Optimization of turning parameters in CNC machining using Taguchi Approach

Abstract— Turning operation is the most common and widely used machining operation. The modern way is to use CNC machines for turning operation which provides a precise control on operating parameters. Step turning using CNC machines is widely used operation among the manufacturing of automotive and aerospace components. Such applications require high quality products with no or minimum post operations. Therefore, it is required to obtain the optimum values of various controllable input parameters that can give optimum desired output. Taguchi method is an extensively used method for this purpose, which provides optimum output from minimum number of experiments which alters the output. Present work is to find the optimum surface roughness for the three input parameters of spindle speed, depth of cut and feed rate. By this approach process parameter and their optimal settings is investigated. During machining operation influence of process parameter and their interaction during machining is also analyzed. This has been reported that depth of cut is the most influencing parameter on surface roughness.

Keywords— Turning operation, Optimization, CNC, Surface roughness, Taguchi methods