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☐ 41. **Influence of Coating Thickness and Contact Stress on the Fatigue Failure of HVOF Coatings**

**Ahmed, R.** (Heriot-Watt University); **Hadfield, M.** **Source:** *Proceedings of the International Thermal Spray Conference*, 2001, p 1009-1015

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**Abstract:** Fatigue and delamination resistance of overlay coatings is critical to their performance in tribological applications involving Hertzian loading. This study addresses the influence of coating thickness and contact stress fields on the fatigue/delamination resistance of thermal spray (WC-12%Co) coatings, deposited by a JP-5000 system. These coatings were deposited in three different thicknesses on the surface of 440-C steel substrate cones. Fatigue tests were conducted using a modified four-ball machine under various tribological conditions of contact stress and configuration. Results are discussed in terms of Hertzian contact stress fields, coating thickness and Scanning Electron Microscope (SEM) observations to comprehend the performance and ascertain the fatigue failure modes of coated rolling elements. These results indicate that by appropriate control of coating thickness and tribological conditions, it is possible to achieve a fatigue life in excess of 70 million stress cycles without failure. Further studies in this field can thus trigger an area of new novel applications of thermal spray coatings. (17 refs.)

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