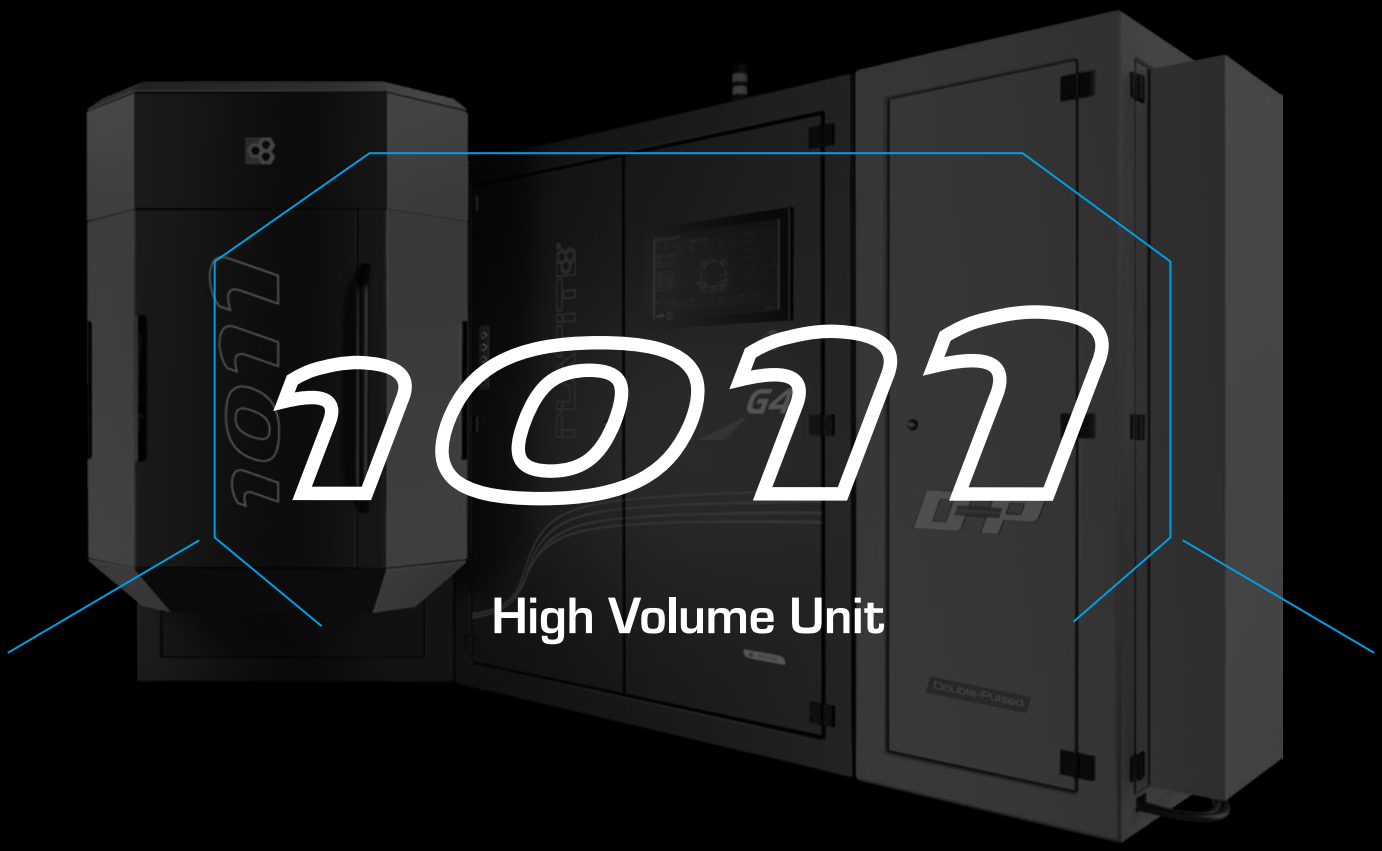


1011

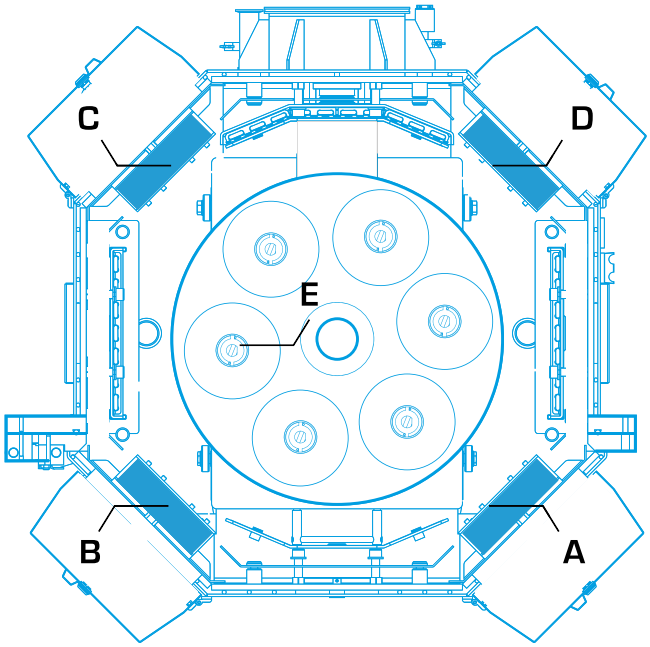
High Volume Unit

AR

PLATIT® 11 - Series

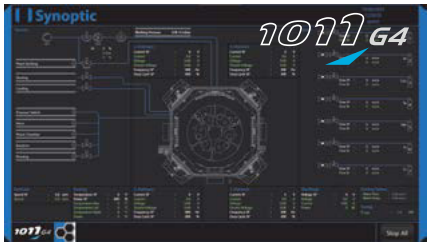
1011 G4 High Volume Unit

As the backbone of every high-volume coating center, PL1011 G4 combines maximum production availability with a user-friendly interface and an efficient maintenance concept. It's equipped with four Planar cathodes utilizing the latest ARC technology for the deposition of all PLATIT standard coatings in consistently high quality.



A Planar Cathode
B Planar Cathode
C Planar Cathode
D Planar Cathode
E Carousel

The PL1011 G4 represents the next generation of a robust PVD coating unit from PLATIT for customers who seek a combination of process reliability and high-quality coatings at a low cost per tool. Its new design speaks for changes and modernization: the simpler construction enables better service; the new technological features such as the Plasma-Nitriding and Double-Pulsed options improve the coating properties and process for various applications.



Technologies applied:

- 4 × Planar cathode using ARC technology for depositing
- Double-Pulsed
- Plasma-Nitriding

PLATIT®

Targets	Signature	Double	Plasma	Cycle	Max. Load	Solution	Service
4	Coatings	Pulsed	Nitriding	≥ 7 h	750 kg	Turnkey	Worldwide

1011 G4 High Volume Unit

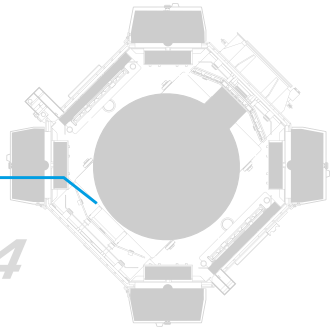
Plasma-Nitriding feature

The PL1011 G4 with Plasma-Nitriding features a thermochemical plasma nitriding process integrated in the PVD coating process. After loading, a high vacuum is created, the chamber is heated, then the substrates are nitrided, a proprietary PLATIT etching process is switched on, and only then the suitable PVD coating is deposited.

Plasma nitriding builds a hardness gradient underneath the PVD coating to ensure homogeneous transition from the relatively soft substrate to the very hard PVD layer. This transition is the major challenge in metal forming applications with standard cold forming steels such as 1.2379 / D2.

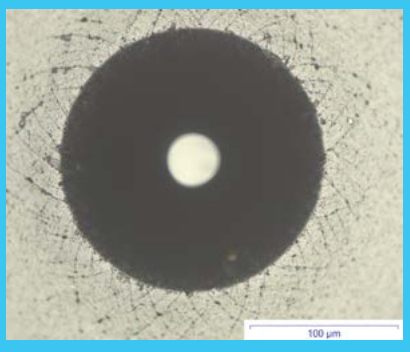
Highlights:

- Better coating adhesion
- Increased substrate surface hardness
- Improved wear resistance as well as resistance to deformation of the nitrided substrate
- Extending production lifetime of molds and dies, in turn lowering tooling costs

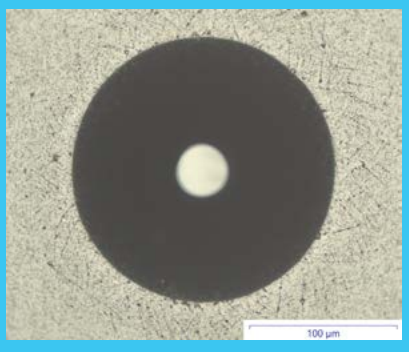


Comparison of AlCrN

1011 G4



AlCrN, deposited on standard substrate



AlCrN, deposited on nitrided substrate

Improved coating adhesion and less plastic deformation due to increased substrate hardness.

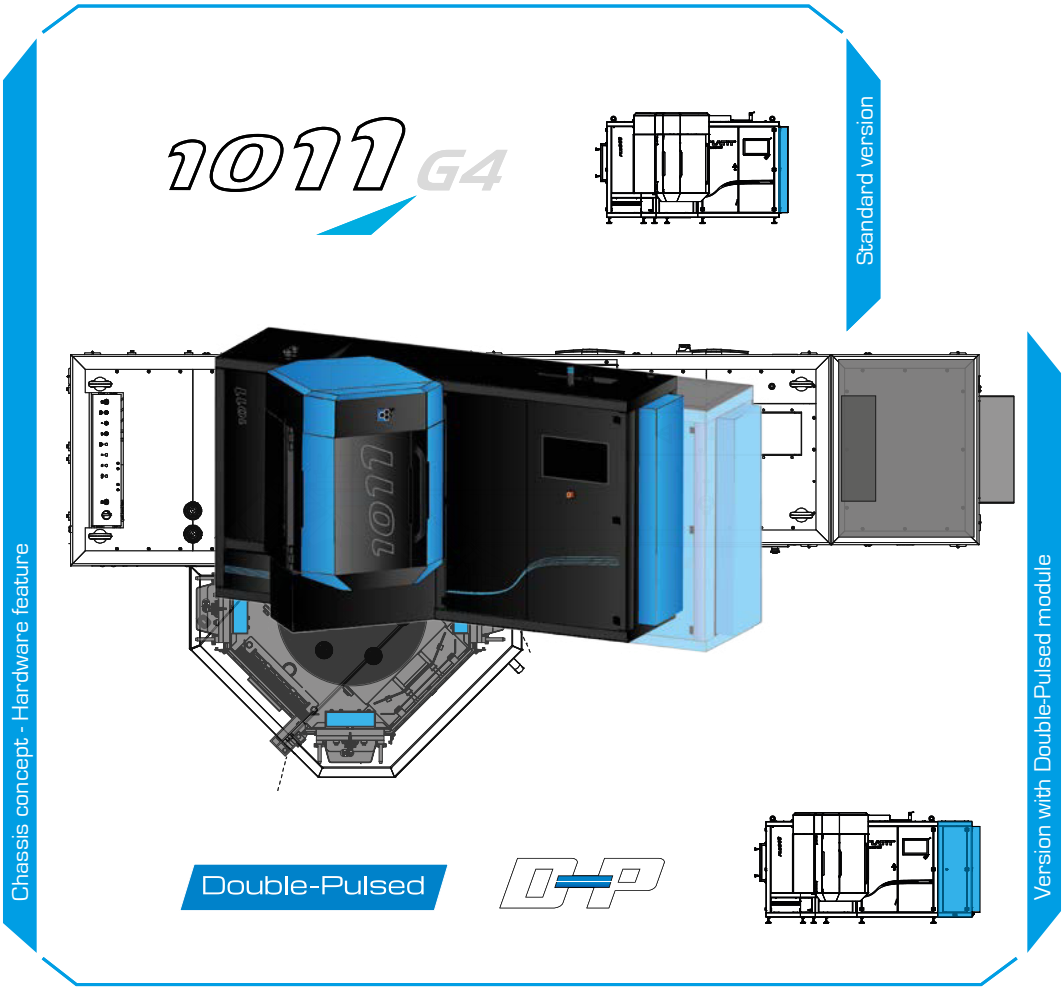
Double-Pulsed feature

PLATIT PL1011 G4 with Double-Pulsed feature is intended for customers with large coating volumes demanding the highest possible throughput.
While faster deposition rates often result in rougher coatings, PL1011 G4 Double-Pulsed does not sacrifice either coating quality or surface finish, keeping all the advantages of ARC processes.

With an extended power supply bank, PL1011 G4 Double-Pulsed allows eight ARC power supplies to run simultaneously in both DC and pulsed modes, with a wider race track on the target leading to an improved target utilization.

Highlights:

- Advanced ARC technology results in high productivity with 30 % faster coating deposition time
- Excellent coating quality and surface finish
- Improved target utilization



1011 G4 High Volume Unit

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

3 – 4 batches / day for*:

Shank tools (2 µm):	ø 8 × 70 [mm]	1,008 pcs.	7 – 8 h
Inserts (3 µm):	ø 12 × 4 [mm]	11,760 pcs.	9 – 10 h
Hobs (4 µm):	ø 80 × 180 [mm]	36 pcs.	7 – 8 h
Hobs (4 µm):	ø 80 × 100 [mm]	72 pcs.	7 – 8 h

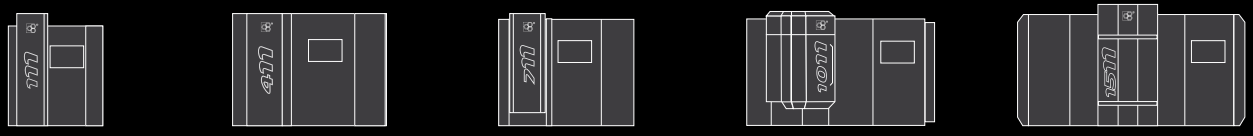
* Durchschnittliche Zykluszeiten in einer laufenden Produktion mit einer maximalen Anzahl von Kathoden im Einsatz.

Modular carousel systems:
- 1 to 12 axes

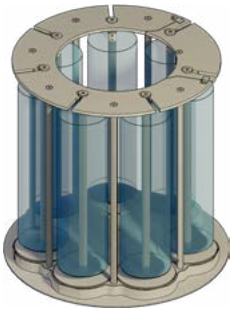
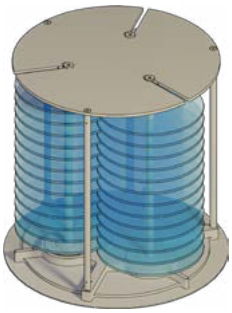
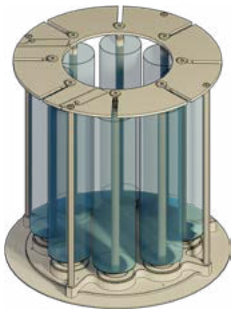
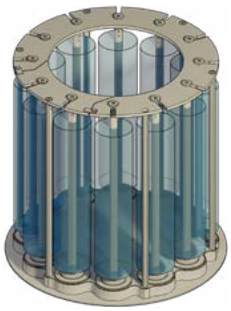
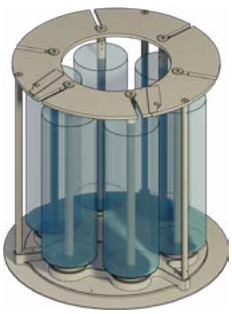
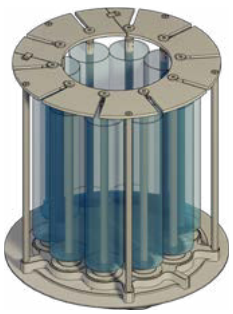
Software:
- PLATIT SmartSoftware (PC and PLC system) with touch screen
- Statistics and help function via user interface
- Data recording and real-time display of process parameters and flow
- Manual and automatic process control
- Remote diagnostics and maintenance
- Newly designed recipe editor

Machine dimensions:
- Footprint: W 4,000 × D 2,250 × H 2,350 [mm]
- Footprint Double-Pulsed option: W 4,700 × D 2,250 × H 2,350 [mm]

11-SERIES ACCESSORIES



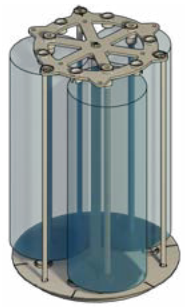
Carousels

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

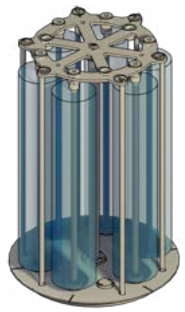
Exemplary illustrations

711

805 mm



3 axes for kicker
D ≤ 270 mm



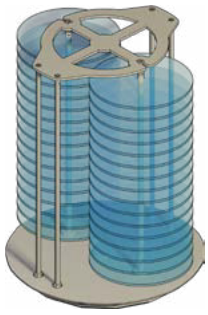
6 axes for kicker or gearboxes
D ≤ 150 mm

9 axes for kicker
D ≤ 95 mm

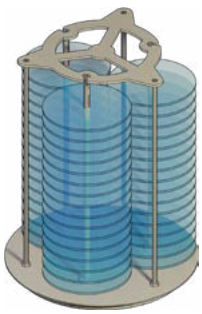
1011

805 mm

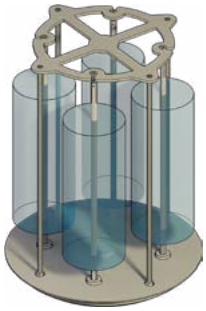
Single rotation
D ≤ 700 mm



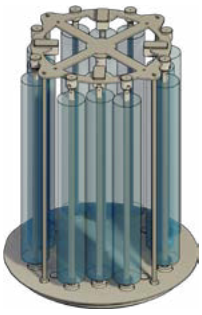
2 axes for saw blades with overlap
D ≤ 450 mm



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



4 axes for kicker
D ≤ 270 mm



4 / 8 / 12 axes for kicker
D ≤ 170 mm

10 axes for gearboxes
D ≤ 143 mm

Holders

Disc with gears

Gearbox with triple rotation

Quad gearbox for quad rotation

Loading capacities

Pi111

Tool type	Tool diameter	Tool length	Satellites	Discs / satellite	Holders / disc	Tools / holder	Tools / disc	Tools / batch	Holder type
Shaft Tool	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

Tool type	Tool diameter	Tool length	Satellites	Discs / satellite	Holders / disc	Tools / holder	Tools / disc	Tools / batch	Holder type
Shaft Tool	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
Shaft Tool	6 mm	50 mm	6	5	5	9	45	1,350	G
	6 mm	50 mm	6	6	8	4	32	1,152	D
	6 mm	50 mm	6	6	18	1	18	648	A
	8 mm	60 mm	6	5	18	1	18	540	A
	10 mm	70 mm	6	5	18	1	18	540	A
	20 mm	100 mm	6	4	12	1	12	288	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	4	48	F

PL1011

Tool type	Tool diameter	Tool length	Satellites	Discs / satellite	Holders / disc	Tools / holder	Tools / disc	Tools / batch	Holder type
Shaft 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	36	1	36	1,008	B
	10 mm	70 mm	4	6	30	1	30	720	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

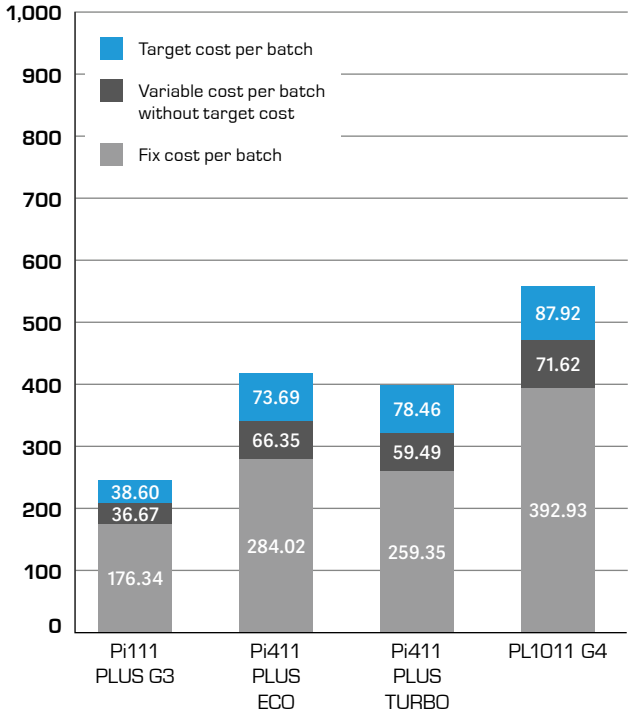
Holder type:
A Tool in a sleeve, driven by a gearbox
B Tool in a sleeve, driven by a kicker
C Insert with a hole, speared on a rod
D Tool in a revolver, driven by a gearbox
E Tool in a revolver, driven by a kicker
F Hob on a satellite / rod
G Tool in a sleeve, driven by a quad gearbox

Process cost comparison

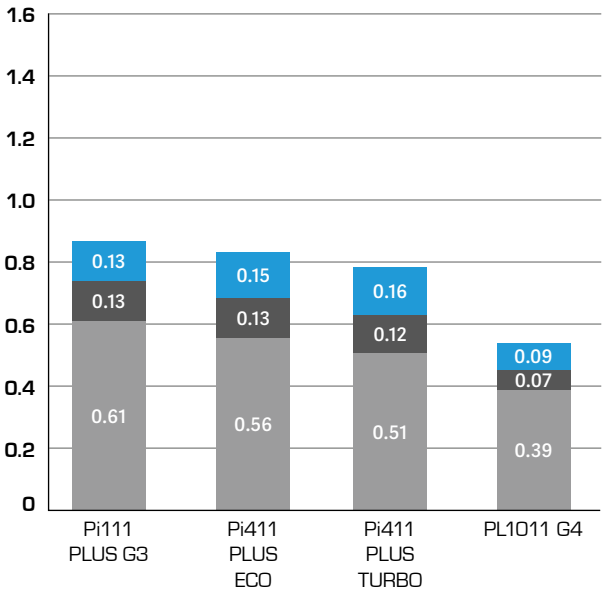
When calculating an investment in a PVD coating turnkey system, there are several variables to be taken into consideration. On this page we give you further insights about how fixed and variable costs add up for different PLATIT coating systems. We are using the case of a German SME coating 10 × 70 mm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

Target cost per tool

Variable cost per tool (without target cost)

Fixed cost per tool

Detailed case description:
German tool manufacturer, 10 × 70 mm shank tools
Coatings: AlTiN (40 %), Omnis (40 %), TiXCo3 (20 %)
Costs included:
Fixed costs: Investment in PVD system incl. production accessories, depreciation (8 years, 240 working days per year), operator wages, rent and maintenance
Other variable costs: energy and chemicals

VISIT US AT: WWW.PLATIT.COM

PLATIT AG
Headquarters
Eichholzstrasse 9
CH-2545 Selzach
info@platit.com
+ 41 32 544 62 00

PLATIT AG
Custom Coating Solutions (CCS)
Champ-Paccot 21
CH-1627 Vaulruz
info@platit.com
+41 32 544 62 00

PLATIT a.s.
Production, R&D, Service, CEC
Průmyslová 3020 / 3
CZ-78701 Šumperk
info@platit.com
+ 420 583 241 588

PLATIT Advanced Coating Systems (Shanghai) Co., Ltd
Sales, Service, CEC
No. 161 Rijing Road (Shanghai) PFTZ
CN-200131 Pudong Shanghai
china@platit.com
+ 86 2158 6739 76

PLATIT Inc.
Sales, Service, CEC
1840 Industrial Drive, Suite 220
Libertyville, IL 60048, US
usa@platit.com
+ 1 847 680 5270
Fax: + 1 847 680 5271

PLATIT Scandinavia ApS
Sales
Rabalderstraede 7
DK-4000 Roskilde
scandinavia@platit.com
+ 45 46 74 02 38

COMPENDIUM

64

PLATIT®
Advanced Coating Systems
SWISS QUALITY