This paper presents an experimental investigation on the coated carbide cutting tool performance of aluminium alloy AA6061-T6 machining through end mill processes using the minimum quantity lubrication (MQL) technique. The process parameters including the cutting speed, depth of cut and feed rate are selected. The effect of the base fluid ratio (water: EG) to the hybrid nanocoolant was investigated in this experiment. The hybrid nanocoolant with 80:20 of volume concentration up to 0.1% was prepaid with a 21 nm particle size of TiO2 and 10-30 nm ZnO nanoparticle for measurement purposes and tested at cnc end milling machines. The analysis of the variance method is utilised to validate the experimental data and to check for adequacy. The response surface method was used to develop the mathematical models and to optimise the machining parameters. It is observed that the material removal rate depends significantly on the depth of cut and feed rate, followed by the spindle speed. The results can be used as an example of the minimum quantity lubricants (MQL) technique applied to the machining of aluminium alloys, providing economic advantages in terms of reduced the machining costs and better machinability.