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The Parameter Diagram as a DoE Planning Tool

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Statisticians are often called upon to work together with Subject Matter Experts (SMEs) to perform Design of Experiments (DoEs). The statistician may have mastered DoE; however, the SME's input may be critical in determining the correct factors, levels, and response variable of interest. The SME may be an engineer or even the machine operator responsible for the daily activities at the process that is being considered for a DoE. They may not understand what a DoE is or what is needed for a DoE. To facilitate DoE planning, a Parameter diagram (p-diagram) may be helpful. A p-diagram is not a new tool and it is often used in the automotive industry for the creation of Design Failure Modes and Effects Analysis. The use of a p-diagram as a DoE preparation tool, however, is a new application of the concept.

This talk will describe the p-diagram and its application in DoE. Examples will be presented using actual DoEs from the literature. These case studies are the identification of the AA battery configuration with the longest life, improving the quality of a molded part, increasing the life of a molded tank deterrent device, and the optimization of a silver powder production process. After attending this talk, participants will be able to use a p-diagram for DoE planning.

Keywords

DoE p-diagram planning

Special/invited session

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