



Re: Industrial plasma surface coating, synthesis of nanomaterials, and surface modification

Dear Madame/Sir,

My company, Nano-Product Engineering, LLC (NPE) has developed Large Area Filtered Arc Deposition (LAFAD™) and Filtered Arc Assisted Magnetron Sputtering (FAAMS™) processes to deliver advanced industrial plasma surface engineering technologies with a breadth of applications including but not limited to cutting and forming tools and machine parts, biomedical components, energy-related applications, semiconductors, and optics.

The plasma surface engineering processes are based on cathodic arc evaporation and magnetron sputtering. Coatings created by our integration of these technologies enables thin film properties with unique functional characteristics, while enabling the synthesis of nanomaterials, and in-situ surface modification. The major technological advantage of these plasma enhanced physical and chemical vapor deposition technologies is the ability to:

- produce intense fluxes of metal vapor plasma with high kinetic energy of metal ions
- mix a large flux of metal ions with neutral metal atoms in a controllable manner
  - allowing 0%-100% scalable metal ions concentration in the mixed ion/neutral atomic flows while keeping up to 30% ionization of the reactive gaseous environment
- deposit atom-by-atom smooth, highly conformal over 3D complex shape substrates, nanostructured coatings of single and compound metals, ceramics (nitrides, carbides borides, oxides), and hydrogen-free ta-C superhard DLC coatings (H>70GPa)
- modify surfaces by plasma immersion ionitriding, low energy ion implantation, and reactive remote plasma etching
- synthesize core-shell micro-and nanopowders with high value physical and chemical properties
  - including super-hard diamond powders
- providing high uniformity of substrate treatment over the large, industrial-size processing chambers, short processing time and competitive price range.

We have developed a line of products which are in operation in a number of locations across North America. You can find more detailed explanations and descriptions of these technologies by visiting our website: [www.nanoproductengineering.com](http://www.nanoproductengineering.com).

Please let me know when would be a convenient time to give you a call or please contact me.

Yours sincerely,

Vladimir

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