US Resistor Manufacturing Project

Overview
U.S. Resistor Inc. was having an issue dealing with the part to part spread on the final resistance value of their resistors after processing. There was a wide range of resistance values for parts that have been made together and thus re-processing and testing must occur to “trim-in” parts.

Objectives
Through controlling and monitoring each individual process leading up to the sintering and metallization, the source of variation will be identified. Once identified a possible solution to the variation will be suggested.

Approach
- Learned overall resistor production process through onsite tour
- Inquired with sponsor, operators, and independent research for probable source of variation
- TempTabs were inserted into the oven and correlated with individual resistor resistance value
- Moisture content level of stored materials were analysed
- Various MESH sizes were placed in the screening machine
- MESH data was analysed with confidence intervals

Outcomes
- Moisture content was ruled out as a possible source of variation.

- Although furnace data came out inconclusive, the next step would be to monitor the temperature throughout sintering (maybe with thermocouples) to easily identify hotspots

- A particle size of +70 MESH in the screener produced the smallest amount of variance in the overall resistance value of final parts. It is suggested the company do more testing at this smaller MESH size to decrease their part to part variation