

## **Implementing the Principles of Lean Manufacturing at Semicon Associates Samarium Cobalt Magnet Facility**

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Semicon Associates Samarium Cobalt Magnet Facility produces medium volume product mainly for the traveling wave tube industry. In order to gain a competitive edge in the market, a decision was made to implement lean manufacturing principles. Lean Manufacturing is a systematic approach to identifying and eliminating waste (non value added activities) through continuous improvement by flowing the product at the pull of the customer. In the past, traditional manufacturing principles used a “push” system coupled with large batch sizes which resulted in high inventory levels and long throughput times. The goal in the magnet facility was to increase the capacity and throughput rates, reduce lead-times, and improve quality and efficiency while reducing operating costs. Various simulation classes and training sessions (Value Stream Mapping, Lean 101, 5S/Workplace Organization, Cellular Flow, Quick Changeover) provided the knowledge base to increase “buy-in”, teamwork, throughput, and capacity while reducing lead times, defects, downtime, and operating costs.

Value stream mapping is a tool used to visualize both value added and non-value added actions within a manufacturing process which tracks both information and product flow throughout the system. A current state map is drawn to benchmark the current flow; while a future state map is used to re-design a waste free process and guide the implementation process. At Semicon, this tool was used to analyze the present magnet manufacturing facility, recognize the “muda” (wastes), and build a streamlined flow of the process. Batch sizes were reduced by 35%; individual stations were destroyed and replaced by teams, bottlenecks were replaced with supermarkets, cycle time variability was eliminated with standardized work; non-value added steps were improved with kaizen events; and delinquent orders were improved to 100% on-time with a mixed model system.

A capital investment was made to restructure the factory floor to conform to the flow of the product from raw powder to final product. The idea of cellular manufacturing, or the linking of manual and machine operations into the most efficient combination to maximize value added content while minimizing waste, was used to transform the spaghetti looking flow into continuous flow. Implementation of 5S (Sort, Set in Order, Shine, Standardize, Sustain) allowed for workplace organization by sorting out the unneeded, setting in order the needed, shining, standardizing, and sustaining.

Visual measurements have been placed throughout the facility to keep score of daily on-time delivery, work-in-process, first pass yields, and inventory. Symbols are used to highlight problems to help communicate with other support groups. Team members have been placed on specific kaizen teams to eliminate problems that arise on the measurement board.

Since the implementation first started, on-time delivery has increased to 100%, excess work in process has been eliminated, inventory levels are dependant on demand, and labor capacity has increased.

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