

Strain Compensation in Piezoresistance Stress Measurements

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Abstract

Measurements of ground-shock stress using piezoresistance foils can be significantly perturbed by strain-induced resistance changes when the measurement location is very close to the impact or explosion location. Armoring the foil elements in "flatpack" gauge packages mitigates the strains, but corrections to the raw signal are nearly always necessary. Use of a companion element to measure strain inside the package allows such a correction. This paper describes a flatpack gauge package with ytterbium, manganin, and constantan foil elements used in concert to measure stress in severe ground-shock environments; discusses the analytic procedure to correct for the strain-induced signal; and gives examples of stress measurements with large strain corrections.