

**Title:** Machine Tool Characteristics.

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**Abstract:** Cutting tool characteristics were examined with respect to the effects of the machine controlled parameters and tool geometry on cutting phenomenon. This subject has been a matter of prolonged interest to machine tool designers and users alike as it is the basis on which tool life and hence general metal cutting economics are evolved. Most previous research works concentrated on temperature generation usually without recourse to the combined effects of the machine controlled parameters and tool geometry. This missing link is supplied in this work. Basically, the findings in this work show that the cutting speed has a great influence on the forces and temperature and hence on tool life as well as the machining economics. The feed has similar but less influence on these quantities. The cutting efficiency expressed as compression ratio is also influenced by both the speed and feed. However, the influences of speed and feed on the compression ratio are in opposing direction.

**Keyword:** Machine tool, cutting operation, tool life