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Comparison of an Unreplicated Factorial Design versus a Full Fractional Design for a Mixture Robust Process

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Abstract: The Robust Parameter Design (RPD) intends to make products and processes insensible to sources of variability. Therefore, it is important to identify the causes of variation in the process and the environment. However, if there are mixing factors in the process, then it must also consider the proportions of each of them and thereby obtain a robust product. In order to consider noise and mixing factors, crossed designs must be conducted. These designs require a lot of information across internal and external arrangements; unfortunately, it is not always possible to run a full factorial design and it is even more difficult to replicate it. This constraint, leads us to analyze an unreplicated design and compare it against a split design to evaluate the performance of both.

Keywords: Mixing, Robust Design, Split Design, Unreplicated