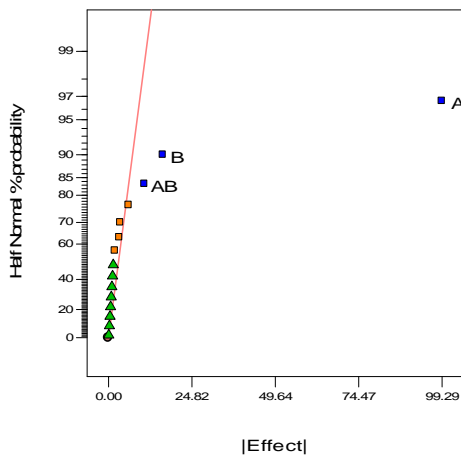


Design of Experiments

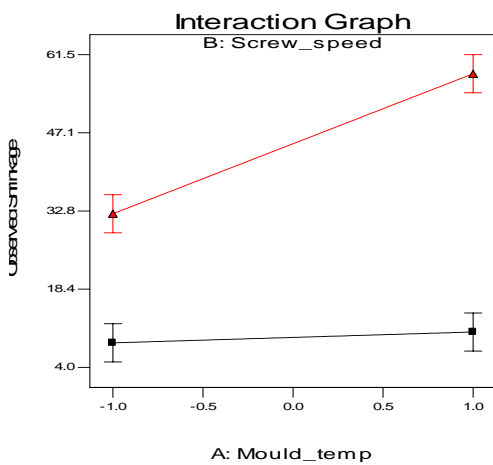
What is it ?

Design of Experiments (DoE) is a powerful tool to enable you to better understand your product or process. Let's suppose you are dealing with a product or process on which one or more key response variables (the y's) are measured that are a function of potentially many input variables (the x's), i.e., $y = f(x_1, x_2, x_3, \dots, x_k)$. DoE offers a logical, information rich and efficient framework to enable you to:

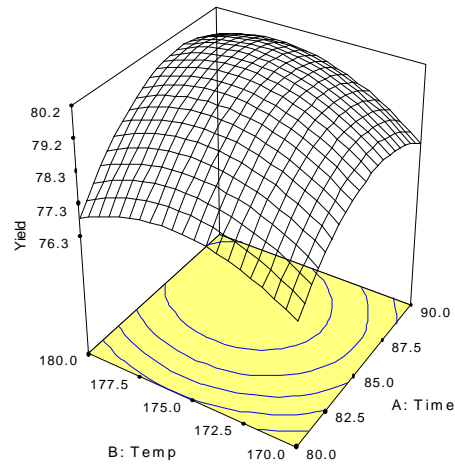
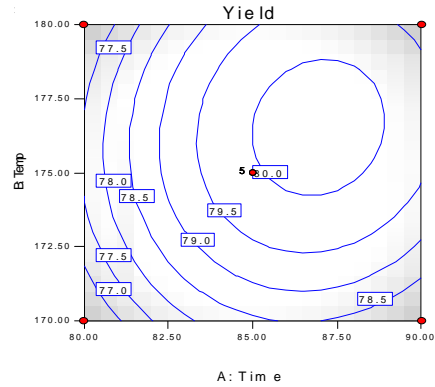
- Screen potentially large numbers of input variables to identify the critical few



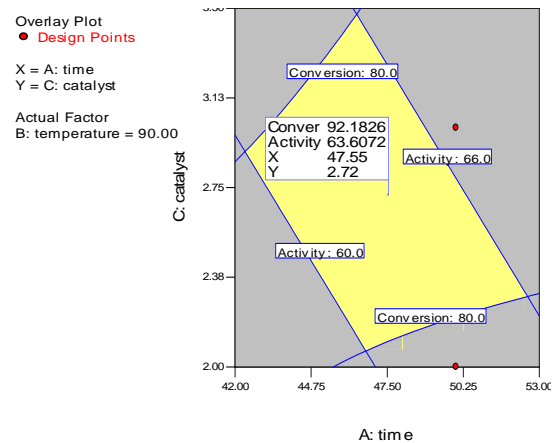
- Investigate whether or not the critical input variables act synergistically, i.e., do the input variables interact with each other to increase the response ?



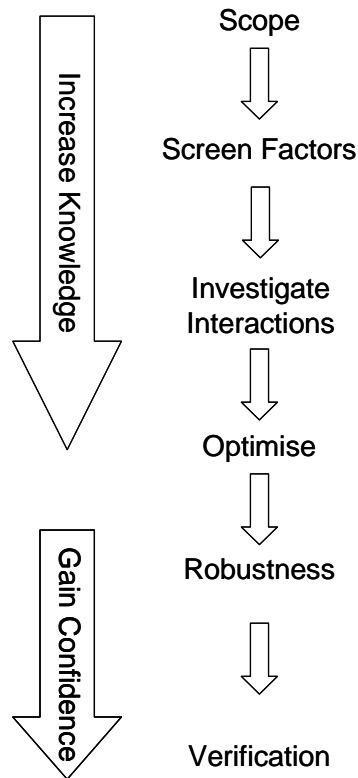
- Identify the levels of critical input variables that will optimise key response variables



- Establish a robust operating window that will ensure that your product or process will remain within specification



DoE enables you to build up knowledge of your product or process sequentially



Workshop

The workshop takes place over two days. On Day 1 you will learn

- how to use efficient two-level Factorial designs to screen large numbers of input variables to identify the ones that are critical
- how to investigate if interactions exist between critical input variables
- how to manage uncontrollable sources of variation such as raw material or environmental variation in your designs
- how to use the same designs to have confidence that your product or process is robust
- On Day 2 you will learn
 - how to use response surface DoE optimise your product or process.
 - how to sequentially build your designs up from screening to response surface designs.
 - how to simultaneously optimise a number of response variable and

identify a robust operating window for your product or process

This is a practical hands-on workshop designed to help you to use DoE tools to increase knowledge and confidence about your products or processes. The training materials will consist of hands-on practicals using relevant examples.

Examples that are relevant to you will be incorporated into the training materials. Some of the workshop examples will make use of an Excel based simulation tool that allows you to simulate results for the response variable(s) for each experimental run in the DoE plan (as if you were executing the DoE plan for real). This facilitates 'learning by doing' rather than by instruction and it will enable you to get valuable practical experience throughout the workshop which will ensure that you will be able to immediately use the tools on your own products and processes afterwards.

The workshop will be run using your preferred statistical software package, e.g., Design Expert, Minitab or JMP.

Benefits to you

At the end of the workshop you will be able to design and analyse your own experiments that make best use of limited resources to:

- Identify critical input variables
- Establish a process operating window and have confidence that it is optimised and robust
- Construct a map of your product or process that will enable you to troubleshoot problems during technology transfer or scale-up.