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Machinability Studies of Aluminium-based Hybrid Metal Matrix Composites – A Critical Review

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Abstract: Aluminium composites are being used in many industries like automobiles, aeronautical, signage, cabinetry, cladding and transportation. Aluminium has a lightweight, long lasting, weather resistance, fire resistance and ratio of strength- to- weight is high properties. In today's rapidly developing manufacturing industries, there are many challenges to use metal composites. Also, there is a need to do research on various input parameters, safety parameters and environmental impacts. now, today's era vehicle manufacturing companies are growing up faster. vehicle manufacturing companies are focusing on increasing speed and reducing weight of vehicles so it will be achieved by choosing appropriate metal compositions. For the machining process, a turning operation has been selected. As the material hardness increases cutting forces increase and there is a need to select proper material to cut these composites. For preparing various metal composites stir casting, sand casting, squeeze casting, in-setu method and powder metallurgy process were used. The aim of this study is to give better suggestions and understanding of which material composites should be used? What is the alternative metal by considering operating conditions for machining and performance parameters? Present study is being investigated considering cutting speed, feed rate and depth of the cut while machining and how it affects performance parameters such as high tool wear, hardness, strength, SR, castability and chips production etc. Suggested carbon fibre is an alternative and how it affects the motion of an object and how it adds value in safety by considering certain parameters.

Keywords: Reinforcement, Carbon fibre, Composites, Stir casting

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