

# Multivariate Statistical Process Control Charts and the Problem of Interpretation: A Short Overview and Some Applications in Industry

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## *Abstract*

Woodall and Montgomery [35] in a discussion paper, state that multivariate process control is one of the most rapidly developing sections of statistical process control. Nowadays, in industry, there are many situations in which the simultaneous monitoring or control, of two or more related quality - process characteristics is necessary. Process monitoring problems in which several related variables are of interest are collectively known as Multivariate Statistical Process Control (MSPC). This article has three parts. In the first part, we discuss in brief the basic procedures for the implementation of multivariate statistical process control via control charting. In the second part we present the most useful procedures for interpreting the out-of-control variable when a control charting procedure gives an out-of-control signal in a multivariate process. Finally, in the third part, we present applications of multivariate statistical process control in the area of industrial process control, informatics, and business.

***Index Terms*** - Quality Control; Process Control; Multivariate Statistical Process Control; Hotelling's  $T^2$ ; CUSUM; EWMA; PCA; PLS; Identification; Interpretation.

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