

## ADVANCES IN ABRASIVE FLOW MACHINING: AN OVERVIEW

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### ABSTRACT

Abrasive Flow Machining (AFM) means removal of material from a work piece by means of abrasive particles in a fluid-like state. AFM started in 1960s as a method to deburr, polish and radius difficult to reach surfaces like intricate geometries and edges. Depending upon the nature of movement of the abrasive media, AFM can be classified as one way AFM, two way AFM and orbital AFM. The major performance parameters in AFM are extrusion pressure, abrasive concentration, abrasive size, number of cycles and hardness of the work piece. Most of the studies in this field are carried out to assess the material removal rate (MRR) and surface finish obtained with the process variables. AFM is capable of producing surface finish of the order 0.05 $\mu$ m, deburring holes as small as 0.2 mm and radiusing edges from 0.025 mm to 1.5mm. The process capability of AFM can be increased by rotating the viscoelastic media along with the reciprocating movement of the media, which is named as centrifugal force assisted abrasive flow machining (CFAAFM). Magneto rheological abrasive flow finishing (MRAFF) can be used to improve the MRR and surface finish further. In MRAFF magnetic fields of different strength is applied across the work piece and viscoelastic media.

**KEYWORDS:** Abrasive Flow Machining, Material Removal, Surface Finish, Magnetic Field Assisted Abrasive Flow Machining, Centrifugal Force Assisted Abrasive Flow Machining, Magneto Rheological Abrasive Flow Finishing