
Numerical and Analytical Analysis of Hertz Contact Pressure in ASTM G99 Wear Test

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Presentation/Paper Type: Oral / Abstract

Abstract- Contact pressure is very critical for wear test. In order to make true wear experiment, counter body, surface, wear load, surface roughness, and the hardness of materials should be selected correctly. Maximum contact pressure forms at hertz point. In this study, Hertz contact pressure and radius calculated in numerically and analytically for ASTM G99 wear test conditions. Sphere (Counter Body) accepted as isotropic WC material. In addition, position of sphere considered as vertically fixed at contact point. Substrate supposed as structural steel. All calculations including analytical and numerical had been made for fully elastic contact interface condition. The formation of strains due the contact also accepted as negligible. Numerical model created by using ANSYS software. Numerical models solved under the 3 different mesh density. Analytical and numerical solutions compared. The results showed that numerical models for this situation could fit the analytical model. In addition, mesh independencies for numerical models converged the analytical values.

Keywords- *Wear Test, Hertz Contact Pressure.*