

## Innovation in surface technology

Nano4Energy is an advanced technology R&D company in the area of **thin film surface engineering**.



We offer partnership in the whole **R&D** process for development of new plasma technology for your specific needs in order to maximize **quality** and cost efficiency.

## Specialty Coatings

High performing DLC, taC Metal doped DLC	All-in-vacuum deposited ultra barriers for OLED
Nanostructured antibacterial coatings for implants	All-in-vacuum CIGS deposition
Reactive HIPIMS V+ deposition of hard coatings	Molybdenum disulfide as solid lubricant in space
Anatase TiO <sub>2</sub> for antibacterial surfaces	Nanostructured Tungsten for Nuclear fusion reactors

We want our customers to share our **excitement** of improving the **performance** and quality of their processes and products by developing advanced deposition techniques beyond the current **state of the art**.



[www.nano4energy.eu](http://www.nano4energy.eu)

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nano4ENERGY

# Nanotechnology for the industry — from idea to product

## Your R&D Partner for plasma technology development

Nano4Energy's devotion to development of plasma technology has led to significant improvements of coating properties as well as productivity in every day manufacturing. Due to the development of power supplies we have the possibility to tailor the whole process to optimize every parameter. The knowledge has been implemented in several industrial systems that are in the market today.

The HiPIMS HiPlus function is a great example that have led to improvements in both properties and deposition rates, boosting the HiPIMS technology in industrial applications.



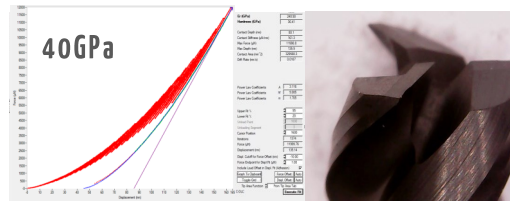
## Implementation of state of the art Coating processes in industrial coating systems



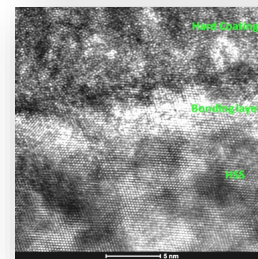
## Diamond Like Carbon

Diamond-like carbon (DLC) is a family of coatings that have been recognized as one of the most valuable engineering materials for tribological applications. Nano4Energy has developed a novel process for sputtering deposition of different highly-adherent DLC coatings with hardness up to 40GPa on metallic substrates and as high as 30GPa on insulating substrates.

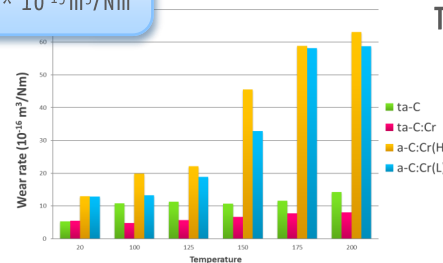
### Sputtered ta-C by HiPIMS technology



The adhesion process involves pre-treatment by HiPIMS with the HiPlus voltage reversal, adhesion layer of WC and finally a customized DLC layer, all in one process.



**ta-C:Cr**  
wear rate at 200°C  
<math>0.5 \times 10^{-15} \text{ m}^3/\text{Nm}</math>



Temperature  
resistant  
ta-C:Cr

All processes offers very high quality DLC in combination with high throughput.



HiPIMS your system

The industrial HiPIMS choice!



- FLEXIBLE
- RELIABLE
- MODULAR
- MULTI-FUNCTIONAL
- ROBUST

- HiPIMS-PS
- DC-PS (for magnetron sputtering, PECVD, Etch...)
- HiPIMS Synchronized Bias / DC-Bias
- HiPIMS AC Dual magnetron capability
- HiPlus Voltage reversal technology

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