

Densification and workability study on non-linear deformation of aluminium composite during hot swaging

A. Rajeshkannan¹ R. S. Devi²

¹**Dr. A. Rajeshkannan**, Ph.D., Senior Lecturer, Department of Mechanical Engineering, School of Engineering & Physics, Faculty of Science, Technology and Environment, The University of the South Pacific, Laucala Campus, Suva, Fiji. Ph. No. +679 3232695, Email: ananthanarayanan_r@usp.ac.fj

²**Dr. (Mrs.) R. S. Devi**, Ph.D., Assistant Professor, Department of Commerce, ANJA College, Sivakasi, Tamil Nadu, India. Email: devirs25@gmail.com

Abstract:

Upsetting exercise usually carried out to investigate metal flow characteristics. The composite produced in the present investigation is through powder metallurgy processing, thus in addition to the metal flow characteristics which are studied in the form of workability, also undergoes densification changes. Hence, both densification and workability characteristics are the objective of study on the chosen aluminium matrix composites. The aluminium composites are having inheritance advantage especially the high specific strength and so its potential applications in various field, which drives to pay attention in the present investigation. Since the upsetting exercise is carried out, it is envisaged the bulging at the free deformation surface; is an indication of non-linear deformation. So, apart from revealing the aforementioned characteristics comprehensively under bulging it is also subjected to statistical treatment to reveal its true influence on the characteristics under given process conditions.

Keywords: Densification, Workability, Bulging; Composites, ANOVA

Introduction:

The cylindrical material under axial loading will undergo free deformation in hoop region, where it experiences tensile forces which subsequently leads to fracture development in that region. On the other hand, the top and bottom surface of a material is in contact with the dies that are subjected to normal and frictional forces, consequently leads to densify the powder