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Dmitrii V. Sidelev<sup>a,\*</sup>, Galina A. Bleykher<sup>a</sup>, Vladislav A. Grudinin<sup>a</sup>, Valery P. Krivobokov<sup>a</sup>,

Massimiliano Bestetti<sup>a,b</sup>, Maxim S. Syrtanov<sup>a</sup>, Evgenii V. Erofeev<sup>c</sup>

<sup>a</sup> Institute of Physics and Technology, Tomsk Polytechnic University, Lenin Avenue 2a, Tomsk,  
634050, Russia

<sup>b</sup> Politecnico di Milano, Department of Chemistry, Materials and Chemical Engineering “Giulio  
Natta”, Milano, Italy

<sup>c</sup> Tomsk State University of Control Systems and Radioelectronics, 47 Vershinina str., Tomsk,  
634034, Russian Federation

\*Corresponding author: sidelevdv@tpu.ru, +7-3822-70-17-77-1-2595#

**Abstract**

This work is an investigation on the operation parameters for Ni films deposition by magnetron sputtering from target working at temperatures higher than the Curie temperature due to magnetic phase transition of the sputtered target, which is partial heat-insulated from the water-cooled magnetron body. The ferro- to paramagnetic transition of the target results in decrease of discharge voltage and rise of discharge current. Thereby, discharge power increases under voltage control mode or hot Ni target sputtering can occur at lower pressures under power control mode. Heating of the Ni target and its ferro- to paramagnetic transition lead to stabilization of the discharge parameters. The changes of the discharge current and power decreased from 10.5% to 2.5% during a single sputtering process under voltage control mode. Moreover, a slight increase of the deposition rates of 20...25% was determined, when hot target sputtering was performed. The XRD assessment showed that Ni films deposited by hot target sputtering have a textured crystal structure with larger grain sizes and lower residual stresses in comparison with cooled Ni target sputtering. When passing from cooled to hot target sputtering, the type of film growth changes from *zone I* to *zone T*, and surface roughness of Ni films decreased.

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