International Journal of ChemTech Research
CODEN(USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.11 No.05, pp73-77,2018

Influence of Solid Lubricant Particles on Surface Roughness in Turning Hybrid Metal Matrix Composites

P.M.Gopal*, P. Paranthaman, N. Sathieshkumar

Karpagam Academy of Higher Education, Coimbatore, India.

Abstract: The current study presents an experimental examination on surface roughness in turning Al6061/10B_4C, Al6061/10B_4C/2%MoS_2,Al6061/10B_4C/4%$MoS_2$and Al6061/10B_4C/6%MoS_2 composites. The novel composite is fabricated through stir casting composite by reinforcing constant amount of boron carbide ceramic particles (10% in weight) and varying weight percentage of MoS_2solid lubricant (0, 2, 4 and 6). Turning experiments were conducted based on the Taguchi L16 orthogonal array experimental design with carbide tool. The results reveals that the increase in weight percentage of MoS_2leads to increased surface roughness values. The ANOVA results indicated that feed has highest influence on surface roughness followed by MoS_2content, depth of cut and speed. Increase in MoS_2content in the composite results in discontinuous chip formation which indicates the ease of machining.
Key words: Hybrid MMC, Solid lubricant, ANOVA, Surface roughness.

International Journal of ChemTech Research, 2018,11(05): 73-77.

DOI= http://dx.doi.org/10.20902/IJCTR.2018.110508

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