

# Case Study #57 – Winding Yield

## The Circumstance:

The product is a wound strand which is the problem child within its product family. The mission is to quickly improve yield on the problem child and hopefully translate these findings to the entire product family as well.

## The Approach:

In a brainstorm session, 123 ‘anything goes’ ideas are procured to improve yield. Each of these is reviewed and 30 of them are deemed doable immediately (on shippable goods.) The ideas span all processing steps, being slight changes in things like speeds, targets, pressures, thicknesses, tensions, angles, etc. All tested ideas are zero cost to test and implement as well.

An experiment is designed which calls for 64 treatment combinations. Doing these enables us to learn about 1 billion+ combinations of these idea’s settings, along with 435 two-factor interactions between them. (A two-factor interaction is where the influence an input has on an output is dependent on the setting of another input.)

Over a period of a few weeks, several thousand strands are wound under these 64 experimental combinations. During this time yield suffers but we know why early. It is the low end range of one of our raw material specifications. It is decided to continue with this pre-made material despite the loss.

## The Outcome:

Once all experimental runs are complete, analyses are performed to determine the impacts of the 30 factors on yield, along with 19 other metrics of product and process performance. A collection of factors emerge as influencing yield, with the top two being due to the low end range of the raw material specification mentioned above. A newly prescribed SOP, based on experimental findings, is immediately implemented (only readily implementable solutions were tested, so this could be easily done.) Yield (%) is forecast to be 4+ % pts. higher than previous SOP and is immediately obtained. These findings translate to the entire product family providing record breaking cell performance.

