

Case Study #42 – Blending Yield

The Circumstance:

The product is a flouro-polymer fiber. The mission is to improve yield and do so quickly. This process is high volume so any small improvements (or degradations) matter. Needless to say the sooner improvements are in hand the better.

The Approach:

In a brainstorm session, 89 ‘anything goes’ ideas are procured to improve yield. Each of these is reviewed and 22 of them are deemed doable immediately (on shippable goods.) The ideas span all processing steps, being slight changes in things like time, temperatures, tensions, flow rates, speeds, etc. All tested ideas are zero cost to test and implement as well.

An experiment is designed which calls for 48 treatment combinations. Doing these enables us to learn about 4,000,000+ combinations of these idea’s settings, along with 231 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 four shifts, several dozen blends are produced under these 48 experimental combinations. During this time yield is slightly better than before the experiment.

The Outcome:

Once all experimental runs are complete, analyses are performed to determine the impacts of the 22 factors on yield, along with 37 other metrics of product and process performance. Three factors emerge as having a statistically significant influence on yield. 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 2.1% higher than previous SOP and is immediately obtained.

