Review

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PII: S0263-2241(14)00354-6
DOI: http://dx.doi.org/10.1016/j.measurement.2014.08.035
Reference: MEASUR 2962

To appear in: *Measurement*

Received Date: 13 May 2014
Revised Date: 17 July 2014
Accepted Date: 14 August 2014

Please cite this article as: C.H. Lauro, L.C. Brandão, D. Baldo, R.A. Reis, J.P. Davim, Monitoring And Processing Signal Applied In Machining Processes – A Review, *Measurement* (2014), doi: http://dx.doi.org/10.1016/j.measurement.2014.08.035

MONITORING AND PROCESSING SIGNAL APPLIED IN MACHINING PROCESSES – A Review

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Abstract: In machining processes several phenomena occur during material cutting. These phenomena can affect the production through the reduction of quality or accuracy, or by increasing costs (tools, materials, time). Thus, an understanding of machining phenomena is needed not only to define the cutting parameters for maximizing production, but also to ensure worker safety. An easy way to identify these phenomena is by monitoring machining processes, such as the measurement of cutting force, temperature and vibration. The acquired signal can have information about tool life, quality of cutting and defects in the workpiece. This review paper discusses the first steps involved in choosing and defining various techniques that may be used to monitor machining processes. Furthermore, this paper also outlines the techniques to acquire and process the signals of the monitoring processes. Hence, the objective of this paper is to help the reader understand the procedures for monitoring machining processes, and define methods, parameters, targets and other factors involved in doing so.

Key-works: Monitoring; Signal processing; Machining.

Nomenclature

AE	Acoustic Emission
C/N	Coulomb per Newton
CNC	Computer Numerical Control
CQF	Conjugate Quadratic Filters
CWD	Choi-Williams distribution
CWT	Continuous Wavelet Transforms
DCT	Discrete Cosine Transform
DFT	Discrete Fourier Transform