

Six Sigma and Lean enable vinyl siding manufacturer to make a better run for the money.

This leading, vertically integrated manufacturer and distributor of exterior residential building products wanted to reduce giveaway. The company's core products include vinyl windows, vinyl siding, aluminum and steel siding, and vinyl fencing, decking, and railing. These products are marketed wholesale to thousands of independent contractors through a network of company-owned supply centers and independent distributors across the U.S. and Canada.

The company's new CEO saw an immediate need for improvement at its highest profile operation, which contained 19 vinyl extrusion lines and produced about 2.6 million pounds of vinyl siding per week - or enough to cover 300 medium-sized American homes per day.

"I was very familiar with USC Consulting Group (USCCG) based on work they had previously performed for me at another building products company," said the CEO, "so I knew I could count on them to get the job done."

Based on the strength of that pre-existing relationship, USCCG, an operations management firm specializing in business performance improvement, was brought in to help turn the facility around.

When the consultants arrived on site, scrap was in excess of 25%. The high scrap rate, along with above-industry standards in gauge distribution and PVC and ASA usage, was seriously eroding the profitability of the siding division and clearly needed to be brought under control. But this proved to be no ordinary cost-reduction project. USCCG was also asked to help develop a Manufacturing Operating System to help manage Gauge

Control (the overall depth of a panel of siding), PVC (a special additive required to produce light colors), and ASA (a special additive required to produce dark colors) usage.

The USCCG project team concentrated their efforts on one extrusion line capable of producing vinyl siding at a rate of 500,000 pounds per week. This accounted for almost 15% of the facility's total output. It soon became apparent that this was the perfect line on which to start the crew down the path of



Key Metrics

Overall giveaway was reduced 42%

Scrap due to variation in gauge was reduced 113%

Scrap due to variation in PVC coating was reduced 13%

Scrap due to variation in ASA coating was reduced 18%

operational excellence. Client team members readily expressed their satisfaction at becoming part of the solution instead of the problem. Said the shift leader, “With giveaway and scrap down, customer satisfaction and orders will rise and we’re well positioned to handle them.”

The team utilized a combination Six Sigma and Lean approach that was customized to the needs of the client to address cap stock/gauge thickness, variation, and scrap. Analysis indicated that the variation needed to be reduced first in order to reduce the giveaway of these materials; otherwise, there may be a risk of generating product outside customer specifications. Four continuous improvement (CIP) teams were created with four separate project charters focused on reducing:

1. PVC/ASA cap stock variation and giveaway;
2. gauge variation and thickness;
3. color change scrap (generated when changing from one product to another); and
4. other scrap (all other scrap excluding color change scrap).

A ‘closed loop’ problem solving process was applied to the chosen extrusion line to define specific project goals; perform data analysis; generate solutions; prioritize, plan, and execute solutions; and verify their effectiveness. Some of the tools the CIP teams used were Gage R&R, 5Ss, Attribute Agreement Analysis, Quick Changeover, Cause & Effect, Cause & Effect Matrix, Hypothesis Testing, and Statistical Process Control (SPC).

At the outset, CIP teams established SPC control limits by product family using historical data for cap stock and gauge thickness. Once it was determined via prototyping that the limits were suitable for the process variation, operators, supervisors, process engineers, quality inspectors, and senior staff were trained on SPC, prior to a full-scale deployment.

As the CIP teams deployed the prescribed Six Sigma/Lean approach, high impact solutions to address scrap and giveaway were implemented. These directly helped operators better control the process, and, together with SPC, led to significant reductions in process variation and scrap. As a result, the improvement in variation reduced giveaway by narrowing process thickness targets without imposing any risk to product quality. In addition, the reduction of process variation, in part, helped the CIP teams lower their scrap rate and achieve their targets.



First we make it work. Then we make it last.®

For more information contact us at 800-888-8872 or www.usccg.com

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*- Shift leader,
Extrusion Line, Vinyl
Siding Manufacturer*