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Title:

Anodisation of sputter deposited aluminium-titanium coatings: Effect of microstructure on optical characteristics

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Abstract:

Magnetron sputtered coatings of aluminium containing up to 18 wt. % titanium were deposited on aluminium substrates to study the effect of microstructure on the optical appearance of the anodised layer. The microstructure and morphology was studied using transmission electron microscopy (TEM), X-ray diffraction (XRD), and glow discharge optical emission spectroscopy (GDOES), while the optical appearance was investigated using photospectrometry. The microstructure of the coatings was varied by heat treatment, resulting in the precipitation of Al₃Ti phases. The reflectance of the anodised surfaces decreased with titanium content in the as-deposited, and heat-treated states, and after anodisation of the as-deposited coatings. Specimens turned grey or black when anodising after heat treatment. Partially anodised Al₃Ti phases were found in the anodised layer, and the interface between substrate and anodised layer was rough, causing light trapping. Progressive

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