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## MISSOURI TEAM QUALITY AWARD RECIPIENT

### DEVELOPMENT, EVALUATION, AND OPTIMIZATION OF LK3626

**RTV FOAM TEAM** at the National Nuclear Security Administration's (NNSA) Kansas City Plant, managed by Honeywell Federal Manufacturing & Technologies (FM&T), Kansas City



#### PROFILE

The NNSA's Kansas City Plant manufactures an array of mechanical, electrical and engineered material components for our nation's defense program. The Kansas City Plant employs approximately 3,000 associates at facilities in Kansas City, MO, and Albuquerque and Los Alamos, NM.

#### OPPORTUNITY FOR IMPROVEMENT

The primary vision of the Kansas City Plant is to be the premier provider of secure products and services to protect our nation. A product realization team was formed between Los Alamos National Laboratory (LANL) and the Kansas City Plant to remanufacture a quality cushion for the W76-1 Life Extension Program. Since the original silicone material used to make the cushions was no longer commercially available, a replacement material [LK3626 Room Temperature Vulcanized (RTV) foam] was designed and developed by LANL's materials engineering group. The Kansas City Plant manufactured cushions using the replacement foam but could not consistently meet specific mechanical property requirements. As a result,

the acceptable cushion yield was extremely low.

#### TEAM ACTIONS

The team utilized Six Sigma methodologies to characterize the foam and cushion production processes as well as determine the chemical, physical and thermal property relationships of the individual foam components. A visualization model was created to describe the foam's chemistry and define the relationship between foam chemistry and cushion mechanical properties. Using this model, the team easily identified methods for improvement as well as modes of failure. The team weighted and ranked each identified solution against the LK3626 baseline using a team-generated product scorecard. The team, including stakeholders, identified a formulation that allowed cushions to meet stakeholder and customer requirements of enhanced mechanical properties with sustainable, consistent producibility.

#### RESULTS

As a result of the team's efforts, an optimized foam, SX358, was formulated and characterized. Cushions now meet all of the design requirements with an improved yield. By better understanding the material and its chemistry and realizing how the manufacturing processes can be adjusted to account for material variability, the team avoided spending \$2M+ to start a production line with a commercial supplier. All improvements were accepted by stakeholders. "We are very pleased with the result. This team has allowed us to optimize our research activities by giving us an extremely high-quality product that is an ideal match to our system." (Bruce Trent and Gary Wall, stakeholders)

#### FUTURE PLANS

The team meets regularly to report progress, identify issues and new risks, and verify progress against the project plan. Currently, the team is developing and documenting a methodology for conducting extensive aging studies to support the final formulation choice and contingencies. Future plans include continuously improving the production process using Six Sigma tools and chartering new teams to ensure follow-on activities are implemented in a timely manner.

#### For Further Information Contact:

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