

SPX Newsletter



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York Thermoformer Team

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Monthly article

Every month, the York team will provide the Human Resources team with information regarding events that have impacted the York facility. We look forward to sharing our successes and challenges.

York's Six-Sigma project - *Thermoformer Analysis*

In December 2008 the York team began working with consultant Charlie Carpenter of Process Predictability Management, Inc. Our goal was to improve quality and throughput on our PVC3 thermoformer, therefore our initial focus was to collect key functionality and variance data. The data analysis comprised regression and analysis of variance (anova) which defined the operating window targets for the MVC20 thermoforming process variables. During a sixty day period, beginning in December 2008, team members captured the required data every hour during our two shift operation

Overview of the thermoformer process

The thermoforming process involves heat transfer, heat removal, and cooling of the PVC roll stock in order to create fill packs for cooling towers. PVC plastic is heated to a target temperature and then rapidly cooled during the vacuum forming process to reach a target temperature.

Data collected

- **Mold close time**
- **Raw Material temperatures**
before oven, after oven, and after forming
- **Ambient conditions**
shop temperature and relative humidity
- **Thermoformer material**
TCU temperatures, top and bottom temperatures, chain rail cooling temperatures, mil thickness, and index speed (chain)
- **Process outputs**
Formed mil thickness and seconds per cycle

Process Variables

Mr. Carpenter also worked with the York & Olathe team on Quality Function Deployment (QFD) analysis which was used to identify and qualitatively assess the impact that variables across the thermoforming process have on the critical to quality customer requirements.

Result- *York improved quality, increased throughput, reduced scrap PVC sheets, reduced downtime, reduced overtime.*

Each step of the process and its variation contributors were compared against the visual and measureable customer requirements.

Result- *York improved the quality of PVC sheets which in turn improved fill packs being shipped.*

The field of focus was narrowed so data collection activities could be conducted in a structured manner based upon the quantified inputs of the collective experience of the Olathe Team.

Result- *The York and Olathe facilities began sharing key information on how variation can affect the functionality of the thermoformer*

Summary

As result of the Six-Sigma-Thermoformer Analysis project, York has developed a way to collect data and perform analysis of process variables as it relates to the MVC20 mold. Our plan is to apply this analysis to other molds used in our facility.

The York team would like to acknowledge the invaluable contributions made by Charlie Carpenter. In addition to Mr. Carpenter's vast Six Sigma knowledge he worked directly with team members to explain the concepts in manner that could be easily understood.

The York team would also like to extend our appreciation to the Olathe team; specifically, Glen Jennings, Tim Pullen, Tim Steeger, Bill Payne and Michael Sullivan. Each of these gentlemen went out of their way to share their collective years of experience with the York team.