

# Titanium-based thin films for protective coatings prepared by TVA (Thermionic Vacuum Arc) technology

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**Abstract.** The aim of the present work is to achieve the controlled synthesis of Ti and Mg thin films, with compact structure and extremely smooth surface, by using the Thermionic Vacuum Arc (TVA) technology, from elemental powder of titanium and magnesium. The thin film exhibits an amorphous structure, with polycrystalline grain mainly being Mg hexagonal phase and small amount of hexagonal Ti. Grain mean size was estimated to be ~120nm by statistical analysis of measured Feret diameter of projected area of grain. The phases were tested by mean of Cohen method applied to electron diffraction results. No oxide (MgO, TiO<sub>2</sub>) lines could be identified from electron diffraction. Debye-Scherrer dimension, estimated from electron diffraction profile is ~4 nm. The analysis of amorphous part from diffraction profile show different coordination number for Mg and Ti atoms.