World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:9, No:12, 2015

Effect of Strontium on Surface Roughness and Chip Morphology When Turning Al-Si Cast Alloy Using Carbide Tool Insert

Authors : Mohsen Marani Barzani, Ahmed A. D. Sarhan, Saeed Farahany, Ramesh Singh

Abstract : Surface roughness and chip morphology are important output in manufacturing product. In this paper, an experimental investigation was conducted to determine the effects of various cutting speeds and feed rates on surface roughness and chip morphology in turning the Al-Si cast alloy and Sr-containing. Experimental trials carried out using coated carbide inserts. Experiments accomplished under oblique dry cutting when various cutting speeds 70, 130 and 250 m/min and feed rates of 0.05, 0.1 and 0.15 mm/rev were used, whereas depth of cut kept constant at 0.05 mm. The results showed that Sr-containing Al-Si alloy have poor surface roughness in comparison to Al-Si alloy (base alloy). The surface roughness values reduce with cutting speed increment from 70 to 250 m/min. the size of chip changed with changing silicon shape in Al matrix. Also, the surface finish deteriorated with increase in feed rate from 0.5 mm/rev to 0.15 mm/rev.

Keywords : strontium, surface roughness, chip, morphology, turning
Conference Title : ICAME 2015 : International Conference on Automotive and Mechanical Engineering
Conference Location : Sydney, Australia
Conference Dates : December 10-11, 2015