

Evaluation of minimal quantity lubrication effects on surface roughness in milling with coated and uncoated tools using kurtosis quantification method approach

Norlida Jamil , Mohd Fawzi Zamri, Ahmad Razlan Yusoff*

Kolej Kejuruteraan, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300, Gambang,
Kuantan, Pahang, Malaysia.

*Corresponding e-mail: norlidajamil@gmail.com

ABSTRACT

The present work's main contribution is applying kurtosis quantification to analyse complicated or random type of milling vibration signals under dry and minimal quantity lubrication (MQL) to achieve good surface quality. The milling process is carried out using coated and uncoated cutting tools on ductile iron under the selected MQL volume flow rate parameter. The results obtained from kurtosis and skewness measurement are then verified with average surface roughness measurement (Ra). From the experimental work, it was found that kurtosis demonstrate the effectiveness on feature extraction. The dry milling using uncoated tools contributes high values of vibration signals and surface roughness. Meanwhile, the Ra values improvement, which reduces by 70% when MQL is applied.

KEYWORDS

Kurtosis quantification; Acceleration signal; Minimal quantity lubrication (MQL)

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