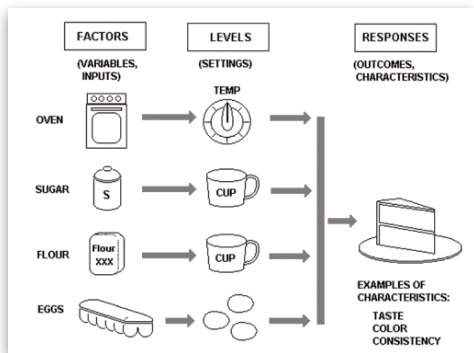


KERELAW SOLVES PRODUCT ISSUE USING DOE

Process Fully Evaluated | Coupled Factors Identified | Problem Solved

New York, NY - February 13, 2017: The operations and engineering groups were perplexed. An intermittent and safety-critical product failure was once again found during final inspection at their Delaware manufacturing facility. Many explanations were offered, often based on anecdotal experience, and potential solutions were tried one by one. Each failed to correct the problem. It soon became a serious issue as rejected product accumulated and shipping targets were missed. They needed a fix, and fast.



Design of Experiments (DOE) is a statistical tool that rates the probability of root causes using a minimal number of test runs.¹

That's when Kerelaw stepped in. First, Kerelaw interviewed the company's engineers, supervisors and operators to fully define the scope of the problem; when it was first occurred, the frequency of occurrence, how it was found, etc. Next, Kerelaw led the company's team to review product design intent and observe manufacturing methods. Using the objective information obtained from these steps, the group collectively defined the most likely root causes of the product failure. These root causes became factors for a Design of Experiments (DOE) evaluation.

DOE is a controlled experiment methodology that evaluates the relative effect of input variables (factors) and the specific settings of these variables (levels) on the measurable results (responses), which in this case is product performance at final inspection. A high and low level was defined for each factor and new experiments were conducted per the DOE matrix, completed within one day. The responses were analyzed using statistical methods and the influence of each factor/level combination on product performance were defined.

Solved! The DOE results highlighted the coupled effects of an out-of-spec component and an overly aggressive process operation,

confirmed with additional empirical testing. Engineering reviewed drawings, routings and process sheets to ensure the instructions were correct and easy to understand. Operations reinforced the proper manufacturing process through additional operator training and oversight. The intermittent failures decreased and eventually went away. Shipping targets were met again.



To ensure product function, mechanical components must meet drawing requirements after finishing.

Kerelaw Engineering

Kerelaw Engineering, based in New York City, provides Advanced Design and Development Services for a wide range of clients. For more information, visit www.kerelaw.com.

How can Kerelaw find data driven solutions to your challenges?

¹ <https://www.moresteam.com/toolbox/design-of-experiments.cfm>