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**Oxidation resistance of doped AlTiTaN Coatings: Effect of nature and quantity of the doping element**

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AlTiSiN and more recently AlTiTaN coatings were shown to present excellent oxidation and wear resistance at high temperature [1,2]. However, some machining applications still need more resistant coatings at high temperature to get sufficient enough tool lifetimes. Doping of the AlTiSiN and AlTiTaN coatings by reactive elements such as Ce, La, Y or Hf should allow an increase of the coating oxidation resistance by favouring the formation of a protective alumina layer at high temperature [3]. The doping element may have a negative impact on the thin film growth and its properties if added in too high quantity but it can have no effect if added in too low quantity. The understanding of the doping element effect on the growth and properties of these coatings is necessary in order to choose the most appropriate nature and quantity of dopants in function of the targeted application.

In this paper, the deposition and the high temperature oxidation behavior of Y and Ce doped AlTiTaN films on WC-Co and Si substrates is investigated. Reactive magnetron sputtering with four different targets is used in order to tune the coating composition. We discuss the influence of the nature and quantity of the doping element on the coating high temperature oxidation and wear resistance.

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**Keywords**

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magnetron sputtering

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