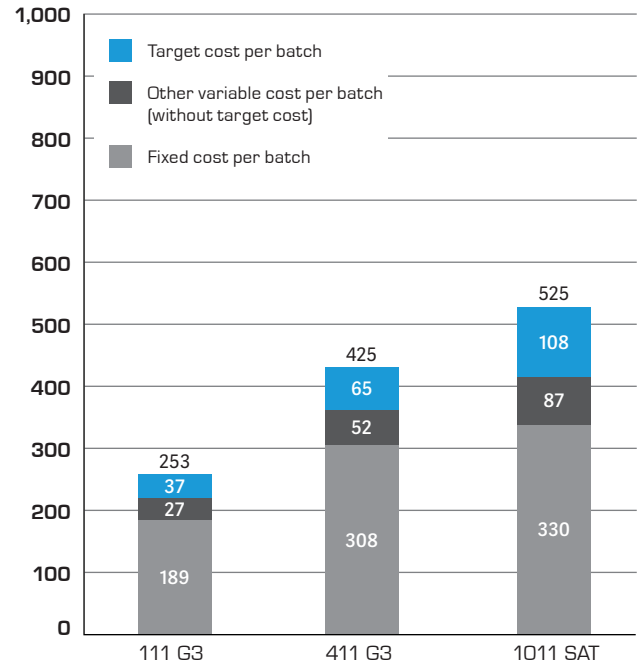
G Tool in a sleeve, driven by a quad gearbox

Process cost comparison

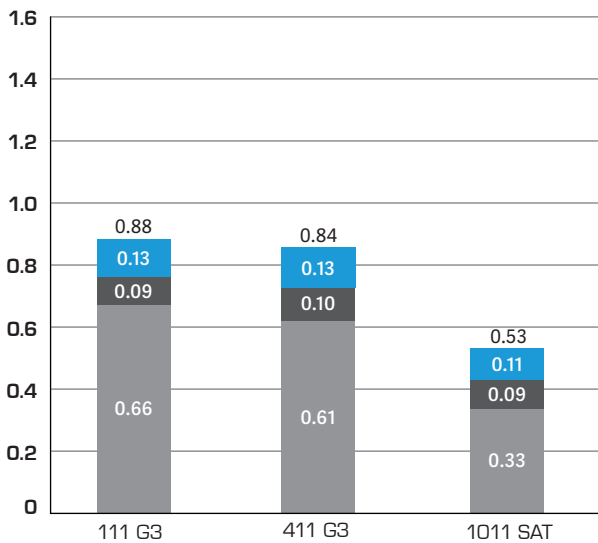
When calculating an investment in a PVD coating turnkey system, there are several variables to be taken into consideration. On this page we give you further insights about how fixed and variable costs add up for different PLATIT coating systems. We are using the case of a German SME coating 10 × 70 mm shank tools with three different coatings – AlTiN, Omnis and TiXCo3.

The diagram on the right visualizes that the majority of the batch costs of a PVD system are determined by the fixed costs. The main cost drivers are depreciation costs for the investment and the personnel costs for the operators. The variable costs, on the other hand, typically amount to less than one sixth of the total operating costs. In particular, the cost of the targets account for only 15–20% of the total cost per batch.

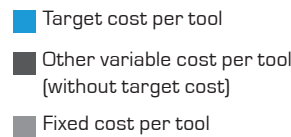
Cost per batch [CHF]:



Cost per tool [CHF]:



The diagram on the left visualizes the breakdown of cost per tool in different PLATIT coating systems. As it is shown in the diagram, the cost per tools decrease significantly in large-sized PVD coating units due to scale effects.



Detailed case description:
 German tool manufacturer, 10 × 70 mm shank tools
 Coatings: AlTiN (40 %), Omnis (40 %), TiXCo3 (20 %), 2µm on tool
 Costs included:
 Fixed costs: Investment in PVD system incl. production accessories, depreciation (8 years), operator wages (240 working days per year: 5am to 11pm), rental costs for space, unit maintenance
 Loading: Pi111 = 288 pc; Pi411 = 504 pc; PL1011 = 1008 pc.

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COMPENDIUM



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