**Analysis of Surface Roughness and Wear Resistance in Low Plasticity Burnishing Process using Multi-objective Optimization Technique**

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**ABSTRACT**

Low surface plastic deformation occurred by low plasticity burnishing (LPB) process is studied to improve mechanical properties of components. In the present study , multi-objective optimization of low plasticity burnishing process parameters on aluminum alloy AA6061T6 has been carried out. Burnishing process parameters each of 4 levels such as pressure , speed , ball diameter , ball material and number of passes are considered. Response parameters such as surface roughness and wear resistance are considered. During experimentation, L16 orthogonal array has been used by considering Taguchi method design matrix.

Multi-objective optimization has been carried out in current research work by Grey Relational Analysis (GRA) technique. The Technique is found useful to minimize surface roughness and maximize wear resistance. The multi-objective optimization results revealed that burnishing pressure and speed are the significant parameters for minimizing surface roughness and maximizing wear resistance.

*Keywords: Low Plasticity Burnishing , Surface Roughness , Wear Resistance, Grey Relational Analysis .*