

# The technology of keeping cool

## Manufacturing Alumni

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TRANE Residential Systems is a lean organization. For more than a century the TRANE name has identified products and technology that stretched the world's idea of what was possible; TRANE is a classic American success story that grew into a global one. It began with our founder, James Trane, a Norwegian immigrant who opened his own plumbing shop in La Crosse, WI, in 1885.

With the inspiration of cold Wisconsin winters, James TRANE invented a new low-pressure heating system he proudly called the TRANE Vapor Heating System. His son, Reuben, was just back from college with a degree in mechanical engineering, so father and son began manufacturing operations in 1910 and incorporated as The TRANE Company in 1913. It was Reuben's invention of the convactor radiator in 1923 that firmly established the company's reputation as an innovator, a reputation TRANE people have been building on ever since.

### **Growth through innovation**

The idea of using technology to give people relief from summer heat was a radical and unproven idea when TRANE became an air conditioning pioneer in 1931. TRANE fundamentally changed the concept of air conditioning large buildings with the 1938 launch of Turbovac, the industry's first hermetic, centrifugal refrigeration machine. This was the beginning of a long chain of innovations leading to TRANE's current CenTraVac, the industry standard for large commercial air conditioning systems; this energy efficient system available anywhere for large buildings and it has earned TRANE the "Best of the Best" Award from the U.S. Environmental Protection Agency.

### **TRANE's Lean Initiative**

"Our lean initiative at this plant has been in process for about two years now. However we've had deep roots for over ten years in DFT (Demand Flow Technology) and going so far as to have true mixed model flow production assembly lines now during that time. Our entire Plant level team is by function a lean leader including the plant manager. From a corporate level within our division (TRANE Residential Systems) -- it's mimicked similarly in that all functions are expected to be the lean leaders of our initiative. From a higher level of Ingersoll-Rand -- even our CEO participates in 2 kaizen events a year at different plants, so it's becoming part of our culture for sure," noted John Young, Materials/Supply Chain Leader of TRANE Residential Systems – Vidalia, GA.

TRANE used differing types kanban's with sporadic success across the sites in TRANE Residential. There was no standardization and in most cases the kanban's would not run correctly. Lost cards, no way to re-size efficiently, no visibility for kanban's in process with suppliers, were all challenges.

TRANE came to look at Ultriva as a solution because the organization wanted to implement kanban's and Young felt that based on past experiences, "I wanted some technology enablers to allow us management tools as well. Also, we came across Ultriva as solution due to a Six Sigma Project Team I was helping lead on material planning improvements."

### **Conditions needed Improvement**

Stock outs, too much material, no visibility to parts with suppliers, and no visibility to parts in transit. There was no ability to measure OTD with suppliers; no ability to have real time receipts. Young noted that TRANE Residential, "Needed poka yoke's on receiving process and Material Control needs. We needed access to the data to address increases and decreases in demand for Kanban's and there had to be a Supplier Portal to have visibility into our shop floor. All this was needed along with the ability to run MRP orders the same as kanban, but just as one-time orders."

TRANE Resident looked at several electronic kanban programs, including a home written one that already existed for internal fabricated parts in the Tyler facility. "In the FMEA of our six sigma project on material planning improvements, Ultriva was able to

move almost all of our highest ranking issues to non-issues through poka yoke's or minimal issues through its superior methodology," suggested Young.

In April 2008 TRANE Residential streamlined their purchasing system as well as streamlining internal management of fabrication department, providing the ability to manage capacity visually. The company officially moved to a consumption-based replenishment purchasing with real-time bar-coded receipts with poka-yoke (cannot double receive or double order); the company now has a Total Closed loop procurement (internal and external for kanban's producing a much cleaner value stream mapping process.)

#### **Specific Benefits of Consumption-based Replenishment:**

- \$4.7 Million in Material savings through successful implementation as part of control plan the companies Six Sigma project.
- \$243k savings in 90 days (pilot period).
- Increased turns from low single digits to 25+ on track to hit 33 by year end (measured as COGS).
- Stock outs with no visibility as to why are gone.
- When there is a stock out now, the company knew it was coming and is certain as to root cause in minutes of data analysis.
- OTD metrics for suppliers are now available, none existed previously
- Transit lead time metrics (impossible in other systems).

#### **Expanding the Electronic Kanban:**

The system is being utilized with the entire supply chain, being implemented across the TRANE Residential division. The Ultriva system is implemented on over 85% of Vidalia's spend now. All sites are expected to be on it within 18 months, fully 100% (in TRANE RS Division).

#### **Lean Technology Providing a Competitive Advantage**

According to Young, "This Ultriva system provides a competitive advantage in that we are able to see down to very granular levels of details, what's happening in our supply chain. This analysis tool allows a manager to truly zero in on root cause and remove emotions from analysis and drive data driven decision making. Being able to have full visibility into our supply chain allows us to react to unforeseen circumstances better, react to demand shifts, minimize impact to our financial stakeholders as well as give realistic expectations to internal and external customers."

Ultimately, this lean technology solution has become a major pillar of TRANE's rapid improvements to both the supply chain and internal processes. The Materials & Supply Chain Leader summed up the lean benefits by saying, "The technology is an absolute enabler and makes improvement sustainable and allows us to more rapidly identify and execute on improvements, which of course is the key to lean: continuous improvement."

#### **Author Profile:**

Thomas R. Cutler is the President & CEO of Fort Lauderdale, Florida-based, TR Cutler, Inc, ([www.trcutlerinc.com](http://www.trcutlerinc.com)). Cutler is the founder of the Manufacturing Media Consortium of three thousand five hundred journalists and editors writing about trends in manufacturing. Cutler is a member of the Society of Professional Journalists, Online News Association, American Society of Business Publication Editors, Committee of Concerned Journalists, as well as author of more than 300 feature articles annually regarding the manufacturing sector. Cutler can be contacted at [trcutler@trcutlerinc.com](mailto:trcutler@trcutlerinc.com).