



Case Study: Lean Assembly Process Improves Throughput and Quality

The challenge: This customers' precision components are produced in mid-volume production runs (500 to 2000 parts per run, typically), yet assembled and shipped in small quantities (1 to 100, typically). The assemblies are put together in a variety of configurations and shipped directly to our customers' customers. Demand is highly variable, forecast visibility is zero and lead times are short. Nonetheless, achieving ever shorter lead times and higher levels of quality are mandates While maintaining or even reducing costs.

The solutions: Production management, quality management and line personnel performed a Kaizen Event on the assembly cell. Working with our customer, who provided some valuable suggestions, the team evaluated all aspects of the product assembly process. The result of this Kaizen initiative, the entire assembly process and supporting processes were modified. These changes included:

1. Redefining the assembly processes – Each assembly instruction was re-evaluated, with the intent of simplifying each assembly step and building in inspection steps and responsibilities, where before these were less well defined.
2. The assembly stations were balanced so that each had similar Takt times that allowed for smooth flow of product through the line.
3. Establishing new inventory control procedures – Particularly as related to small items (hardware and hardware kits) and items with similar appearances, the inventory procedures were modified to ensure correct counts, eliminate the potential for mixing similar components, and eliminate the possibility of omitted components. This was done in a number of ways, including:
 - a. Pre-counting hardware and components into “kits” for each work order. If there are any parts short at the end of the run or if there are extra parts leftover at the end of the run, the team must do a 100 percent inspection of the product in the run.
 - b. Only allowing one “kit” of parts and components to be in process at any given time.
 - c. Using precision scales to double check the counts on a “per unit” basis.
4. Cross train assembly personnel, where appropriate to increase the flexibility of the team to quickly change from one assembly to another.
5. Provide enhanced documentation on the assembly line. Hardcopies of assembly instructions have always been available to assembly personnel, but once a team had “learned” how to do a particular assembly, the hardcopy instructions were seldom referred to. Over time, this allowed for drift in the order or structure of the work instruction. The assembly line is now fitted with a series of large monitors, each of which shows a pictorial assembly instruction for each assembly station. As part of the change over from one assembly to another, the team lead will select the new assembly part number from a drop-down and all screens automatically populate with the correct instruction. This process ensures that the assembly is done the same way every time, and that the operators have the correct instruction directly in front of them to refer to.
6. The team is continually improving the processed in the assembly cell. The team meets weekly to review any issues encountered during the previous week and continue to look for ways to refine and error proof the assembly process.

The Results: The early results from this lean project indicate successful decrease in cycle times and a significant decrease in assembly errors (target is zero), while maintaining or decreasing costs.