

# OPTIMIZATION OF PROCESS PARAMETERS ON AISI H13 STEEL WITH CRYOGENIC COOLED COPPER ELECTRODE IN EDM

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## ABSTRACT

Electric discharge machining (EDM) is widely used process in manufacturing high-precision components from extremely hard and exotic metal. Cryogenic is a process that uses cryogenic temperatures to modify materials to enhance their performance, not much work has been reported in the investigation of effect of Cryogenic Treated electrode while used as a tool in EDM. AISI H13 chromium hot-work steel is widely used in hot and cold work tooling applications. Due to its excellent combination of high toughness and fatigue resistance, H13 is used more than any other tool steel in tooling applications. Investigations were conducted on the machining of AISI H13 tool steel via Cryogenic Cooled copper electrode in electrical discharge machining (CCEDM). The Minitab software was used for experimental results to optimized parameters of process on the basis of orthogonal array of Taguchi L9. The analysis indicated that parameters at which maximum material removal rate(MRR) (23.738mm<sup>3</sup>/min) obtained was 20A discharge current and 45V gap voltage, minimum tool wear rate(TWR) (0.0199gm/min) was obtained at 10A current and 65V voltage and minimum surface roughness(SR) (5.982μm) was obtained at 10A current and 200μs.