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**ON THE INJECTED GAS/ELECTRIC POWER RELATION FOR DEPOSITION EFFICIENCY CONTROL DURING THE GIMS DEPOSITION**Krzysztof Zdunek<sup>1</sup>, Katarzyna Nowakowska-Langier<sup>2</sup>, Rafal Chodun<sup>1</sup>, Jerzy Dora<sup>3</sup><sup>1</sup>Warsaw University of Technology, Warsaw, Poland <sup>2</sup>National Centre for Nuclear Research, Otwock, Poland <sup>3</sup>Dora Power Systems, Wilczyce, Poland

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During the last AEPSE'2011 conference we presented our concept as well as the first results of the use of working gas injection to control the generation of pulsed plasma. The problem was discussed on the basis of two methods: IPD and MS. The first results indicated the desirability of a deeper interest in such a way of plasma process control. The idea of using the working gas injection instead of stationary gas flow mode assumes in the first approximation that the lack of cold gas in the chamber space prior to gas injection could next avoid the kinetic energy dissipation on collision between the plasma particles and the cold gas. Previously presented studies (AEPSE) have shown the initial experimental results proving the positives of proposed modification of the well known methods of plasma surface deposition (in the case of IPD - possibility of exceptionally effective producing of antiabrasive layers on unheated substrates and from the other hand - the positive change in the morphology of layers as well as a different way of target erosion during the layer deposition by MS). Lately carried out experiments have showed that during the GIMS deposition of AlN coatings (GIMS - Gas Injection Magnetron Sputtering) higher amounts of Al-Al bonds have occurred in comparison with the case of stationary gas flow mode. It seems to us that the reason of that metallic "tail" could be both the diminishing of the portion of reactive gas and/or self sputtering effect of the aluminum target arising during the last phase of Ar+N<sub>2</sub> mixture injection. The proposed contribution concerns the very last our studies on the possibilities of control the gas/electric power relation during the GIMS process and its importance for the coating material.

**Keywords**

PSE

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MAGNETRON SPUTTERING

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