

11

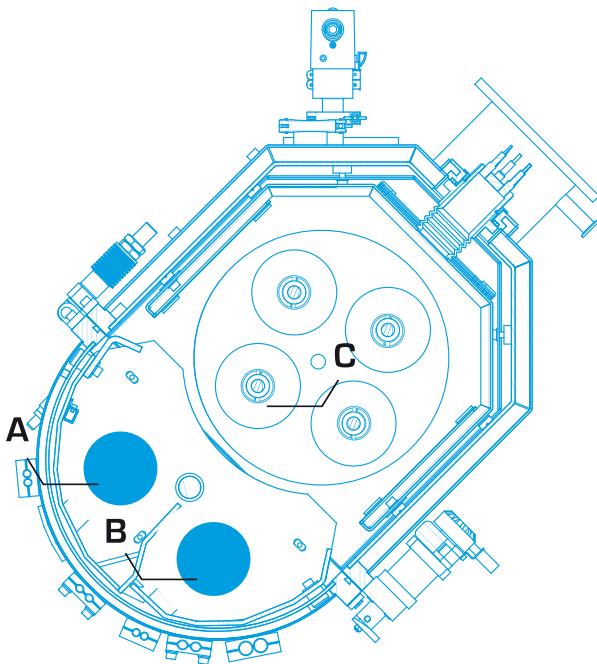
Family



PLATIT® 11 - Series

# 111 G3

- A LARC® PLUS Cathode
- B LARC® PLUS Cathode
- C Carousel



The Pi111 G3 represents the third generation of a compact PVD coating unit from PLATIT. Its key features are fast cycle times, easy operation and user-friendliness at a favorable price – without compromising coating performance. Having two rotating cathodes utilizing ARC technology, the unit deposits selected PLATIT Signature Coatings at a consistently high level of quality. It is the ideal choice for customers looking to enter the coating world or wanting to add a fast low-volume PVD system to their fleet of machines.



**Technologies applied:**

- 2 × LARC PLUS (Lateral Rotating PLUS Cathode) for ARC deposition
- Upgradable with TiCN option for DCL1 Coatings

**Highlights:**

- PLATIT Signature Technologies: Rotating Cathodes and LGD etching
- Selective cutting-edge PLATIT Signature Coatings on highest performance level
- Smart system: productive, fast and easy-to-use



**Cathodes**  
2



**Signature Coatings**



**Cycle**  
≥ 4 h



**Max. Load**  
160 kg



**Solution**  
Turnkey



**Service**  
Worldwide



# 111 Twin Rotary Magnetron

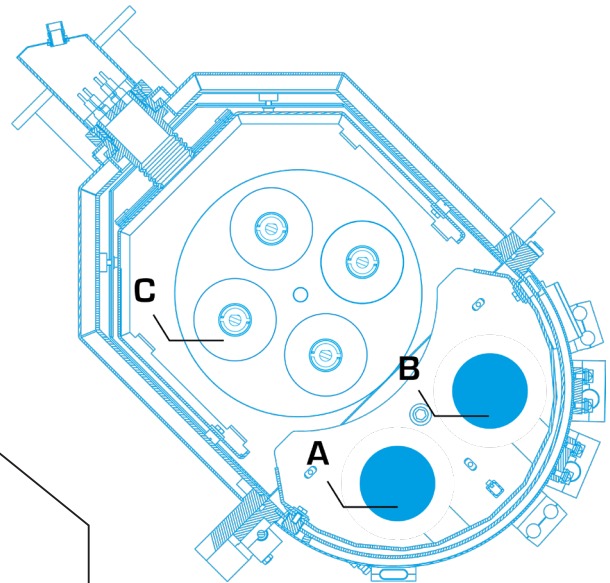


The Pi111 TRM (Twin Rotary Magnetron) is a state-of-the-art HiPIMS PVD coating unit featuring PLATIT's Twin Rotary Magnetron technology. Its two rotating sputter cathodes with advanced magnetron technology deliver dense, droplet-free coatings that are especially valuable for micro tools and demanding applications such as reamers and taps. The Pi111 TRM ensures superior coating performance and flexibility. Ideal for manufacturers seeking a fast, efficient sputtering machine with the latest technology at a reasonable cost, the Pi111 TRM is the perfect addition to any coating operation.





- A** LARC RM (Rotating Magnetron)
- B** LARC RM (Rotating Magnetron)
- C** Carousel



**Technologies applied:**

- 2 × LARC RM (Rotating Magnetron)

**Highlights:**

- High-powered rotating cathodes
- Wide range of materials and coatings to fit the applications needs
- Dense coatings thanks to the high power pulsing for challenging applications such as micro tools
- Smooth droplet free coatings
- Targets can include both metals and low or no electrical conductivity materials, such as ceramics
- Bi-pulse HiPIMS technology provides active control of pulse and ion distribution, making even low-temperature processes possible
- Generation of highly energetic ions with strong impact for excellent coating adhesion and properties

**Cathodes**  
2



**Signature**  
Coatings



**Cycle**  
≥ 4 h



**Max. Load**  
160 kg



**Solution**  
Turnkey



**Service**  
Worldwide



# 111 Family

## Specifications

### 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: 353 × H 498 [mm]
- Max. coating height with defined coating thickness: 414 mm (Pi111 G3), 380 mm (Pi111 TRM)
- Max. load: 160 kg

### Batch times Pi111 G3\*:

<b>Shank tools (2 µm):</b>	∅ 10 × 70 [mm]	288 pcs.	4–5 h
<b>Inserts (3 µm):</b>	∅ 12 × 4 [mm]	2,736 pcs.	5–6 h
<b>Hobs (4 µm):</b>	∅ 75 × 120 [mm]	30 pcs.	6–7 h

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

### Batch times Pi111 TRM\*:

<b>Micro tools (0.5 µm):</b>	∅ 3 × 50 [mm]	1,280 pcs.	≈ 4 h
<b>Shank tools (2 µm):</b>	∅ 10 × 70 [mm]	288 pcs.	≈ 6 h

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

### Modular carousel systems:

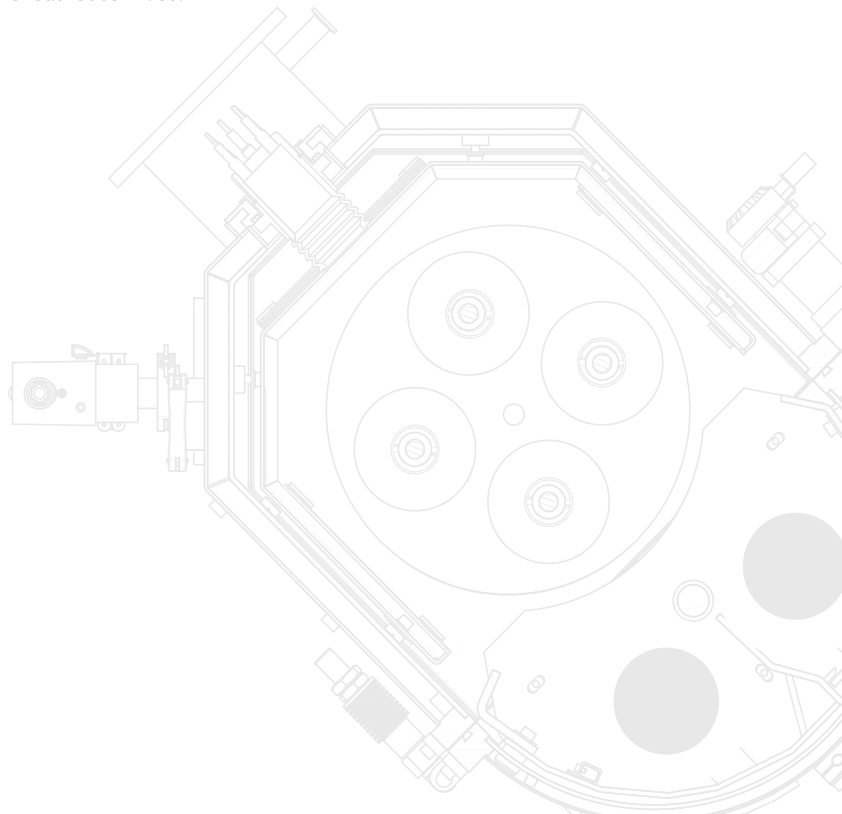
- 1 or 4 or 10 axes

### Software:

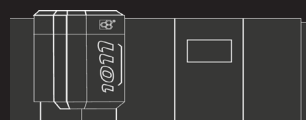
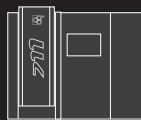
- Simple use and maintenance
- PLATIT SmartSoftware (PC and PLC system)
- Modern control system with touch screen
- Data recording and real-time display of process parameters and flow
- Manual and automatic process control
- Remote diagnostics and maintenance

### Machine dimensions:

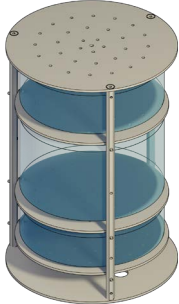
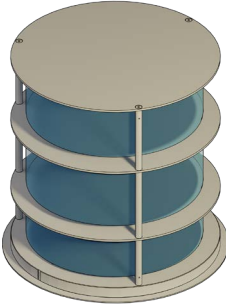
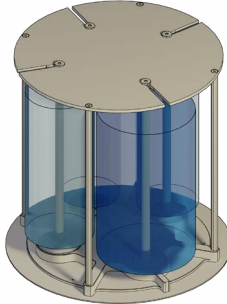
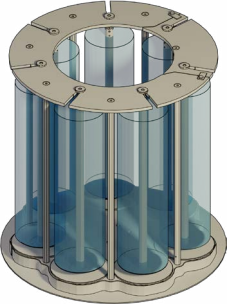

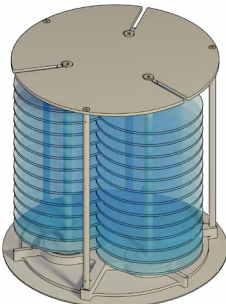
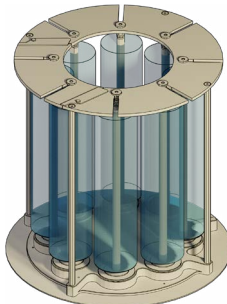
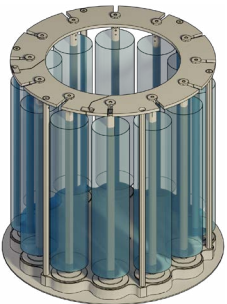
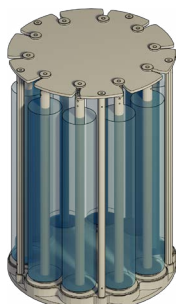
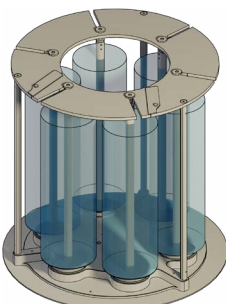
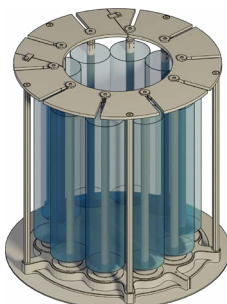
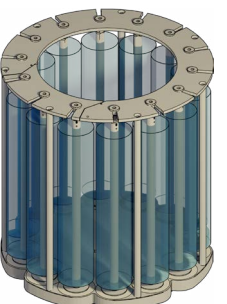
- Footprint: W 1,930 × D 1,560 × H 2,220 [mm]



# 11-SERIES ACCESSORIES



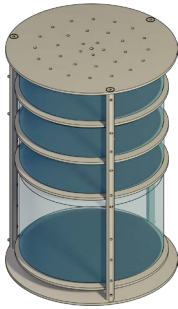
# Carousels

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

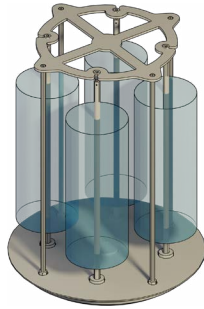
Exemplary illustrations  
Special carousels available upon request

## 1011

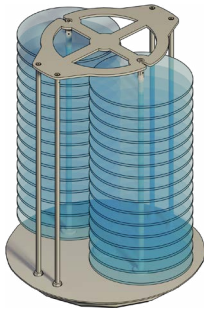
805 mm



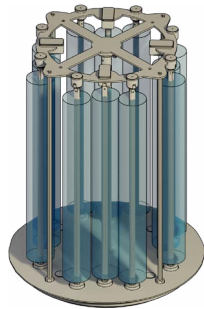
**Single rotation**  
D ≤ 715 mm



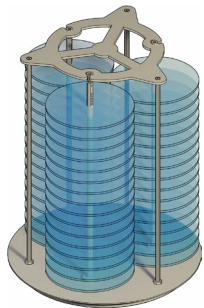
**4 axes for kicker**  
D ≤ 270 mm



**2 axes for saw blades with overlap**  
D ≤ 450 mm



**4/8/12 axes for kicker**  
D ≤ 170 mm

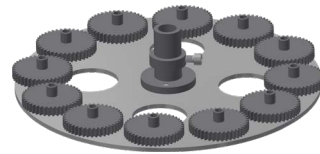


**3 axes for saw blades**  
D ≤ 420 mm with overlap,  
D ≤ 250 mm without overlap



**10 axes for gearboxes**  
D ≤ 143 mm

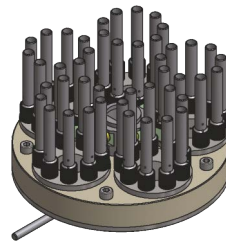
## HOLDERS



**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
Mirco Tool	3 mm	48 mm	4	4	8	10	80	1,280	H
	6 mm	48 mm	4	4	8	6	48	768	H
Shank Tool	3 mm	50 mm	4	5	8	10	80	1,600	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	75 mm	120 mm	10	3	1	1	1	30	F
	140 mm	120 mm	4	3	1	1	1	12	F

## Pi111 TRM

Tool type	Tool diameter	Tool length	Satellites	Discs/ satellite	Holders/ disc	Tools/ holder	Tools/ disc	Tools/ batch	Holder type
Mirco Tool	3 mm	48 mm	4	4	8	10	80	1,280	H
	6 mm	48 mm	4	4	8	6	48	768	H
Shank Tool	3 mm	50 mm	4	4	8	10	80	1,280	D
	6 mm	50 mm	4	3	5	9	45	540	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	3	18	1	18	216	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	75 mm	120 mm	10	3	1	1	1	30	F
	140 mm	120 mm	4	3	1	1	1	12	F

## Pi411 ECO

Tool type	Tool diameter	Tool length	Satellites	Discs / satellite	Holders / disc	Tools / holder	Tools / disc	Tools / batch	Holder type
Micro Tool	3 mm	48 mm	7	4	8	10	80	2,240	H
	6 mm	48 mm	7	4	8	6	48	1,344	H
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	120 mm	14	3	1	1	1	42	F
	140 mm	120 mm	7	3	1	1	1	21	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	120 mm	120 mm	12	6	1	1	1	72	F
	140 mm	120 mm	10	6	1	1	1	60	F

### Holder type:

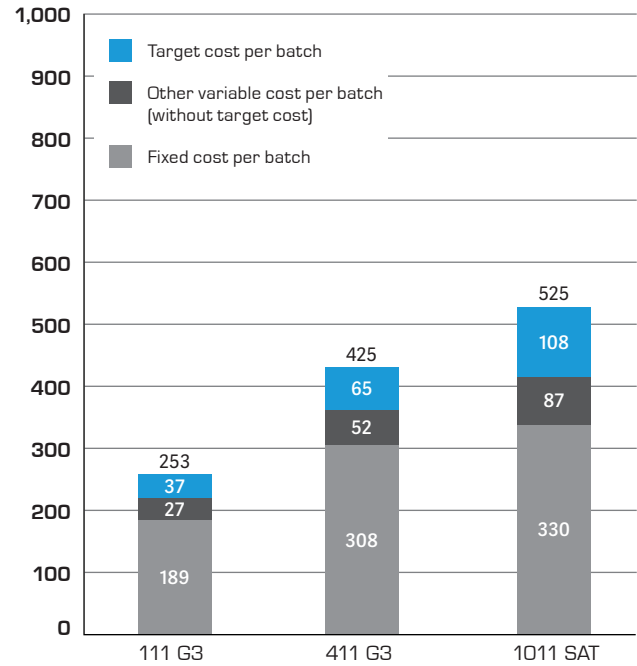
- A Tool in a sleeve, driven by a gearbox
- B Tool in a sleeve, driven by a kicker
- C Insert with a hole, speared on a rod
- D Tool in a revolver, driven by a gearbox
- E Tool in a revolver, driven by a kicker
- F Hob on a satellite / rod
- G Tool in a sleeve, driven by a quad gearbox
- H Tool in a micro tool holder, driven by a gearbox

# Process cost comparison

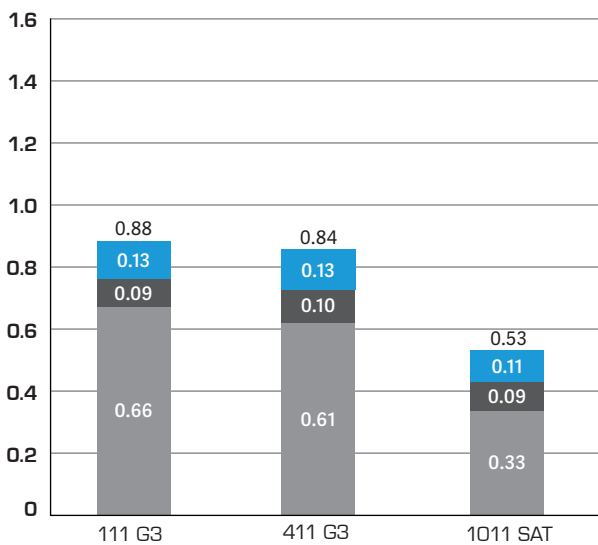
When calculating an investment in a PVD coating turnkey system, there are several variables to be taken into consideration. On this page we give you further insights about how fixed and variable costs add up for different PLATIT coating systems. We are using the case of a German SME coating 10 × 70 mm 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 accounts for only 15–20% of the total cost per batch.

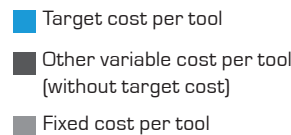
Cost per batch [CHF]:



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 decreases 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



Advanced Coating Systems  
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