

Investigation on Machine Tools Energy Consumptions

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Abstract : Several researches have been conducted to study consumption of energy in cutting process. Most of these researches are focusing to measure the consumption and propose consumption reduction methods. In this work, the relation between the cutting parameters and the consumption is investigated in order to establish a generalized energy consumption model that can be used for process and production planning in real production lines. Using the generalized model, the process planning will be carried out by taking into account the energy as a function of the selected process parameters. Similarly, the generalized model can be used in production planning to select the right operational parameters like batch sizes, routing, buffer size, etc. in a production line. The description and derivation of the model as well as a case study are given in this paper to illustrate the applicability and validity of the model.

Keywords : process parameters, cutting process, energy efficiency, Material Removal Rate (MRR)

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