

Experimental Investigation and Optimization of Coaxiality Error Analysis with CNC Turning Process on Delrin for Assembly Fit

Dr. T. Rajesh Kannah¹, Adhithyan S², Ajay A³, Manikandan P⁴, Sugan B⁵

Professor, Department of Mechanical Engineering¹

Student, Department of Mechanical Engineering^{2,3,4,5}

Anjalai Ammal Mahalingam Engineering College, Thiruvarur, Tamil nadu, India.

rajeshkannahiitm2020@gmail.com and adhisakthi02@gmail.com

Abstract: *This paper mainly deals with the machining operation like turning operation, Material Removal Rate and Surface Roughness are the important parameter which is to be considered for quality product. The material selected for the experiment is DELRIN 500. Turning is one of the important processes that is widely used to create cylindrical components and it is also used for surface finish the product to make it smooth. Nowadays, plastic materials are widely used for making variety of components. To make a component with high dimensional accuracy, turning operation is used. The main concerns of turning are tooling cost and the effect of process on machinability characteristics. It can be seen that the output responses value has a minimum roughness average and a high degree of geometrical quality precision. High degree surface finish is induced by medium speed, feed rate, and small nose radius. The coaxial error was minimized by using medium speed, feed and larger nose radius. Experimentally found that third specimen (RPM -750) (FEED -0.08 mm/Rev) and (NOSE RADIUS 0.8) obtained minimum geometrical error along with minimum Surface roughness. Delrin is a crystalline plastic that offers an excellent balance of properties that bridge the gap between metals and plastics. Delrin possesses high tensile strength, creep resistance and toughness. It also exhibits low moisture absorption*

Keywords: turning operation