

Lean Initiative Enables U.S. Manufacturer to Stay Competitive, and Stay Onshore

The purpose of this white paper is to share the details and knowledge that engineers at Douglas Electrical have gained over the years regarding the specification and sourcing of hermetic seals and feedthroughs used in space simulation vacuum chamber applications. Having worked with most major space simulation facilities over the years, it is our hope that by sharing these observations, vacuum chamber test engineers both experienced and inexperienced will have an easier time solving the typical problems that can occur in feedthrough applications.

From our experience, there are six major areas of concern that factor into the specification and procurement of hermetic feedthroughs. These include: signal loss; signal density; material selection; the need for highly customized solutions; retrofitting older vacuum chambers; and provisioning for bench testing. As I recently heard while at a NASA facility, in all of these challenges, “The devil is in the details.” Let’s start by looking at some of the “details” and concerns around signal loss.

LEAN INITIATIVE

“When we really sat down and looked at the challenges we faced, we realized a Lean initiative could provide the solution. But we’re a job shop, manufacturing a wide variety of custom-engineered products in runs sizes ranging from a few samples to a few hundred thousand. At Douglas, we do something different every day. We knew Lean worked in large corporations like the automotive industry, but we initially were not sure what the net would be for our type of business,” said Douglas. That’s when Lean consultants PDG Inc. (www.pdgconsultants.com) become involved. “I bid three groups to assist us with our Lean transformation,” said Douglas. “PDG immediately stood out as a great match for our needs, mainly due to the way they indicated they would stay involved throughout the process, working directly on our shop floor.”

“We came in and presented to Douglas in November of 2008,” said John Fischbach, the PDG Lean consultant assigned to lead the Douglas initiative. “They gave us the go ahead within weeks, and we started the program in the late November, early December time frame, just a few months before the downturn really kicked in.”

CONTINUOUS IMPROVEMENT, CELL BY CELL

Like all successful initiatives, the DECo Lean project started with a plan. “We began the DECo project with a comprehensive value stream mapping process, performed in conjunction with Lean team leaders and manufacturing floor personnel. Part of this process let us see where opportunities lay for the biggest gains, observations which helped lead us through our cell by cell Kaizen events.”

These activities resulted in a 12-18 month action plan of continuous process improvement based on developing a deep understanding of performance trends, errors and defects, and developing improvements in the manufacturing process. Each team was encouraged to suggest any changes they thought valid, with no part of any process off limits. The teams were continuously challenged to take a fresh look at each part of their work flow, with the goal of developing tools that could apply to any project that came through the door.

OUT WITH THE OLD, IN WITH THE NEW

In each cell, dramatic improvements and sometimes unanticipated benefits were realized. Tackling the challenges of inventory management, operator motion and re-handling, and batching and standard work process issues in the Switchgear Cell, for example, witnessed over 50% improvement in lead times and productivity, and the number of product touches were reduced by over half. “For this Lean Team, it was a real lesson in discovering the efficiency of One Piece Flow, and the fact that Line Balance really does make the job much easier,” said PDG’s Fischbach.

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HIGH QUALITY, FAST TURNAROUND, COMPETITIVE PRICING - FROM A U.S. MANUFACTURER

Seeing numbers like those cited in the work cells above certainly proves the value of Lean, but what do they bring to the business? For DECo, the efficiency gains translated directly into cost control and competitive positioning. According to Ed Douglas, "I would have to say that we achieved all we set out to do, and more. Our lead times, our product quality, and our pricing are now aligned to maintain our industry leadership position, as well as helping us to remain competitive in the face of increased overseas competition. The ability to continue to offer the known advantages of local engineering, production, and fast lead times all at a competitive price is even more important in the new economy. Our current success is directly linked to the investment we made in our people and our processes." All this during one of the worst economic downturns in U.S. history. For Douglas and PDG, Lean continues to be an American manufacturing success story of which we can all be proud.

SUMMARY

Client: Douglas Electrical Components, Inc

Lean Consultant: PDG Consultants Inc.

Facility Description: 30,000 square foot facility in Randolph, New Jersey, specifically designed to support the new Lean program and the over 85 permanent and contract employees.

Challenges: The primary challenge was to increase production efficiency in order to control product cost, and therefore price in order to remain competitive as a U.S. based manufacturer. Secondary goals included increasing quality and decreasing production lead times.

Response: Lean plan developed with Douglas employees and management, implemented throughout 2009 and 2010.

Results: Efficiency gains of over 50%. Lead times reduced by 50% and more. Labor costs reduced by almost 50%, with the ability to maintain a competitive market position while still providing customers the advantages of U.S.-based engineering, manufacturing and short lead times.