ABSTRACT

Workpiece deformation during machining is a serious defect for high precision machining. This phenomenon is prevalent to the workpiece at which a low degree of rigidity design is adopted, such as in thin-wall component. As 95% of the thin wall component material volume will be scrapped out during the machining process. It gained highly to the cost of machining the workpiece, the company is prospected to lose even more when defects occur to these workpieces. Previous studies also suggest that machining parameters contribute to the possibility of experiencing this deformation defect. The present study Taguchi method implied exhibits the preferred machining parameters engendering the least deformed workpiece. The aluminium samples were selected and machined according to $L_9(3^3)$ orthogonal array design with three parameters (feed rate (f), spindle speed (s) and depth of cut (d)) and three levels. The deformation data was gathered by subtracting the thickness of the machined samples from the initial condition at 81 sites. Eventually, the minimum deformation (0,055mm) was obtained at f= 700 mm/min, s= 1600 rpm, and d= 0,5 mm. This machining parameter does not have a statistically significant effect on the value of the deformation. Increasing machining parameter contributes 29.33% deformation value for depth of cut, 28.68% for spindle speed, and 22.85% for feed rate.

Keyword: *Thin Wall Component, Deformation, Taguchi Method*