

PLATEG.NITRIDE PRODUCT FAMILY

MAXIMUM PRECISION IN TEMPERATURE UNIFORMITY





PlaTeG.Nitride 700
as tandem plant type
with two separate
chambers.

OUR ORIGINS

PLATEG

THE IMPULSE GENERATORS

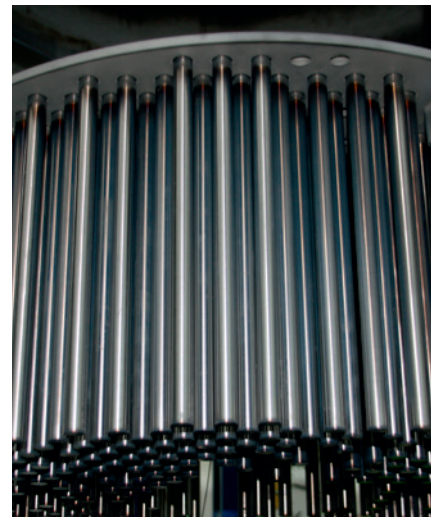
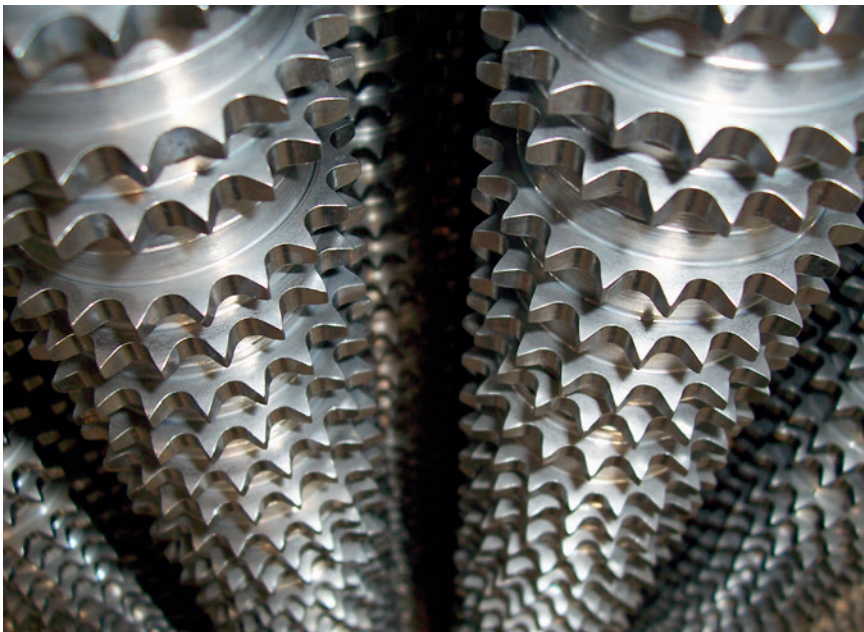
With over 40 years of expertise in vacuum system design and construction, PVA Industrial Vacuum Systems GmbH specializes in producing cutting-edge PlaTeG – PulsPlasma® Nitriding (PPN) systems. These advanced solutions are designed for the surface treatment of a wide range of metallic components and complex geometries. Our systems enhance key properties such as hardness, wear and corrosion resistance, heat resistance, and fatigue strength.

APPLICATIONS & INDUSTRIES

FROM TOOLING TO AEROSPACE

PlaTeG PulsPlasma® Nitriding systems are ideally suited for the treatment of a wide variety of components made of steel, sintered iron, cast iron, titanium and aluminum. They are successfully used in the following industries:

- **Commercial Heat Treatment Shops**
Treats components like gears, shafts, and molds to enhance hardness, wear resistance, and fatigue strength.
- **Mechanical and Plant Engineering**
Improves wear resistance, corrosion protection, and service life for hydraulic cylinders, spindles, and drive shafts.
- **Tool and Mold Manufacturing**
Enhances surface hardness, reduces friction, and extends tool life for cutting tools, stamping dies, and molds.
- **Gear Manufacturing**
Strengthens gear wheels in applications like machinery and wind turbines, improving fatigue resistance and wear performance under high loads.
- **Automotive Industry**
Increases durability and efficiency for engine and power train parts like crankshafts and camshafts.
- **Aerospace Industry**
Boosts fatigue resistance for turbine blades, landing gear, and fasteners.
- **Offshore Industry**
Protects subsea fasteners and pump components from fretting, corrosion and wear in harsh marine environments.
- **Plastics Industry**
Enhances hardness and wear resistance of screw barrels, and molds used in plastic injection molding.
- **Power Plant Industry**
Improves durability and reduces friction for turbine components, valve stems, and pump shafts in extreme conditions.
- **Medical Technology**
Enhances performance for surgical instruments, implants, and medical devices.



THE TECHNOLOGY

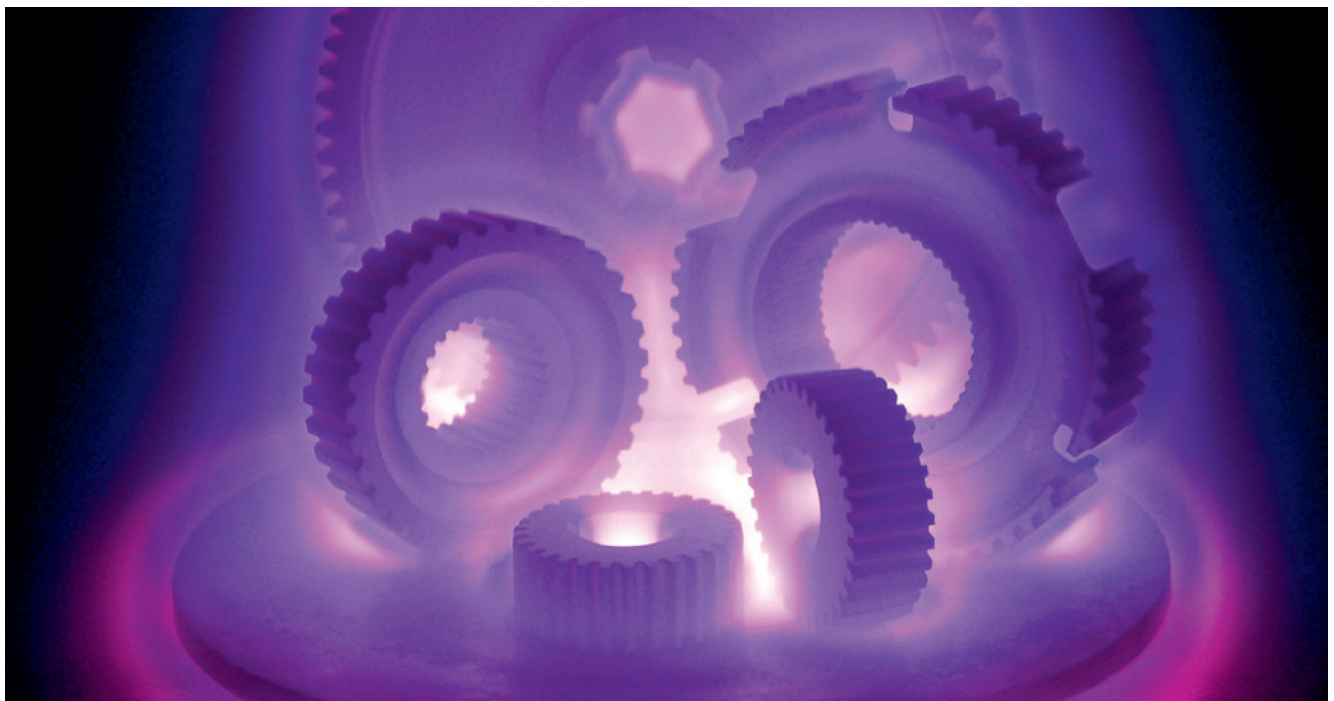
PULSPLASMA®

THE THERMO-CHEMICAL TECHNOLOGY

Rising demands on tools and machine parts require future-oriented production technologies. With our PulsPlasma® technology we provide efficient and reliable protection against wear and corrosion.

PulsPlasma® Nitriding, a plasma-assisted vacuum process that enriches component surfaces with nitrogen and/or carbon, represents a forward-thinking approach to surface treatment. This innovative process meets the industry's growing demand for reliable and efficient solutions:

- **Maximum flexibility with treatment temperatures from 350 to 600 °C**
All types of steel, titanium and other high ferrous alloys as well as special nickel and cobalt base alloys
- **Only one process run – starting with PulsPlasma® Nitriding directly followed by post oxidation surface treatment**
- **Easy partial nitriding with mechanical masking**
- **Corrosion resistance of stainless steel preserved through special processes**
- **Higher efficiency at lower cost and suitable for complex geometries**
- **Precise control of nitriding compound layer**



THE TECHNOLOGY

MASTERING PROCESS ENGINEERING FOR EXCEPTIONAL RESULTS

Building outstanding plants requires mastery in process engineering. Only through this expertise can the full potential of plant technology be realized, unlocking a wide range of applications for PlaTeG systems.



Low-Temperature Treatment (350 °C to 450 °C)

PulsPlasma® Nitriding enables the treatment of components with diverse geometries at low temperatures. This ensures consistently minimal dimensional and shape changes. Additionally, stainless steels with chromium content > 13 % can be nitrided without compromising corrosion resistance or causing embrittlement.



Precise Process Control

Accurate control of the process gas composition, combined with moderate nitriding temperatures, allows for plasma nitriding without forming a compound layer. This makes PulsPlasma® Nitriding an ideal first step in duplex treatments, providing robust support and adhesion for subsequent PVD or CVD hard coatings.



Post-Oxidation Capabilities

PlaTeG systems are designed for seamless integration of post-oxidation treatments. By using gaseous oxidants such as air, nitrous oxide, or oxygen, a uniform Fe₃O₄ layer can be formed. This enhances corrosion resistance and reduces the surface's friction coefficient.



Expanded Process Spectrum

The inclusion of additional oxygen process gases broadens the equipment's capabilities. Applications such as plasma cleaning and oxynitriding become feasible, further extending the versatility of PlaTeG systems.

OUR SERVICES

PPN₄U TAILORED TO YOUR NEEDS

PPN₄U offers simple, safe, and reliable support for plasma nitriding: from complete systems and special components to trial treatments, nitriding services for special parts, recipe creation for PlaTeG customers, global equipment service, and expert guidance on introducing plasma nitriding and surface treatments for wear and corrosion protection.

- Planning and delivery of complete plasma nitriding systems as well as special components for PulsPlasma® Nitriding
- R&D test treatments before your purchase decision
- PulsPlasma® Nitriding as a service for special and single parts
- Consulting and assistance for the introduction in your company

OUR FURNACES

MATCHED TO YOUR APPLICATION

PlaTeG-PulsPlasma® Nitriding systems offer the possibility to react flexibly to customer requirements!



Compact and Modular Design

For quick installation, ensuring economic efficiency.



Versatile Treatment Options in one plant:

PPSA™ (PulsPlasma® Surface Activation)
PPN™ (PulsPlasma® Nitriding),
PPNC™ (PulsPlasma® Nitrocarburizing),
PPC™ (PulsPlasma® Carburizing),
PPO™ (PulsPlasma® Oxidizing)



Advanced Automation

Fully automated operation allows to run processes unattended over night and on weekends.



Precise process controls

Precise gas control and moderate temperatures allow plasma nitriding with or without a compound layer.



Treatment recipe service

Our Application Engineers offer a treatment-recipe service to ensure an excellent treatment result on your system.



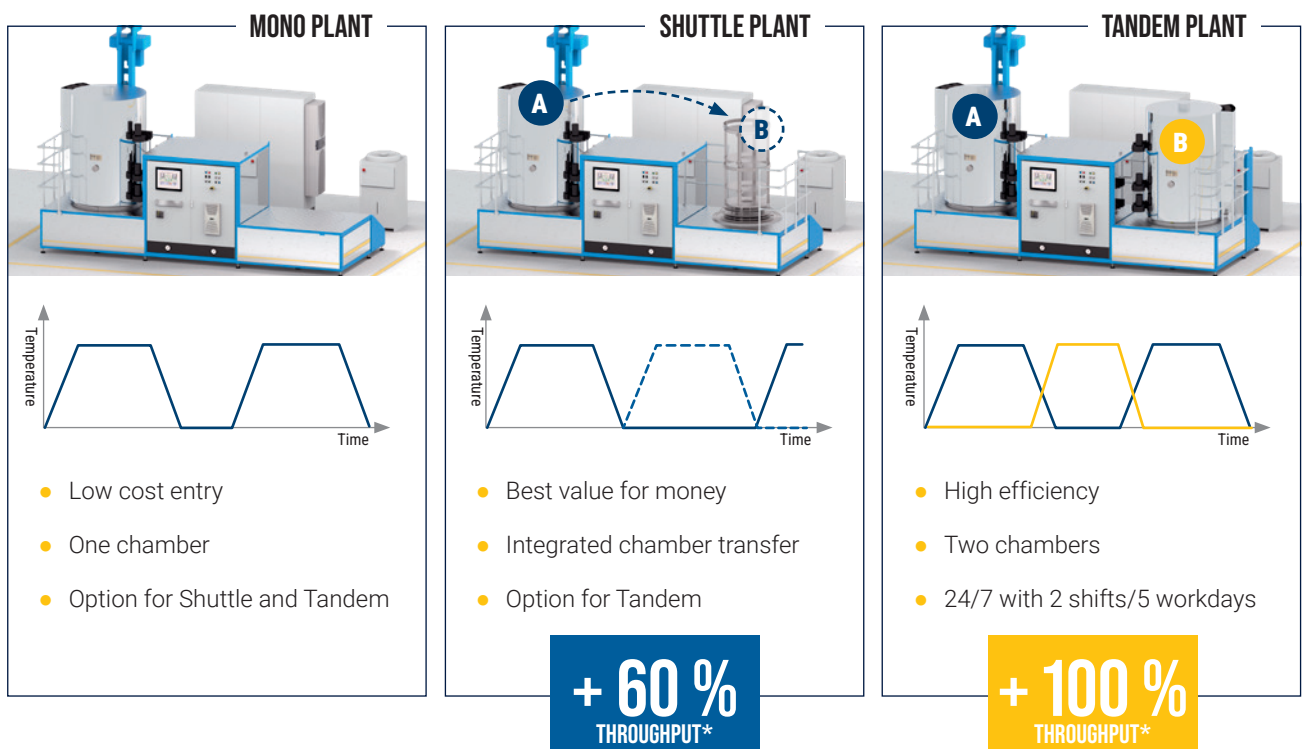
Integration and Connection

They can be integrated into existing process control systems as well as into the Internet via secure VPN connection. Remote maintenance for plant servicing, troubleshooting and advice for customers in the event of treatment problems are a matter of course for us.



Made in Germany

Engineered and manufactured in Germany, the systems are fully tested before delivery and commissioned on site to ensure process safety, reliability, and trouble-free operation. Standardized bell-type systems ensure cost effective and rapid delivery.



* Based on 2 shifts/5 workdays per week, total cycle time 17 h including loading and unloading.

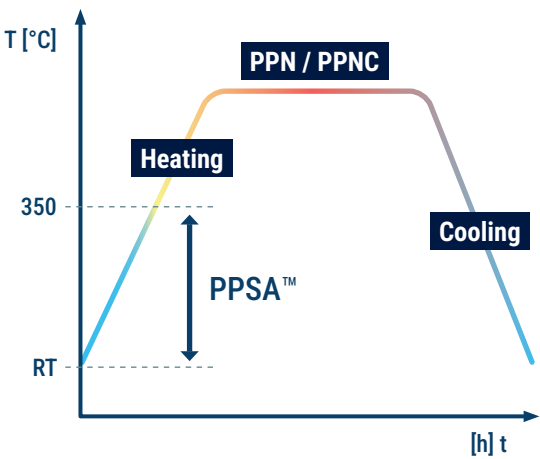


PULSPLASMA® GENERATORS

STATE OF THE ART

PlaTeG – PulsPlasma® generators are available in various power levels, and can easily be adapted to customer requirements and plant size. Their compact design enables the integration into the plant’s air-conditioned control cabinet, ensuring a long service life and low-maintenance, reliable operation. Short switch-on times in the μ s-range and the nearly ideal rectangular pulse shape of the generated pulse voltage enable a stable glow discharge plasma even at room temperature.

This allows PlaTeG’s typical PPSA™ technology to be used in the temperature range between room temperature (RT) and 350 °C. It ensures perfect surface conditioning prior to nitrogen diffusion, optimised treatment times and uniform nitriding results.



This enables the application of PlaTeG’s typical PPSA™ technology in the temperature range between room temperature (RT) and 350 °C.

SPECIFICATIONS

AVAILABLE SYSTEMS

Standard systems for a wide range of applications. Other chamber sizes and PulsPlasma® (PP) generators on request.

PLATEG.NITRIDE	200	280	600	700	1350	2250	4400
Usable Diameter [mm]	600	600	800	800	1000	1200	1600
Usable Height [mm]	700	1000	1200	1400	1700	2000	2200
Pulse Current [Amps]	60	60	120	120	200	300	500
Temperature Range [°C]	350–600						
Time to 10 Pa [min]	< 10						
Gas Types	N ₂ , H ₂ , CH ₄ and others						

Individualization on request.



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