

Award Winning Arecibo Packaging Project Exhibits Sustainability Operational Excellence

Returnable packaging and a revised shipping method result in \$2 million annual savings for Thermo King's Arecibo, PR plant



Reusable plastic bins, totes and pallets at the weld cell in Thermo King's Arecibo plant are contributing to a \$2 million annual savings.

Background and Sustainable Opportunity

In early 2013, Thermo King's Arecibo plant identified an opportunity to streamline part of their packaging process by incorporating returnable packaging. Returnable packaging constitutes replacing disposable packaging, cardboard boxes and wooden pallets with returnable plastics bins, totes and pallets.

In Arecibo, a robotic weld cell utilized 30 individual parts from a supplier located in Saltillo, Mexico. Mapping the material flow through the logistics route revealed that trucks were being loaded and unloaded many times in transit before reaching the plant. As a result of the analysis, the project scope grew to include returnable packaging, new logistics routing, efficient loading of the sea containers and improved material flow within the plant.

The sustainability opportunity extended from fuel and emissions savings to reducing cardboard and wood from landfills.

Processes

Packaging Engineer Barbara Ledbury helped the team identify solutions for the expanded project scope. Analysis of the parts and the weld process helped to define the correct package size and density to a more efficient process for packing the 240 welded frames. The sea containers were loaded in a manner that matched consumption at the plant in Arecibo, thus eliminating the need to warehouse or unload the parts before being presented to the weld cell.

By restacking the packed goods in returnable plastic bins, totes and pallets, the load was reduced from five trucks per 240 finished units, to two. The shipping route was changed to go directly from Mexico to Puerto Rico via a sea route entirely. A loaded sea container is moved from the supplier by rail to a port in Mexico, through United States Customs in Puerto Rico and to the plant without ever being unloaded. The containers are then brought directly to a dock door at Arecibo near the weld cell, and they are unloaded immediately to the spot where they are used.

Results and Benefits

The overall annual cost savings for this project is more than \$2 million, or \$89 per unit. The accomplishments of this project were recognized with an internal President's Award in the 4th Quarter of 2013 in the category of Operational Excellence:

- Improving cubic utilization of packed goods decreased trucks needed and reduced transportation costs, thus decreasing the carbon footprint by eliminating 288 truck and sea container shipments per year.
- Removing the land route and using returnable packaging reduced the number of non-value added touches from 12 to 4.
- Removing the 288 road trips per year, totaled a savings of 403,200 miles and 67,200 gallons of diesel fuel.
- Returnable plastic bins, totes and pallets are leased and returned in Puerto Rico, reducing plant solid waste from eliminating the disposable cardboard and wooden pallets.

Informational Links:

Reusable Packaging Association
reusables.org

Thermo King
thermoking.com

Center for Energy Efficiency and Sustainability
CEES.ingersollrand.com

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