

## **OPTIMIZATION OF CUTTING PARAMETERS BY TURNING TITANIUM MATERIAL USING CBN TOOL**

**A. V. N. L. SHARMA, G. KRISHNAIAH,  
V. AJAY KUMAR AND P. SANDEEP KUMAR**

Swarandhra College of Engineering & Technology, Narsapur – 534 280, India

### **Abstract**

Hard turning is a technique that can be used in the Finishing operations for titanium material (HRC38and above). The introduction of developed CBN cutting tools has made hard turning. This study was undertaken to investigate the performance of finish hard turning of TITANIUM (Ti-6Al-4V, HRC 37- 38). Various cutting speeds:25,45,100,135,150 m/min and various feed rate : 0.05,0.075,0.1,0.125,0.135 mm/rev and depth of cut : 0.08,0.05,0.1,0.125,0.16 mm were employed. Turning was done under wet cutting condition. Cutting forces, surface Roughness and tool life were investigated. The cutting forces, tool life and surface roughness models were developed using the five level full factorial designs. The mathematical models developed are statistically valid and sound, particularly for Fr, Fc, Ft and tool life, surface roughness. Finally the study combined regration analysis (mini-tab), utility concept and RSM method for predicting the optimal Setting. Optimal result was verified through confirmatory test. This indicates Application feasibility of the RSM techniques for Optimization and off-line quality control in turning operation.

-----  
**Keywords** : surface roughness, optimization, RSM method, Regret ion analysis