



xPro4R

Vacuum Hard Coating System With HiPIMS V⁺ and Rotatable Magnetron Sputtering Technology

The **xPro4R** is the most advanced industrial medium size hard coating system, based on the N4E* positive pulse HiPIMS** -technology in combination with rotatable magnetron sputtering sources.

It is specifically designed for the deposition of high performance super-smooth, high density, hard coatings, such as AlTi-, AlCr-based, Si-, B-doped metal-nitrides and -carbo-nitrides. Such coatings are sputtered in HiPIMS V⁺ and dc-pulsed magnetron sputtering mode onto a variety of cutting tools, dies and moulds, components and consumer products for high wear resistance and advantageous tribological purposes. Such coatings can be deposited as nanostructured single or multi-layers.



The xPro4R is characterized by:

- Robust system designed for the rigorous production environment using sophisticated vacuum coating technologies.
 - Rugged construction marked by an extremely advanced highly refined design.
 - Extreme reliability based on intelligent straightforward design and construction.
 - The broadest spectrum of coatings and coating technology available in a single system at the lowest possible cost.
 - Fully automatic, computer controlled, closed loop process control providing process repeatability, reliability and a user-friendly environment.
 - The coating industry's broadest capabilities in the smallest footprint
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Technical Highlights of the xPro4R:

HiPIMS V⁺ technology***

- HiPIMS V⁺ in combination with DC-pulsed magnetron sputtering by N4E*
- Increased deposition rates and film ion incorporation compared to standard HiPIMS
- Tailoring of ion energy distribution
- Strong unbalanced magnetron configuration, allowing high film ion assistance
- Rotatable magnetron sputtering sources with high target utilisation and significantly reduced arcing
- No race track compared to planar magnetrons
- Feedback controlled reactive process

Improved part handling and fixturing

- Safest most manoeuvrable transport carts
- Easy to load and use carts with high load capabilities

Short process time

- Efficient heating capabilities
- Efficient cleaning and etching cycle
- Short cycle times < 4,5 h

Improved software design

- Extreme ease of use
- Highly reproducible runs
- High level of flexibility for custom tailored coating solutions
- Remote control and diagnostics

Improved thermal management

- Intensive water cooling
- Double walled construction

Most reliable components

- Brand name components
- Clever integration

Improved coating properties

Advanced interface formation
Extremely clean process environment

System Data

Size of vacuum chamber	940 x 1.150 x 1.165 mm (L x W x H)
Coating volume	Ø 570 x h 800 mm (Ø x H)
No. of rotary platform (substrate carrier)	1 pc (substrate carrier)
Size of rotary platform (substrate carrier)	480 x 430 x 1015 mm (L x W x H)
Pumping	2 pcs double stage rotary vane pump 1 pc roots pump 2 pcs turbo-molecular pump
Sources	4 pcs rotatable magnetron sputtering sources
Power supplies	2 pcs dc-pulsed power supplies @ 20 kW 2 pcs HiPIMS power supplies @ 20 kW 1 pc 20 kW HiPIMS bias power supply
Heater	2 pcs, rated @ 12 kW each
Overall size	4.865 x 1.855 x 2.435 mm (L x B x H)
Power	150 kW, 400 V, 3 ph + N, 50/60 Hz

System capacity

Plasma volume	570 x 800 mm (Ø x H)
End mills Ø 4 x 50 mm	2,520 pcs
End mills Ø 12 x 75 mm	860 pcs
Inserts ½" x ½" x 4 mm	5,280 pcs
Hobs Ø 80 x 80 mm	160 pcs
Hobs Ø 100 x 100 mm	84 pcs

* N4E Nano4Energy, Madrid, Spain

** HiPIMS High Power Impulse Magnetron Sputtering

*** V⁺ HiPIMS with Positive Reverse Pulsing

PVT

Plasma und Vakuum Technik GmbH
Rudolf-Diesel-Str. 7
D-64625 Bensheim
www.PVTvacuum.de