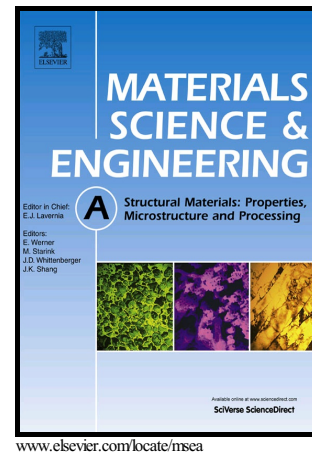


# Author's Accepted Manuscript

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**Deteriorated tensile creep resistance of a high-pressure die-cast  
Mg–4Al–4RE–0.3Mn alloy induced by substituting part RE with Ca**

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**Abstract**

Tensile creep resistance of a high-pressure die-cast Mg–4Al–4RE–0.3Mn (AE44) alloy was significantly deteriorated after substituting part RE with Ca. According to traditional power-law creep theories, the stress exponent and the activation energy were revealed as 6 and 217 kJ/mol, which indicate inconsistent mechanisms of dislocation climb and dislocation cross-slip, respectively. Then, transmission electron microscopy (TEM) observations illustrate that dislocation substructures developed during creep are variational with precipitate characters in  $\alpha$ -Mg grains, creep stress levels and creep temperatures. Therefore, both stress exponent and activation energy

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