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PII: S0040-6090(15)00114-5
DOI: doi: 10.1016/j.tsf.2015.01.069
Reference: TSF 34076

To appear in: *Thin Solid Films*

Received date: 17 November 2014
Revised date: 16 December 2014
Accepted date: 6 January 2015

Please cite this article as: Marisa Rebelo de Figueiredo, Manuel D. Abad, Adrian J. Harris, Christoph Czettl, Christian Mitterer, Peter Hosemann, Nanoindentation of CVD Al_2O_3 hard coatings at elevated temperatures, *Thin Solid Films* (2015), doi: 10.1016/j.tsf.2015.01.069

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Abstract:

Nanoindentation measurements at elevated temperatures were performed on α-Al_2O_3 and κ-Al_2O_3 hard coatings at temperatures up to 600 and 700°C, respectively. A reduction of the hardness and reduced modulus was observed for both coating systems although more accentuated for the κ-Al_2O_3 coating. In addition, a comprehensive overview of guidelines on how to perform nanoindentation measurements on hard coatings at elevated temperatures is provided.

Keywords: high-temperature nanoindentation; alumina; α-Al_2O_3; κ-Al_2O_3; hard coating;