WASHINGTON STATE DEPARTMENT OF ECOLOGY

Lean & Environment Case Study:

LASCO® BATHWARE

Executive Summary

Washington State Department of Ecology
Publication Number 07-04-009
Revised April 2008 with updated material

Lean and Environmental Pilot Project
Case Study: Lasco Bathware, 2007

Project Activities Conducted: May 2006 through January 2007

Publication Date: July 2007, Revised April 2008

Project Conducted by:

Washington State Department of Ecology, Hazardous Waste and Toxics Reduction Program (www.ecy.wa.gov/programs/hwtr)

Washington Manufacturing Services (www.wamfg.org)

Pilot Facility Participant:

Lasco Bathware, Yelm, Washington (www.lascobath.com)

Case Study Prepared by:

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Executive Summary

Lean & Environment Case Study: Lasco Bathware

The Washington State Department of Ecology's (Ecology) Hazardous Waste and Toxics Reduction Program and Washington Manufacturing Services (WMS) partnered in a lean and environment pilot project to provide technical assistance to a Lasco Bathware (Lasco) facility in Yelm, Washington. Lasco manufactures fiberglass and acrylic bath and shower fixtures. Ecology provided environmental expertise for this pilot project, while WMS provided lean expertise and management of the on-site activities at the Lasco facility from May 2006 through January 2007. Funding for the pilot project was provided by the National Institute of Standards and Technology and a grant from the U.S. Environmental Protection Agency (EPA). The primary pilot project objectives were to:

- Evaluate the benefits and synergies of deliberately integrating environmental considerations into on-the-ground lean practices.
- Improve product quality, production efficiency, and product flow in specific areas of the Lasco facility.
- Gain experience to offer and promote lean and environment projects to manufacturers statewide.

Project Activities and Results

Pilot project participants formed teams to address three target areas: (1) packaging and shipping, (2) fiberglass-reinforced-plastic (FRP) spray operations, and (3) acrylic vacuum mold changeover. The teams included cross-functional staff from Lasco and Ecology, as well as a WMS facilitator. The team developed current state value stream maps for the FRP and acrylic lines to identify and prioritize lean and environmental improvement opportunities and participated in three kaizen (improvement) events to implement the identified improvement opportunities.

The collective efforts of Lasco Bathware, Ecology, and WMS produced considerable operational, financial, and environmental benefits. Process improvements include reduced production bottlenecks and cleaner and more organized work areas, decreased variability in spray operations, and reduced energy use and FRP wastes. The facility was also able to reassign over 3,500 annual labor hours to other value-added activities. These improvements also positively affected the plant as a whole by improving ergonomics and internal communication and fostering a more proactive stance toward continuous improvement among production staff.

Cost savings for Lasco Bathware totaled approximately $135,200 per year for process changes implemented to date, as shown in Table 1. Lasco expects to save another $60,650 annually for planned process changes that were identified during this project but are not yet complete.

Table ES-1. Annual Cost, Time, Material, and Environmental Savings for Implemented Changes

Reductions	Cost Savings	Time, Material, & Environmental Savings
Labor[1]	$34,540	2,160 hours
Raw Material and Solid Waste[2]	$1,400	29,000 lbs disposal
Energy	$99,300	12,600 MCF natural gas[3]
Total Cost Savings	$ 135,240	

[1] *Labor redirected for other purposes.*

[2] *Estimated potential savings for production of one of Lasco's common models. Based on measurements for one product line, at the production quantity during the kaizen event in 2007.*

[3] *One MCF of natural gas = 1,000 cubic feet.*

Table ES-2. Expected Annual Cost, Time, Material, and Environmental Savings (Activities Pending Implementation as of April 2008)

Reductions	Cost Savings	Time, Material, & Environmental Savings
Raw Material	$ 22,950 $6,480	43,180 pounds raw resin 1,500 rolls of tape
Labor[1]	$29,060	1,650 hours
Disposal	$ 2,160	43,180 pounds of dried resin
Pending Annual Cost Savings Total (Unrealized)	$60,650	

[1] *Labor redirected for other purposes.*

In addition to these quantifiable savings, the pilot project also generated numerous other operational and environmental improvements at the Lasco facility, such as the following highlights.

Workplace Improvements

- Enhanced staff communications and morale.
- Empowered staff to suggest and initiate future process improvements.
- Improved ergonomics in the packaging and vacuum molding processes.

Process and Quality Improvements

- Increased the weight of spray on the product, resulting in a stronger, higher-quality end product.
- Freed staff time to assist with other value-added activities.
- Reduced time spent looking for finished inventory.
- Improved point-of-use storage and layout of the acrylic molding area.
- Improved organization of materials and tools in work areas.
- Increased conveyor speed and reduced the number of defects from packaging processes.

Environmental Improvements

- Increased the transfer efficiency of the FRP resin spray, which reduces overspray waste and may eventually result in less resin usage and fewer air emissions.
- Reduced forklift travel, contributing to reduction of energy and operator time.

Post-Pilot Project Activities

Lasco Bathware successfully sustained the pilot-project results in the year following the pilot project activities. The facility has hired a new plant manager who is well-grounded in lean and six sigma and has helped to expand lean efforts at Lasco. Lasco continues to look for opportunities to quantify waste and identify additional environmental improvements. These collective improvement activities have improved product quality, increased production line speed and uptime, increased available floor space, and led to cost, time, and material and energy savings. Lasco's pilot project experiences and subsequent continuous improvement efforts have been shared with Lasco's other facilities across the country.

Conclusions

The Lasco Bathware pilot project allowed participants to identify and implement opportunities to improve production processes, reduce costs, and decrease environmental impacts. The examination of environmental wastes during lean implementation helped project teams identify opportunities that may otherwise not have been considered in a traditional lean project. WMS and Ecology worked well together to provide lean and pollution prevention technical assistance during the pilot project. Lasco employees were highly engaged, and the efforts of all participants led to positive changes in staff morale and empowered staff to seek continued lean and environmental improvement efforts.

This case study summary was prepared for the Washington State Department of Ecology by the Pacific Northwest Pollution Prevention Resource Center and Ross & Associates Environmental Consulting, Ltd. For more information about this pilot project, please contact Judy Kennedy at jken461@ecy.wa.gov *or 360-407-6385.*