

## STRESS GRADIENTS IN $Ti_xCr_{1-x}N$ COATINGS

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Thin hard  $Ti_xCr_{1-x}N$  coatings fabricated by the cathodic arc vapour deposition are now widely used as corrosion and wear resistance protective coatings. Ternary transition metal nitride coatings provide a wide range of structures that enable control of mechanical and electronic properties. Moreover, ternary compound coatings often exhibit fine-grained and distorted structures resulting in high hardness. The coatings have been produced by condensation from a plasma phase in a vacuum with ion bombardment of sample surfaces while combining Ti and Cr plasma flows of variable density in a residual nitrogen atmosphere.

The residual stress gradient within the coating has been studied using wide angle X-ray diffraction measurements and modified  $\sin^2\psi$  method. Multiple Bragg reflections are analyzed to evaluate stress tensor components. The variable incidence angle of X-rays allowed to control a penetration depth and to perform a depth-selective scanning of the crystalline structure of the coatings. Supplementary, specular X-ray reflectivity technique has been utilized to probe a concentration profile of layers.