

PlaTeG - PulsPlasma® Nitriding

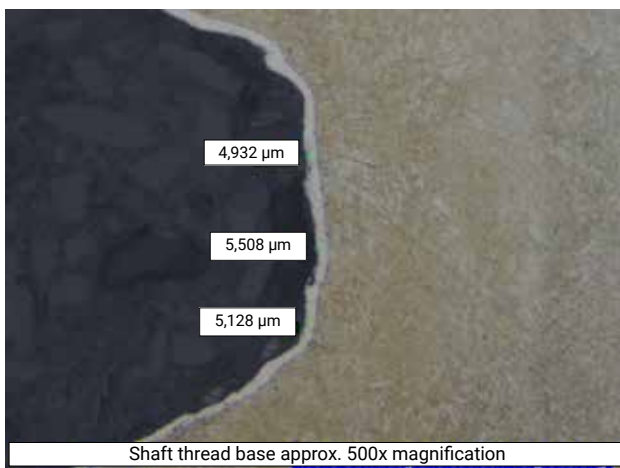
environmentally friendly & cost efficient

YOUR satisfaction is our motivation

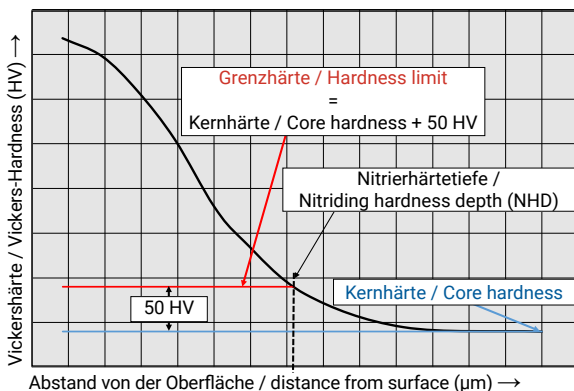


PlaTeG - The ImPULSE Generators

Based on more than 30 years of experience in the construction of vacuum systems, PVA Industrial Vacuum Systems GmbH manufactures state-of-the-art PlaTeG-**PulsPlasma**[®] Nitriding systems for the surface treatment of various metallic components and diverse geometries. Our systems aim to improve properties such as hardness, wear and corrosion resistance, heat resistance and fatigue strength.



Härteverlaufskurve / Hardness profile



PulsPlasma[®]

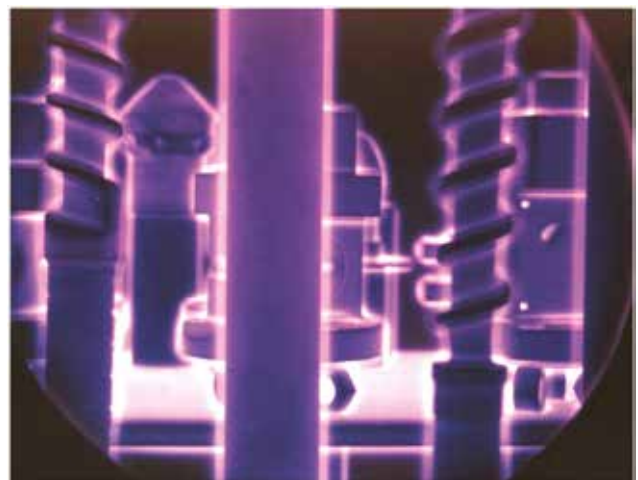
THE thermo-chemical technology for wear and corrosion protection.

Rising demands on tools and machine parts require new future-oriented technologies.

PulsPlasma[®] Nitriding, a plasma-assisted vacuum process for enriching the component surface with nitrogen and/or carbon, is a future-oriented surface treatment and ideally meets the industry's demands for reliable, efficient and environmentally friendly treatment processes.

Compared to traditional nitriding processes such as salt bath nitrocarburizing or gas nitriding, **PulsPlasma**[®] Nitriding offers following advantages:

- Low process gas and energy consumption
- Environmentally friendly process gases, no ammonia required
- Wide range of treatment temperatures 350 - 600 °C
- Easy partial nitriding by using mechanical masking
- Nitriding of stainless steel, preservation of corrosion resistance
- Controllable nitriding layer formation
- Nitriding of aluminum and titanium
- Post oxidation surface treatment possible on selected steels



Our furnaces

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

- **Flexible plant concepts**
PlaTeG plants are available as pit-type, chamber (horizontal) or bell-type furnace plants. Standard bell-type systems can be supplied as mono (1 chamber), shuttle (1 chamber, 2 bottoms) or tandem (2 chambers) systems.
- Standardized plant sizes for PlaTeG bell-type systems
For cost-efficient and fast delivery
- Special plants according to customer specifications
- Can be integrated into series production
- One plant - many treatment options
PPN™ - PulsPlasma®Nitriding
PPNC™ - PulsPlasma®Nitrocarburizing
PPC™ - PulsPlasma®Carburizing
PPO™ - PulsPlasma®Oxidizing

PlaTeG plants are compact and modular in design and enable fast installation with high economic efficiency. The plant and the processes are monitored by modern process controllers and enable fully automatic, low-personnel process control.

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

The systems are engineered and manufactured in our factory in Germany. They are also 100% tested under rigorous practical conditions before delivery to the customer and commissioned on site. Process safety, reliability and freedom from malfunctions are thus guaranteed.



Applications & Markets

Anyone who builds outstanding plants must also be a master in process engineering. Only in this way can optimum performance be drawn from the plant technology, which opens up a wide range of applications for PlaTeG plants.

PulsPlasma[®] Nitriding of components with a wide range of geometries at low treatment temperatures (< 450 °C) enables, on the one hand, treatments with consistently low dimensional and shape changes and, on the other hand, stainless steels with chromium contents >13% can be nitrided without loss of corrosion resistance and embrittlement.

Precise control of the process gas composition in conjunction with moderate nitriding temperatures allows components to be plasma nitrided without the formation of a compound layer. Thus, **PulsPlasma**[®] nitriding is very well suited as a first treatment step in duplex treatments and ensures sufficient support and adhesion of a PVD or CVD hard coating.

PlaTeG - **PulsPlasma**[®] Nitriding systems are equipped for process combination with post-oxidation treatment. Gaseous oxidants such as air, nitrous oxide and oxygen enable the formation of a uniform Fe_3O_4 layer. This can improve the corrosion resistance of the post-oxidized components and reduce the friction coefficient of the surface. It is possible to use the oxidant as an additional process gas, thus extending the process spectrum of the equipment (e.g. plasma cleaning, oxynitriding).



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:

- Contract heat treatment shops
- Mechanical and plant engineering
- Tool and mold manufacturing
- Gear manufacturing
- Automotive industry
- Aerospace industry
- Offshore industry
- Plastics industry
- Power plant industry

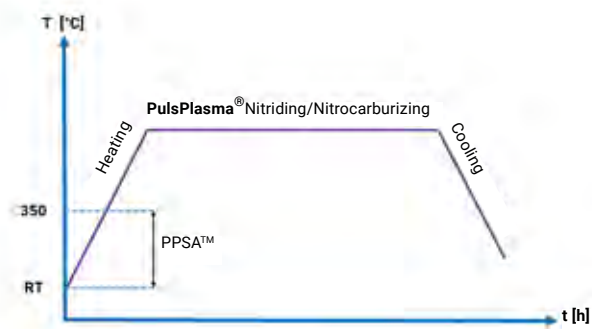


PulsPlasma® Generators - The State of the Art

The heart of our best-in-class plants

PlaTeG-**PulsPlasma**® Generators are available in different power levels and can be ideally adapted to customer requirements and plant size. The compact design allows integration into the air-conditioned control cabinet of the plant. This guarantees a long service life and low-maintenance, trouble-free operation. Fast switch-on times in the μs range and the almost ideally rectangular pulse shape of the generated pulse voltage enable a stable glow discharge plasma even at component temperature.

This enables the application of PlaTeG's typical **PPSA™ technology** in the temperature range between room temperature (RT) and 350 °C. It stands for perfect surface conditioning before the start of nitrogen diffusion and for optimized treatment times and uniform nitriding results.



Our services

PPN⁴U – simple, safe, environmentally friendly, reliable

Our range of services includes

- The planning and delivery of complete plasma nitriding systems as well as special components for PulsPlasma® nitriding of steel and other metals.
- Courtesy R&D test treatments before your purchase decision
- **PulsPlasma®** Nitriding as a service for special and single parts (on request)
- Free treatment recipe service for PlaTeG customers
- Complete equipment service for all global PlaTeG customers
- Consulting and assistance for the introduction of plasma nitriding in your company as well as in general in the field of surface treatments for wear and corrosion protection



Contact us!

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PlaTeG – PulsPlasmaNitriding® Systems

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