Nitrile Glove Recycling Implementation Project

STUDENT SUSTAINABILITY COMMITTEE

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A report by the Illinois Sustainable Technology Center, Zero Waste Program

www.illinois.edu/zerowaste

ILLINOIS SUSTAINABLE TECHNOLOGY CENTER
PRAIRIE RESEARCH INSTITUTE

INTRODUCTION

Illinois Sustainable Technology Center conducted a waste audit of their main building in February 2013. Through the process of the waste audit it was found that single use non-hazardous gloves were 13% of the waste stream.

The Zero Waste Illinois team explored multiple options to reduce and recycle the single use non-hazardous gloves.

Kimberly Clark[1], a company that manufactures nitrile gloves, takes their gloves back to recycle into park benches, bike racks, etc. through their RightCycle[1] program.

ISTC piloted the use of the RightCycle[1] program throughout its labs. After successfully integrating the glove recycling project within their labs, the ISTC's Zero Waste Illinois team explored expanding this program to other departments on campus.

Highlights of the project

- ✓ *Custom built two distinct collection bins for University Housing to test at Ikenberry Dining Hall.*
- ✓ *25 collection bins have been set up at Ikenberry Dining Hall since July of 2014.*
- ✓ *As of November of 2014, close to 900lbs of gloves have been shipped back to the manufacturer.*
- ✓ *Other departments on Campus are in the process of implementation.*
- ✓ *University Housing is exploring expanding the glove program through their operations.*

University Housing showed considerable interest in exploring the glove recycling program for its dining operations. ISTC received a grant from the Student Sustainability Committee of $1940.81 to assist University Housing in implementing their own glove recycling program.

Questions about this report and project may be directed to:

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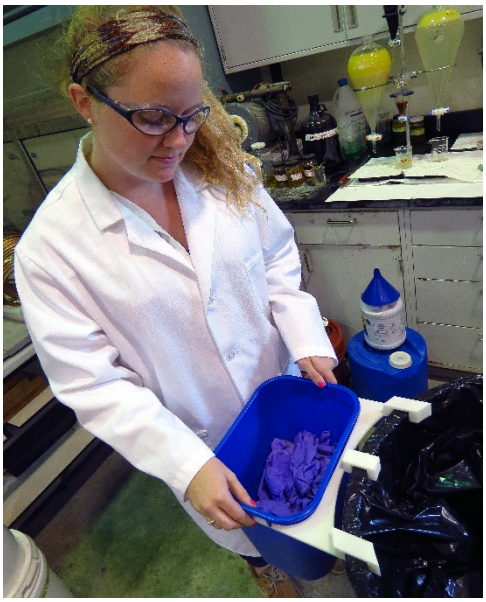
[1] ISTC and the University of Illinois has no affiliation with Kimberly Clark and The RightCycle Program. ISTC, through the use of Kimberly Clark in the Nitrile Glove Program in no way endorses the RightCycle Program. Both Kimberly Clark and RightCycle are trademarks of the Kimberly Clark Corporation.

PROCESS

After several meetings with various stakeholders at dining, collection was deemed to be the critical step in the process. According to dining needs, a bin needed to be designed that would hang off the existing trash bins to dispose of the used nitrile gloves. Two options were presented to the dining hall. One option was created using Inventor, a 3D design program, which hooks onto the large brute and holds the recycling container for the gloves. Figure 1 shows how it works and a picture of the design with dimensions from Inventor. The University is in the process of patenting this design.

Figure 3 Plastic 3D printed Glove Recycling Option Figure 1 Drawing of 3D printed hook



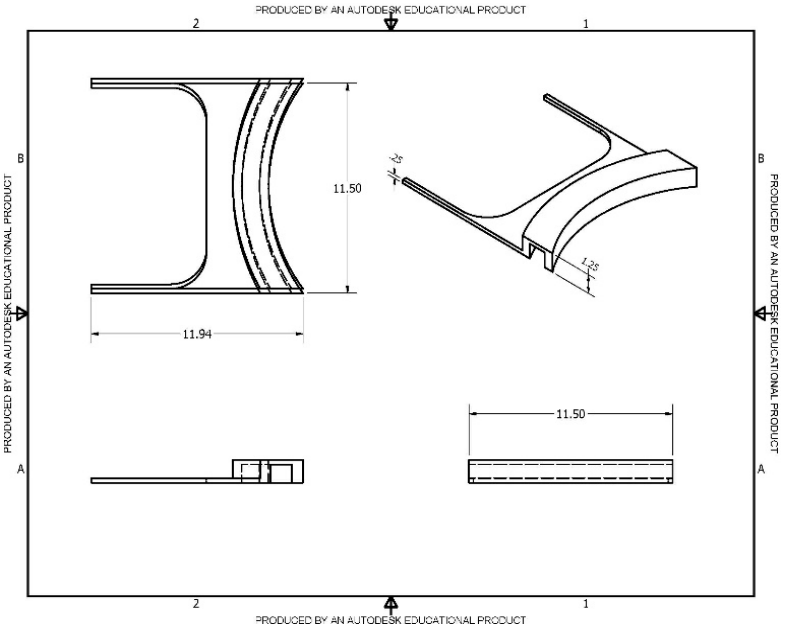


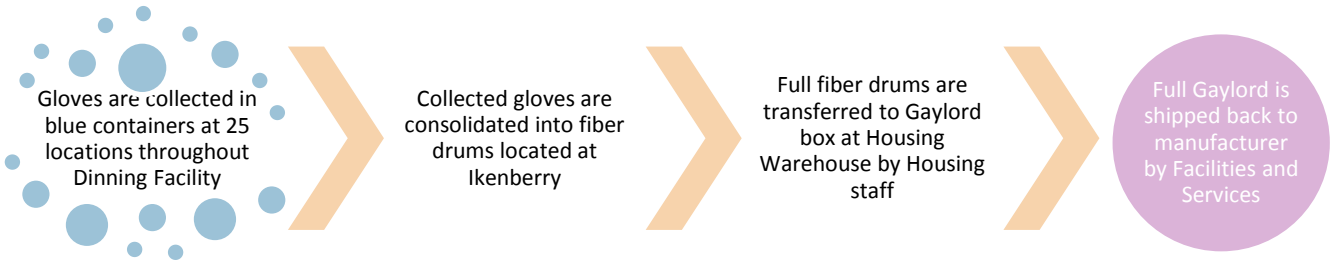
Figure 2 Hook Glove Recycling Option

The piece was made in a 3D modeling lab at the Mechanical Engineering Building on campus. The disadvantage of this option was that it cost $30 per unit. The other option was a bin with two hooks that screwed onto the recycling bins and hung off the brute. Figure 2 shows a picture of the recycling bin being used in the Ikenberry Dining Hall below.

This second option cost approximately $3 per piece. University Housing was given both options to try out for a week to see which bin would work better. Although the plastic piece was more creative and designed by a University of Illinois student, in a University of Illinois lab, it was more expensive to create. Therefore, the dining hall chose to use the hook design.

IMPLEMENTATION

University Housing was given 25 recycling bins with the hook design to start the recycling process. The dining hall staff was educated on the new glove recycling program and encouraged to recycle all their gloves with the easy collection system. Housing started to collect the gloves on July 2nd, 2014. As of November 2014, they have shipped two Gaylord boxes of gloves, accounting to 880 pounds of recycled gloves.



COST ANALYSIS

The two main costs for implementation can be broken up as the capital expense of the bins and then the recurring cost of transportation of the collected gloves.

Capital Costs:

Purchase of one recycling bin: $9.50/bin

Recurring Costs:

The price to recycle one box gloves: $0.06/box[2]

FUTURE

Currently, the program is in the process of being expanded to other buildings on campus which use large amounts of gloves. Through the success at the Ikenberry Dining Hall, University Housing has expressed interest in expanding this program to the rest of the dining operations.

[2] Assumptions:
Box of gloves weighs 0.1323 lbs.
Density of a glove: 0.0026 lb/in3
Dimensions of a standard Gaylord box: 48”x48”x72”
Maximum gloves in a Gaylord without compaction: 0.0026 $lb/in^3 \times 48in \times 48$ in $\times 72in = 439$ lbs
Boxes of gloves per Gaylord: 439 lbs/gaylord ÷ 0.1323 lbs/box=3319 boxes per Gaylord
Cost of shipment and handling: $215/shipment