



Development of a Metal Removal Model using Spherical Ceramic Media in a Centrifugal Disk Mass Finishing Machine

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Abstract: This research treats a moving workload, consisting of ceramic media and metal work pieces, as a pseudo-fluid in a centrifugal disk mass finishing machine and utilizes appropriate fluid-dynamic theory and numerical analysis (CFD) to model the workload motion in the machine. Physical weight loss experiments with triangular, cylindrical and spherical media proved that only spherical media was acceptable for use. This media was used to obtain material removal rates from cylindrical aluminum, brass and steel coupons and generated a material removal model that relates metal removal rates to the ratios of the density and hardness of the metal coupons and media respectively, with a maximum deviation of about 16%. In addition, regardless of media shape, abrasive content in media was directly related to rate of media weight loss. Also, decreasing rates of media weight loss were observed for triangular, cylindrical and spherical media.

Keywords: Centrifugal disk mass finishing. Material removal rate. Spherical ceramic media

This paper can be found at <http://www.springerlink.com/content/7w5k4qw00210p378/>