

Abstract

The main goal of this project was to provide Pacific Can with a more cost-effective alternative for drying their cans. We analyzed the current process and conducted experiments to determine the feasibility of our proposed alternatives. Methods used include statistical analysis, time-study, seven-step process improvement, cost-benefit analysis, and simulation. We also took into consideration the potential for expansion of our alternatives to other facilities.

Background

Pacific Can is China's leading 2-piece aluminum can manufacturer for beverage packaging in China. It has had a great deal of success in implementing an active product-development cycle, leading to numerous innovative solutions. However there is still room for improvement, for example implementing an improved drying process that can efficiently remove the residual water from the cans, reduce energy consumption, and save total cost. To do this we researched how the process works and what Pacific Can is willing to change for implementing an improved solution.

Project Goals/Objectives

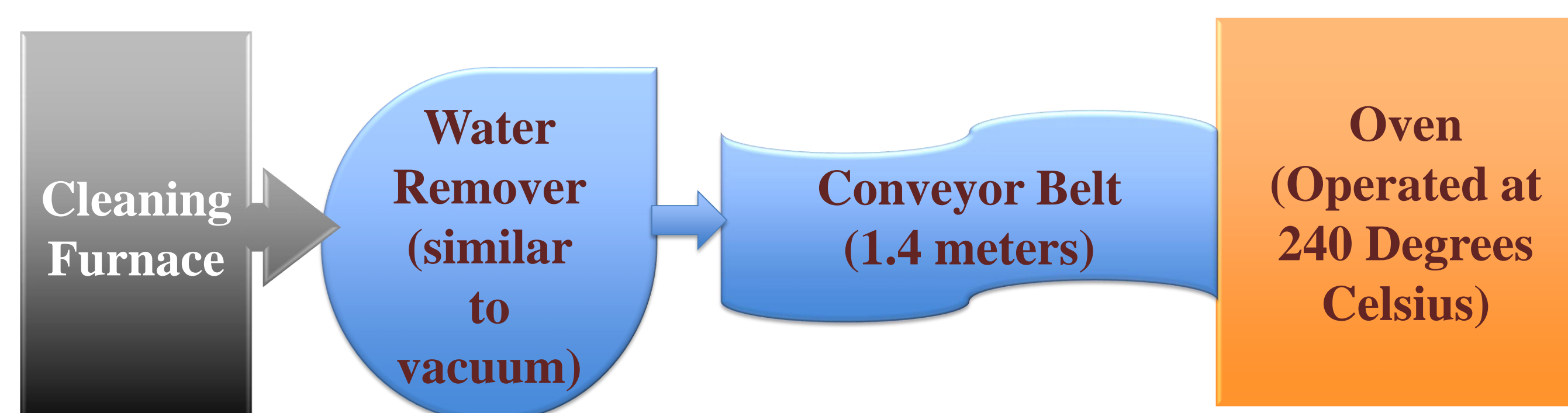
The overall goal of the project being to find the most cost effective, quality solution for Pacific Can to implement in their current process, saving the company both money and energy usage.

Objectives:

- 1: Define – defined the scope of the problem
- 2: Measure – measure the current performance
- 3: Analyze – develop and design alternatives
- 4: Improve – design experiments and collect data
- 5: Control – make recommendations for the company to achieve continuous improvement

Methods/Process

Factors of optimizing the drying process include the cost, energy consumption, and maintenance. While trying to find a viable solution compared to the current drying process, the current production rate should also be considered because Pacific Can would like to maintain the same rate.



Methods used:

- time study
- cost benefit analysis
- smart method
- seven step process improvement
- systems thinking

Once the process was understood, we brainstormed for alternatives and created different tests for each resulting in accurate data presenting the most feasible alternative to recommend to Pacific Can.

Results/Recommendations

Results from experiments suggest a significant energy decrease with the use of infrared lighting as an enhanced drying process. It also brings down the total cost significantly. With a 95% confidence, the residual water is evaporated completely at 40 seconds.

Cost Benefit Analysis:

	Annual Cost	Setup Costs	Energy Use/day	ROI
Current	\$58,333	0	1000 m ³	-
Infrared	\$16,024	\$560	\$21.64 USD	264%
Acetone	-	-	-	-

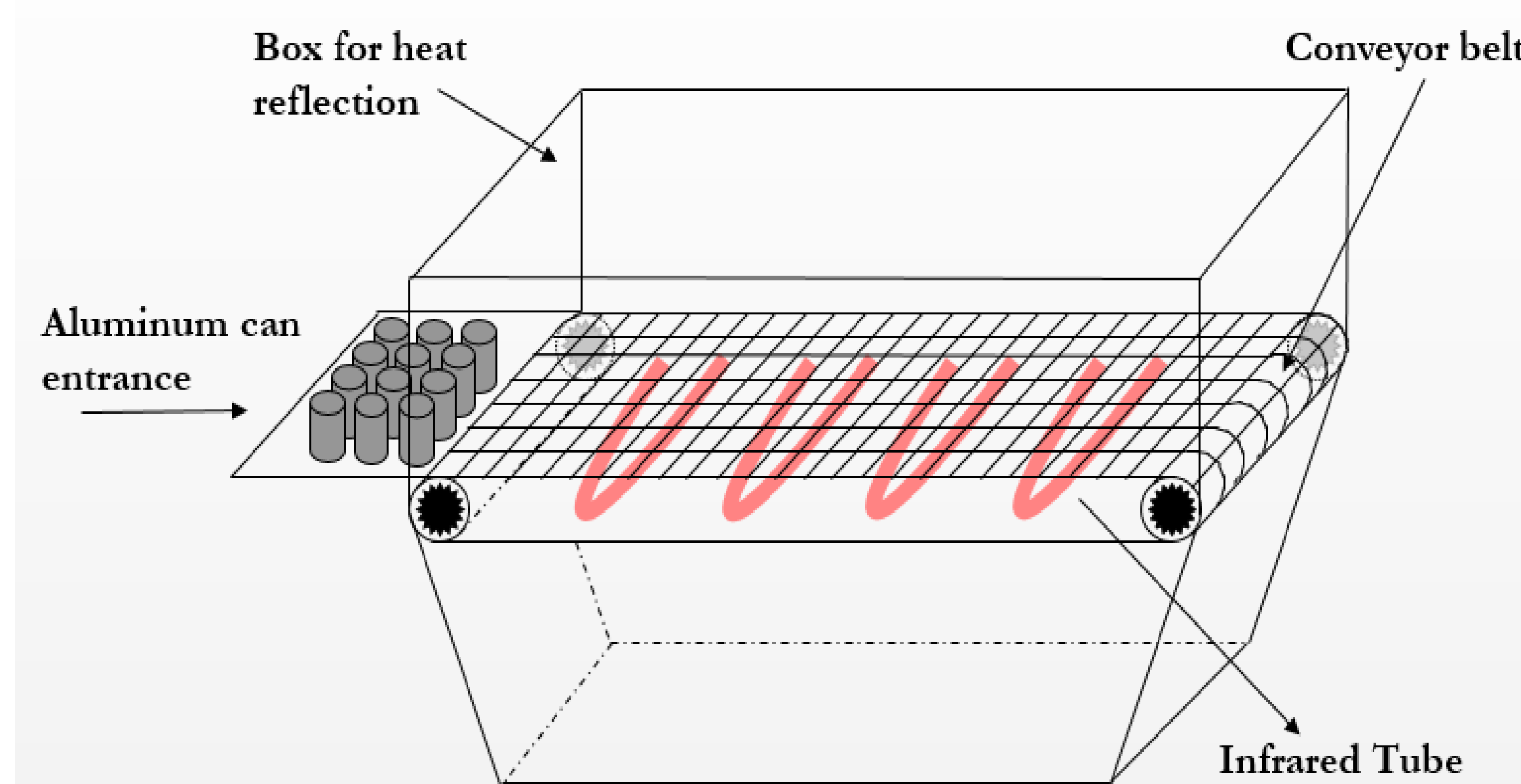
Short-term Recommendations:

- (1) Infrared/Oven Combination with further testing, random sampling with higher quality infrared tubes, and simulation built with assistance from Pacific Can
- (2) Further investigate use of chemical compounds such as acetone or ME-50

Long-term Recommendations:

- (1) Replace current oven with infrared light system
- (2) Use water based compound to help reduce the flashpoint of the residual water

Proposed Design for Infrared Tube System



Acknowledgments

Mr. Glenn YEE, the chairman of Pacific Can
 Mr. Liu, the plant manager of Pacific Can Beijing
 Mr. Tian, Mr. Tan, engineers of Pacific Can Beijing, and Ms. Zhu
 Professors Amy Zeng and Jianyu Liang at WPI
 Professor Dazi Li at Beijing University of Chemical Technology

Major Reference

Pacific Can - Our Businesses, Market and Product. Pacific Can. N.p., n.d. Web. 27 Apr. 2015. Retrieved from <<http://www.pacificcan.com/en/intro.html>>.