

New Dynamic Constitutive Model for OFHC Copper Film

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Abstract : The material properties of OFHC copper film was investigated with the High-Speed Material Micro Testing Machine (HSMMTM) at the high strain rates. The rate-dependent stress-strain curves from the experiment and the Johnson-Cook curve fitting showed large discrepancies as the plastic strain increases since the constitutive model implies no rate-dependent strain hardening effect. A new constitutive model was proposed in consideration of rate-dependent strain hardening effect. The strain rate hardening term in the new constitutive model consists of the strain rate sensitivity coefficients of the yield strength and strain hardening.

Keywords : rate dependent material properties, dynamic constitutive model, OFHC copper film, strain rate

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