Optimization And Experimental Investigation Of EDM Process Parameters Using Copper&Brass Electrodes On EN21&EN32 Stainless Steel On Rotary Fixture EDM

Abstract

Electrical discharge machining (EDM) is one of the most accurate non traditional manufacturing processes available for creating tiny apertures, complex or simple shapes and geometries within parts and assemblies. It is a process for shaping hard metals and forming deep complex shaped holes by arc erosion in all kinds of electrically conductive materials where the tool is not contact with work piece. Erosion pulse discharge occurs in a small gap between the work piece and the electrode. This removes the material from parent metal through melting and vaporizing in presence of dielectric fluid.

In recent years, EDM researchers have explored a number of ways to improve EDM process parameters such as electrical parameters, non-electrical parameters and tool electrode based parameters. Most publications on EDM process are directed towards non-rotational tools, this work shares the same objectives of achieving more efficient metal removal rate and improved surface quality, by developing a rotary fixture and rotating work piece which creates a relative motion between the tool and work piece, this work aims at improving the machine output of rotary electrical discharge machining (REDM) . The objective of this study is to experimental analyzing the parameters like metal removal rate , surface roughness by varying input parameters ,obtained by the rotation of work piece using rotary fixture and the stationary work piece machining . A combination of two advanced materials which stainless EN21, EN32 steel as work piece on copper and brass electrode. Scanning electron microscopy (SEM) was applied to analyse the surface integrity, as well as the

migration of electrode material elements to machined surface by setting an offset range for the tool and the work piece we can perform the contouring operation which we cannot do on the traditional EDM.