

Novel molding technique for ECAP process and effects on hardness of AA7075

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ORIGINALUS FORMAVIMO METODAS TAIKOMAS VIENODO SKERSMENS KAMPINIŲ KANALŲ PRESAVIMUI IR JO ĮTAKA AA7075 KIETUMUI

R e z i u m ė

Šiame straipsnyje pateikiama originali vienodo skersmens kampinių kanalų presavimo technologija antgaliu, pavadintu „Hexa die“ suprojektuotu ir pagamintu tam, kad sumažinti proceso trukmę bei išvengti problemų atsirandančių bandinį presuojant rankiniu būdu. Preso formos paviršiai buvo apdirbti taip, kad iš suformuotų cilindrinų kanalų būtų galima ištraukti ECAP bandinius. Šie kanalai 100% užtikrina cilindrinų bandinių praeinamumą. Eksperimentiniai tyrimai buvo atliekami su bandiniais pagamintais iš tų pačių medžiagų (AA7075), esant 210°C pastoviai temperatūrai ir „C“ sukimui. Tyrimo metu tradicinės ir naujos technologijos procesų trukmės rezultatai buvo palyginti su teoriniu grafiku. Nustatyta, kad originali „Hexa die“ technologija našesnė ir efektyvesnė dėl to, kad proce-

sas vyksta trumpiau, greičiau ardamos ir pakartotinai surinkamos formos ir daugelio kitų faktorių.

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NOVEL MOLDING TECHNIQUE FOR ECAP
PROCESS AND EFFECTS ON HARDNESS OF AA7075

S u m m a r y

In this study, a novel Equal channel angular pressing (ECAP) die which named "Hexa die", designed and manufactured in order to reduce process duration and eliminate manual sample rotation problems. For this reason, the surfaces of die was machined to get the cylindrical channels be able to extract out of ECAP samples. These chan-

nels provide 100% accuracy for angular routes for cylindrical samples. Experiments are carried out with the same sample materials (AA7075) at a constant temperature (210°C) and "C" rotation. In the study, process time scenarios for traditional and novel Hexa die techniques have been compared in a theoretical time table. It has been shown that Hexa die has crucial time advantages in order to eliminating the old die process steps such as cooling and reheating time, disassembly and re-assembly of the dies, manually rotation of samples and many of others. And finally ECAP'ed samples hardness have been measured.

Keywords: molding, ECAP, deformation, Hexa die, aluminum, hardness.

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