# CATHODIC ARC EVAPORATION OF MCrAlY COATINGS

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PVD cathodic arc evaporation is investigated as an attractive method to deposit some of the layers of thermal barrier coating systems. In this work, relatively thick (>50µm), well adherent and smooth MCrAlY coatings were deposited on various superalloy substrates. The evaporation targets were produced by spark plasma sintering from formulated MCrAlY powders, allowing us a design purposed for specific application needs. Coherent growth of the MCrAlY coatings was observed in the interface region between the MCrAlY coating and superalloy substrates already at deposition temperatures as low as 550°C. Annealing at 1000°C and above in ambient atmosphere resulted in the formation of a dense scaling of α-alumina. Such coatings represent an interesting alternative to MCrAlY bond coats deposited by thermal spray. Another key advantage of PVD lies in the possibilities to vary coating properties and combine different materials during deposition. Thereby, property gradients and multilayers can be generated in a single process. This was used in this work to generate a protective oxide in-situ during the coating process. A dense AlCrO layer was deposited on top of a relatively thin (~10µm) PVD MCrAlY bond coat. Annealing the coated superalloy substrates in ambient atmosphere at 1093°C evidenced a very good protection against oxygen diffusion.