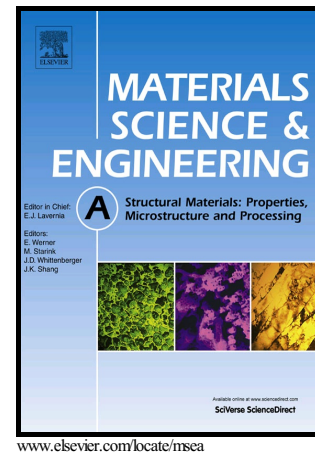


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Mechanical and microstructural properties of 2024-T351 Aluminium using a hat-shaped specimen at high strain rates

Nathan J. Edwards^{1,2}, Wei Song³, Stephen J. Cimpoeu⁴, Dong Ruan^{1,2*}, Guoxing Lu¹ and Norman Herzig⁵

¹Department of Mechanical and Product Design Engineering, Faculty of Science, Engineering and Technology, Swinburne University of Technology, John Street, Hawthorn, VIC 3122 Australia

²Defence Materials Technology Centre, 24 Wakefield St, Hawthorn VIC 3122, Australia

³Department of Materials Science and Engineering, Monash University, Wellington Rd, Clayton VIC 3800, Australia

⁴Defence Science and Technology Group, 506 Lorimer St, Fishermans Bend, VIC 3207, Australia

⁵Nordmetall GmbH, Adorfer, Hauptstrasse 16, D-09221 Neukirchen, Germany.

*Corresponding author. druan@swin.edu.au Phone: +61 3 9214 8258.

Abstract

This paper investigates adiabatic shear bands (ASBs) in 2024-T351 aluminium and their effect on the mechanical properties and microstructure of this aluminium alloy. Using hat-shaped specimens in a split Hopkinson pressure bar (SHPB) and universal testing machine, resolved shear stress-nominal plastic shear strain curves were presented at shear strain rates between 1×10^{-4} to $15.4 \times 10^3 \text{ s}^{-1}$. A revised formula for shear stress in hat specimens is proposed. Microstructural observations were completed on deformed specimens, with hardness results, scanning electron microscopy (SEM) and energy dispersive X-ray spectroscopy (EDS) presented. A critical shear strain rate range for ASB initiation in

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