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# **Change in Microstructure and Magnetic Properties of Transition Metal Nitride Thin Films by Substrate Temperature**

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The magnetic and mechanical properties of transition metal nitrides can be altered in many ways by their composition and microstructure, thus giving them excellent usability for spintronics and corrosion resistant coatings. The production of binary and ternary nitride thin films by reactive sputter deposition provides a wide variety of unique material combinations. This study shows the considerable influence of the substrate temperature on microstructure and magnetic properties for different nitride compounds (Fe-N, Ni-N, Fe-Ni-N, and Fe-Al-N). The substrate temperature is found to be a significant parameter which allows adjusting the phase formation and magnetic properties from soft ferromagnetic to superparamagnetic. Furthermore, the extent and incidence of texturing as well as the transition from poly- to monocrystalline thin films can be controlled.