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Life Prediction of Cutting Tool by the Workpiece Cutting Condition

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Abstract : Stops to exchange cutting tool, to set up again the tool in a turning operation with CNC or to measure the workpiece dimensions have a direct influence on production. The premature removal of the cutting tool results in high cost of machining since the parcel relating to the cost of the cutting tool increases. On the other hand, the late exchange of cutting tool also increases the cost of production because getting parts out of the preset tolerances may require rework for its use when it does not cause bigger problems such as breaking of cutting tools or the loss of the part. Therefore, the right time to exchange the tool should be well defined when wanted to minimize production costs. When the flank wear is the limiting tool life, the time predetermination that a cutting tool must be used for the machining occurs within the limits of tolerance can be done without difficulty. This paper aims to show how the life of the cutting tool can be calculated taking into account the cutting parameters (cutting speed, feed and depth of cut), workpiece material, power of the machine, the dimensional tolerance of the part, the finishing surface, the geometry of the cutting tool and operating conditions of the machine tool, once known the parameters of Taylor algebraic structure. These parameters were raised for the ABNT 1038 steel machined with cutting tools of hard metal.

Keywords : machining, productions, cutting condition, design, manufacturing, measurement
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