

An Analytical Model for Shot-Peening Induced Residual Stresses

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Summary

To improve the fatigue life of metallic components, especially in aerospace industry, shot peening is widely used. There is a demand for the advancement of numerical algorithms and methodologies for the estimation of residual stresses due to shot peening. This paper describes an analytical model to simulate the shot peening process and to estimate the residual stress field in the surface layer. In this reasonable, convenient, and simple model, no empirical relation is used, and the effects of shot velocity are included. The results of validation of this model against the test data are very good.

