NM P 2

Abnormalni rast zrna u AA5182 leguri: uticaj deformacije i temperature žarenja

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U ovom radu prikazani su rezultati sistematičnih ispitivanja uticaja parametara termo-mehaničke prerade (TMP) Al-Mg legure AA5182 na pojavu abnormalnog rasta zrna (AGG). AGG predstavlja razvoj mikrostrukture koju karakteriše pojava velikih zrna okruženih finijim, tj. obrazovanje bimodalne distribucije veličine zrna. Sklonost legure prema AGG ograničava temperaturu žarenja, sposobnost oblikovanja u toplom stanju i pogoršava mehanička svojstva. TMP je uključila hladno valjanje sa redukcijama u opsegu 40-85 % i rekristalizaciono žarenje 1h u temperaturnom intervalu 350-520 °C ili izotermalno žarenje na 480 °C pri različitim vremenima. Mikrostruktura je karakterizovana optičkom mikroskopijom u polarizovanom svetlu i u FEG SEM-u. Rezultati pokazuju da povećanje stepena redukcije pomera početak abnormalnog rasta zrna ka nižim temperaturama. Abnormalan rast zrna i mobilnost granica zrna pokazali su izraženu anizotropiju, ukazujući na uticaj oblika i distribucije disperzoida, kao i Zenerovo blokiranje granica zrna.

Ovaj rad je finansiralo Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije, projekat TR 34018.

Abnormal grain growth in AA5182 alloy: Influence of deformation and annealing temperature

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This study investigated the effect of parameters of thermo-mechanical processing (TMP) of Al-Mg alloy AA5182 on the occurrence of abnormal grain growth (AGG). AGG represents development of microstructure of large grains surrounded by finer, *i.e.* bimodal grain size distribution. The propensity of alloy toward AGG severely limits the annealing temperature range, capability for hot forming and deteriorates mechanical properties. TMP included cold rolling with reductions ranging 40-85 % followed by isochronal anneal (1h) in temperature range 350-520 °C or isothermal treatment at 480 °C for various times. The microstructure was characterized by optical microscopy in polarized light and in FEG SEM. The results showed that the increase in the degree of reduction lowers annealing temperature at which the onset of AGG takes place. AGG and grain boundary mobility showed strong anisotropy indicating the influence of shape and distribution of dispersoids as well as Zenner pinning.

This work was financially supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia, under contract No. TR 34018.