

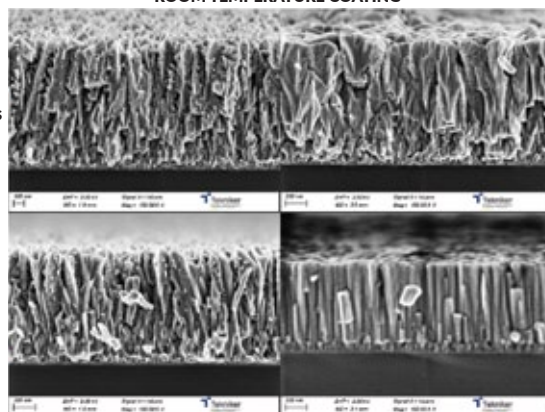
# HIP3+ ENHANCED

## HIPIMS-QUALITY DC RATE HARD COATINGS

### METAL ION IRRADIATION

#### ROOM TEMPERATURE COATING

DC TiN 3kW  
Nb 1kW  
Unipolar HiPIMS



DC TiN 3kW  
Nb 1kW  
Bipolar HiPIMS  
V+ = 350V

DC TiN 3kW  
Nb 0.5kW  
Bipolar HiPIMS  
V+ = 350V

DC TiN 3kW  
Nb 2kW  
Bipolar HiPIMS  
V+ = 350V

Introducing HIP3+ Enhanced, a novel solution for pre-etch and coating densification, delivering HiPIMS-quality coatings at lower cost and with significantly increased deposition rates.

#### TECHNOLOGY KEY ADVANTAGES

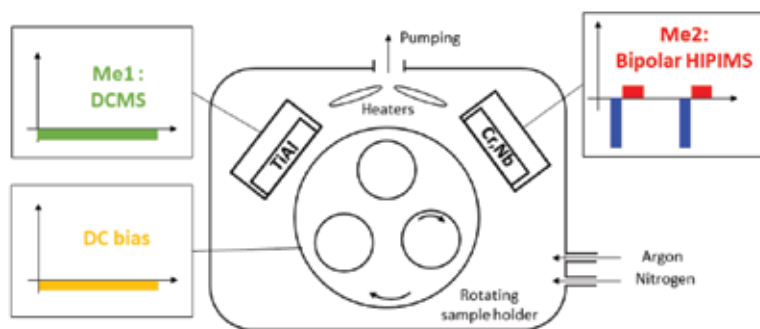
- Enhanced layer density
- Deposition rates of up to seven times greater than traditional HiPIMS method
- Reduced substrate heat requirement
- Can be added to any sputter PVD plant with inclusion of HIP3+ source and power supply

# HIP3+ ENHANCED

## METAL ION IRRADIATION

HIP3+ Enhanced is a new concept of selective metal ion irradiation that is achieved by combining bipolar HiPIMS with conventional DCMS operation and simple DC biasing. With the addition of a positive pulse to a conventional HiPIMS discharge, there is acceleration of the metal ions created during the negative HiPIMS phase.

The technology is a novel PVD deposition solution and delivers significant benefits for processes related to the hard coating industrial sector, with low heat creating the possibility for many more materials to be used in hard and decorative coating processes.



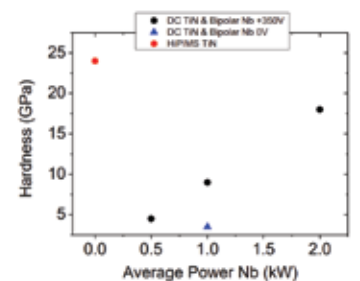
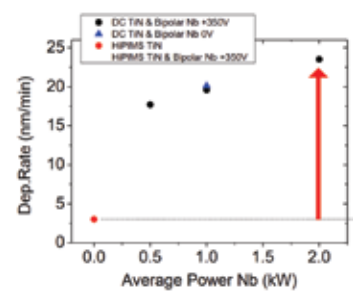
Room temperature TiN by HIP<sup>3+</sup> enhancement

## ADVANTAGES

- Enhances layer density at room temperature
- Improved hardness (Cr bombardment improved from 7 to 22 GPa)
- Improves pre-etch and adhesion
- HiPIMS quality with high rate and low cost
- Deposition rates of up to seven times greater than traditional HiPIMS method
- Optimum mechanical properties and reduced accumulated stress
- Reduction in film roughness
- Reduction of the influence of the target-to-substrate distance
- Allows use in different industrial batch-type coaters or in the deposition of large substrates with complex shapes, where a wide range of target-to-substrate distances are typically found
- Can be extended to a wide range of magnetron sputtered coatings such as refractory metals, oxides, carbides or borides
- Simple add-on to existing functional coating machines

## TYPICAL USES

- Hard decorative coatings
- Wear protective coatings for cutting tools, moulds and dies
- Decorative coating on metal and plastic



## FURTHER INFORMATION

Contact: [sales@gencoa.com](mailto:sales@gencoa.com) or visit  
[www.gencoa.com/hip3](http://www.gencoa.com/hip3)

