Case Study #43 – SLOGS Ratio

The Circumstance:

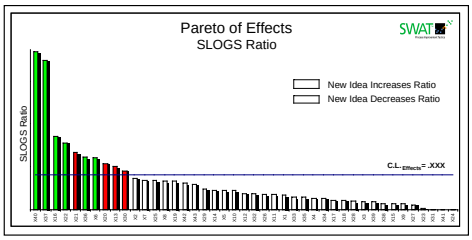
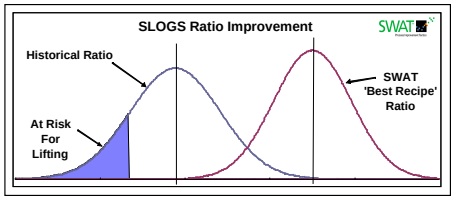
The product is a specialty film. The problem is seam tape lifting off of this film. The mission is to substantially increase the 'SLOGS ratio' which is a measure of the tendency for seam tape to lift; the higher the ratio, the less tendency to lift.

The Approach:

In a brainstorm session, 143 'anything goes' ideas are procured to remedy the problem. Each of these is reviewed and 38 of them are deemed doable immediately (on shippable goods.) The ideas span all processing steps, being slight changes in things like times, temperatures, angles, rpm's, pressures, speeds, etc. All tested ideas are zero cost to test and implement.

An experiment is designed which calls for 88 treatment combinations. Doing these enables us to learn about 274 billion combinations of these idea's settings, along with 703 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 the next few weeks a few hundred production film rolls are made under these 88 combinations. During this time yield is slightly better than before the experiment and output is slightly lower.

The Outcome:

Once all experimental runs are complete, analyses are performed to determine the impacts of the 38 factors on the SLOGS ratio as well as 10 other measures of product and process performance. A collection of factors emerge as significant, two of which are extremely potent. One of these is considered highly counter-intuitive to common logic. A newly prescribed SOP, based on experimental findings, is immediately implemented (only readily implementable solutions were tested, so this could be easily done.) The SLOGS ratio is forecast to average greater than has ever been attained. This is immediately obtained. Process capability is increased from a C_{pk} of .34 to 1.80. Seam tape lifting is eliminated.