# PLATIT®

THE LEGEND – RELOADED


NEW

- Double-Pulsed DP
- Plasma-Nitriding
- New Software

Advanced Coating Systems

# 1011 G4 High Volume Unit

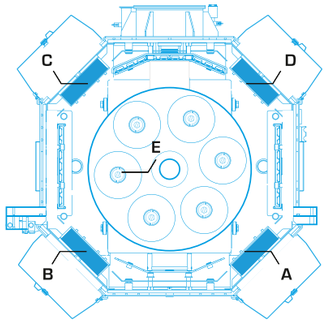
## The Legend – Reloaded

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.

PLATIT® 1011 G4

Advanced Coating Systems

PL1011 G4 with Double-Pulsed Option

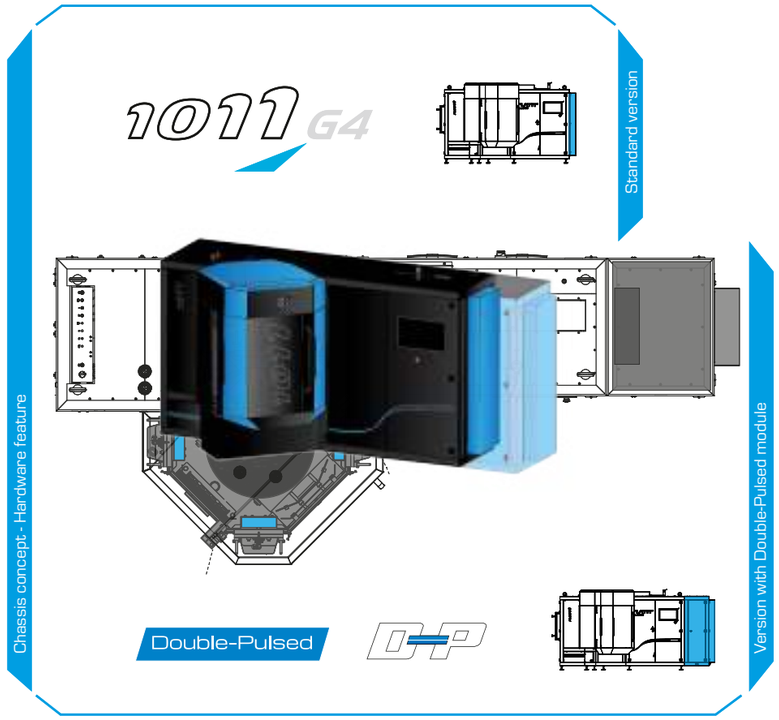

**A** Planar Cathode
**B** Planar Cathode
**C** Planar Cathode
**D** Planar Cathode
**E** Carousel

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.

## Technological Features

**Double-Pulsed feature:**

PLATIT PL1011 G4 with Double-Pulsed feature is intended for customers with large coating volumes demanding the highest possible throughput. Thanks to advanced ARC technology the machine delivers high deposition rates resulting in high productivity. Our PL1011 G4 Double-Pulsed feature reduces coating deposition time by 30%, which enables a gain of up to one additional batch per day.
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:**
- High productivity with 30% faster coating deposition time thanks to the dedicated ARC technology
- Excellent coating quality and surface finish
- Improved target utilization

# 1011 G4

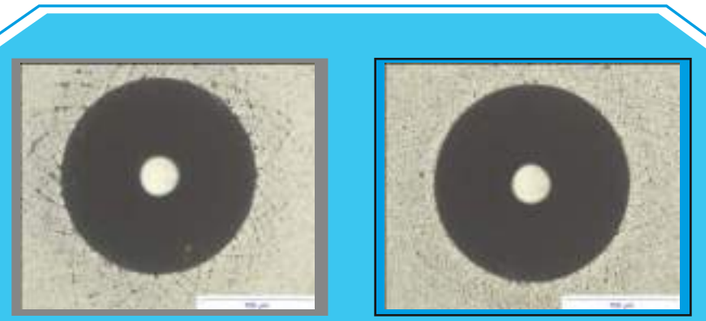


## Plasma-Nitriding feature:

For improved coating adhesion, increased surface hardness, resilience and wear resistance of forming tools, the PL1011 G4 with Plasma-Nitriding features a thermochemical plasma nitriding process integrated in the PVD coating process. This is carried out in the same batch, in the same vacuumed coating chamber. 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 is the suitable PVD coating 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. Improving the crack resistance of the dedicated PLATIT PVD coating will increase the lifetime of your tool.

**Comparison of AlCrN**

1011 G4



AlCrN, deposited on standard substrate

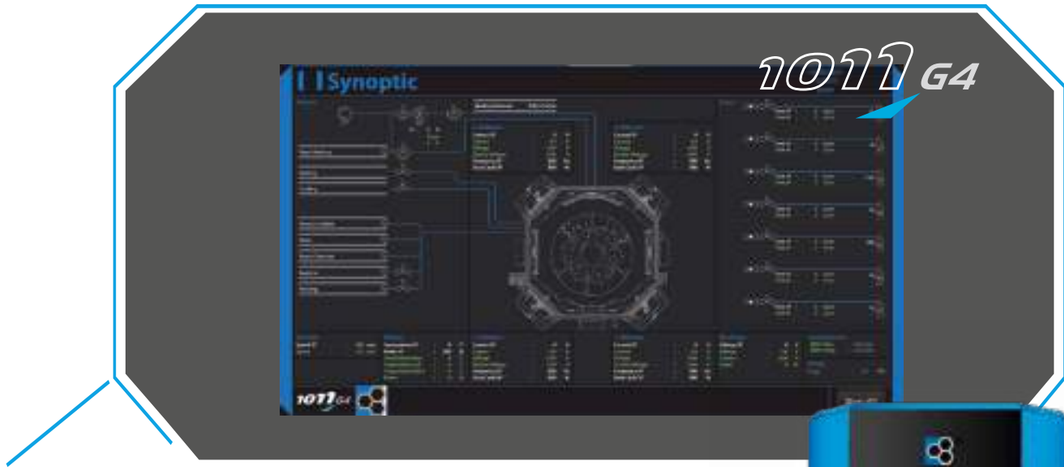
AlCrN, deposited on nitrided substrate

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

**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








## Newly developed software:

The PL1011 G4 comes with a brand-new HMI providing a self-explaining overview at first glance. Working with the new HMI the operator will be guided through all tasks that need to be completed before starting the coating process. A real-time display of all process parameters, statistics of previous batches and an easy-to-use help function including remote diagnostics and maintenance via the HMI will support a variety of operational tasks. Even developing and editing recipes gets easier with the integrated recipe editor. All in one screen.

**Technologies applied:**
- 4 x 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 | ≥ 5.5 h | 400 kg | Turnkey | Worldwide |

# 1011 G4

## Facts and figures

### Cathode configurations and coating properties

| Coating | Color | Nano-hardness [GPa] by Fisher Nanoindentor | Coating thickness [µm] | Coefficient of friction [µ] PoD (at RT, 50% humidity) | Max. service temperature [°C] |
|---|---|---|---|---|---|
| TiN (Ti, -, Ti, -) | Gold | 24–26 | 1–10 | 0.4 | 600 |
| TiCN (Ti, -, Ti, -) | Grey | 36–38 | 1–3 | 0.25 | 450 |
| TiAlN (Ti, AlTi40, TiAl50, AlTi40) | Violet grey | 36–38 | 1–5 | 0.5 | 700 |
| TiAlCN (Ti, TiAl25, Ti, TiAl25) | Red violet | 34–36 | 1–5 | 0.25 | 450 |
| AlTiN (Ti, AlTi40, AlTi33, AlTi40) | Blue grey | 36–38 | 1–5 | 0.6 | 900 |
| CrN (Cr, -, Cr, -) | Silver | 21–23 | 1–10 | 0.5 | 700 |
| CrTiN (Ti, Cr, Ti, Cr) | Satin silver | 28–30 | 1–10 | 0.4 | 700 |
| ZrN (Ti, Zr, Ti, Zr) | White gold | 21–23 | 1–5 | 0.4 | 550 |
| AlCrN (Cr, AlCr35, AlCr35, AlCr35) | Grey | 36–38 | 1–5 | 0.5 | 900 |
| AlTiCrN (Cr, AlTi40, AlCr35, AlTi40) | Grey | 36–38 | 1–5 | 0.5 | 900 |
| ALL4 (Cr, AlCr35, AlCrTi25-10, AlCr35) | Grey | 36–38 | 1–5 | 0.5 | 900 |
| nACo (Ti, AlTi40, AlTiSi30-10, AlTi40) | Blue violet | 39–41 | 1–4 | 0.4 | 1200 |
| TiXCo3 (Ti, AlTi40, TiSi20, AlTi40) | Copper | 42–44 | 1–4 | 0.4 | 900 |
| PSiX (Ti, AlTi40, TiSi20, AlTi40) | Red brown | 42–44 | 1–4 | 0.4 | 1100 |
| DLC1: TiCN + a-C:H:Me (Ti, -, Ti, -) | Anthracite | 36 / 20 | 1–3 | 0.1 – 0.2 | 400 |

The given physical values may vary for different coating structures (mono-, gradient-, multi- and nanolayers).
Selected coatings available with Double-Pulsed and Plasma-Nitriding features.

### Loading Capacities

| Coating unit | Tool type | Tool diameter | Tool length | Satellites | Discs/ satellite | Holders/ disc | Tools/ holder | Tools/ disc | Tools/ batch |
|---|---|---|---|---|---|---|---|---|---|
| PL1011 | Shank tool | 6 mm | 50 mm | 4 | 8 | 23 | 4 | 92 | 2944 |
| | | 6 mm | 50 mm | 4 | 8 | 42 | 1 | 18 | 1344 |
| | | 8 mm | 60 mm | 4 | 7 | 42 | 1 | 42 | 1176 |
| | | 10 mm | 70 mm | 4 | 6 | 42 | 1 | 42 | 1008 |
| | | 20 mm | 100 mm | 4 | 4 | 36 | 1 | 36 | 576 |
| | Insert | 20 mm | 6 mm | 4 | 2 | 36 | 30 | 1080 | 8640 |
| | Hob | 80 mm | 120 mm | 12 | 6 | 1 | 1 | 1 | 72 |
| | | 80 mm | 180 mm | 12 | 4 | 1 | 1 | 1 | 48 |

**Legend**

Tool in a sleeve, driven by a kicker | Tool in a revolver, driven by a kicker | Insert with a hole, speared on a rod | Hob on a satellite

## 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 x H 805 [mm]
- Max. coating height with defined coating thickness: 711 mm
- Max. load: 400 kg

| 3–4 batches/day for *: | | | |
|---|---|---|---|
| Shank tools (2 µm): | ø 10 x 70 [mm] | 1008 pcs. | 5.5–7 h |
| Inserts (3 µm): | ø/□ 20/14 x 6 [mm] | 8640 pcs. | 6.5–7.5 h |
| Hobs (4 µm): | ø 80 x 180 [mm] | 48 pcs. | 6.5–7.5 h |

* Average cycle times for a typical coating mix in a production environment. Faster coating times with PL1011 G4 Double-Pulsed

**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 4000 x D 2250 x H 2350 [mm]
- Footprint Double-Pulsed option: W 4700 x D 2250 x H 2350 [mm]

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