

**Title:** Which Design of Experiment is best for me? A comparison of different DoE strategies.

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**Area:** CMC (Chemistry, Manufacturing and Control)

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### **Presentation summary**

Understanding the effect of process parameter settings on the critical quality attributes of a manufactured product is crucial for the development and control of an efficient and robust production process.

To gain information on these relationships and to define optimal setpoints for the process parameters, usually a set of experiments is conducted. The design of the experiments (DoE), that is, the setting of the process parameter values for each experimental run, can be determined by applying a broad range of strategies. They can aim to increase cost effectiveness, to maximize the overall amount of information, minimize the width of blind spots, etc. Often used strategies are full factorial designs, central composite, Box-Behnken, or the D- A- and I-optimal designs.

Each strategy has different strengths and weaknesses, and the effectiveness and suitability of these techniques can vary depending on the specific context and objectives. In this presentation I will give an overview of common DoE strategies and compare them with respect to several performance parameters (e.g., power, width of uncertainty intervals) and I will discuss their robustness against misspecifications, lack of fit, or addition of uninformative factors in simulation studies with and without model selection.