

Accepted Manuscript

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PII: S0257-8972(16)30769-1
DOI: doi: [10.1016/j.surfcoat.2016.07.090](https://doi.org/10.1016/j.surfcoat.2016.07.090)
Reference: SCT 21466

To appear in: *Surface & Coatings Technology*

Received date: 31 March 2016
Revised date: 30 June 2016
Accepted date: 4 July 2016



Please cite this article as: Daniel Esqué-de los Ojos, James P. Best, Jakob Schwiedrzik, Marcus Morstein, Johann Michler, A closed-form analytical approach for the simple prediction of hard-coating failure for tooling systems, *Surface & Coatings Technology* (2016), doi: [10.1016/j.surfcoat.2016.07.090](https://doi.org/10.1016/j.surfcoat.2016.07.090)

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A closed-form analytical approach for the simple prediction of hard-coating failure for tooling systems

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Keywords: Tool steel; coating failure; mechanical properties; ceramics; analytical model

Abstract

Hard coatings are used extensively to protect tools in forming, forging and milling operations. While modern deposition of hard coatings using plasma methodologies has opened industry up to a new range of potential coating systems, challenges remain regarding coating optimization under specific conditions and environments. In the presented work a previously developed contact mechanical failure map, based on analytical solutions for a coating/substrate system under a contact load, was extended to include a thin-plate analytical solution for plastic deformation of a

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