주조/부분단조기술을 이용한 알루미늄 컨트롤암 제조 기술

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Combined Casting and Partial Forging of Aluminum Alloy Control Arm

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In this work, new technology is proposed to produce an aluminum alloy control arm integrated with a ball joint. This technology consists of die casting for preform of near net-shaped control arm and partial forging for ball joint socket in order to reduce the manufacturing cost and to improve the mechanical properties of caulking area of ball joint. For this, three dimensional finite element analyses was carried out to find the optimum design of control arm preform and suitable process design so that dimensional accuracy of the control arm can be within allowable tolerance. Based on the simulation results, the partial forging experiments were carried out to make the ball joint socket using the specially designed closed die-set. Finally, the mechanical properties such as yield and tensile strength, elongation and microhardness were investigated through the tensile tests.

Keywords: Aluminum alloy control arm, Preform design, Combined casting/partial forging technology

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