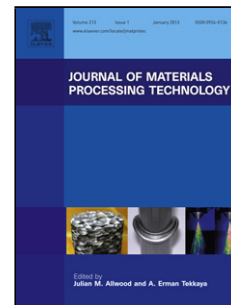


Accepted Manuscript

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PII: S0924-0136(17)30011-0
DOI: <http://dx.doi.org/doi:10.1016/j.jmatprotec.2017.01.011>
Reference: PROTEC 15086

To appear in: *Journal of Materials Processing Technology*

Received date: 4-12-2016
Revised date: 12-1-2017
Accepted date: 14-1-2017

Please cite this article as: Yuan, Lin, Shi, Wenchao, Shivpuri, Rajiv, Xu, Fuchang, Shan, Debin, Increased hot forgeability of 2024Al/Al₁₈B₄O₃₃w whisker composites at high strain rates. *Journal of Materials Processing Technology* <http://dx.doi.org/10.1016/j.jmatprotec.2017.01.011>

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Increased hot forgeability of 2024Al/Al₁₈B₄O₃₃w whisker composites at high strain rates

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Abstract

Whisker reinforced aluminum alloy composites are attractive for structural applications in automotive and aerospace applications. However, their forgeability is limited by their poor ductility at room temperature. The effects of temperatures (350 - 520°C) and strain rates (0.01 - 50s⁻¹) on the resistance to microcracking and on the closure of voids are investigated for 2024Al/Al₁₈B₄O₃₃w whisker composite as well as unreinforced AA2024 alloy. Under elevated temperature and high strain rate (>450°C, >1.0s⁻¹), there are less cracks and no axial splitting on the surface of 2024Al/Al₁₈B₄O₃₃w composite. Test results show lower flow stresses and incipient melting at higher temperatures enable better tolerance of whisker-matrix strain

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