

Abstract Submitted
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Measurement of strength of EN3B Mild Steel using lateral gauges. RUTH HAMMOND, PCS, Cambridge University, Cambridge, UK, RON WINTER, ERNIE HARRIS, AWE, Aldermaston, Reading, UK — Hammond and co-workers, (APS SCCM, 2003, p1125), measured the resistance change of lateral manganin gauges mounted in EN3B mild steel samples. All of the experiments were conducted at an impact velocity of 400m/s giving a shock pressure of about 7GPa. Although the main aim of the study was to determine the effect of seven different thicknesses of protective padding on the resistance-time profile, the results also provide data from which the strength of the sample material can be derived. The method used to estimate the strength of the steel is based on a picture of the mechanisms at play during gauge operation as provided by high resolution hydrocode simulations. First, existing calibration curves were used to estimate the stress at each gauge corresponding to the measured resistance change. Hydrocode simulations were then used to determine the material strength that matched the observed stress at the gauges. An elastic-perfectly plastic model was assumed for both the sample and the manganin.

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