



Effect of Processing and Nano scale Reinforcement on the cold forming of Al-TiC Composites

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Abstract: An investigation on mechanism of deformation and densification behaviour of the Aluminium (Al)-Titanium carbide (TiC) Nanocomposite has been taken out by cold upsetting. Current work has been carried out on the workability behavior of Al composite reinforced with TiC (5% with particle size below 200 nm) under Uni-axial stress state conditions. The Al-TiC composite was produced using high energy planetary ball milling. Cylindrical preforms along with initial theoretical density of 85% possessing three different aspect ratios (0.5, 0.75 and 1.0) were prepared using a die and punch assembly with a 100 tones capacity Compression Testing Machine. The preforms were sintered in an electric muffle furnace at 575°C, and subsequently furnace cooled. Incremental deformation steps were used for conducting the Cold deformation experiments. Lower aspect ratio exhibit enhanced densification and load-bearing capacity compared to that of higher aspect ratio performs. Density become uniform and quite easily due to rapid load transfer resulting in an extensive work-hardening. An attempt is also made to establish relationships between various parameters such as stress & strain and is evaluated.

Key words : Aluminium, Plastic Behaviour, Preform, Characterization, Density, SEM, XRD.

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