



Executing a Circular Economy Model and Sustainable Practices in Medical Device Manufacturing

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INTRODUCTION

What is a circular economy¹?



CMM=Circular Materials Management

Medical device manufacturing contributes 80% of emissions from health care²

Philips sustainability platform includes:

- documentation of circular materials management
- conducting audits to improve on their resource use



Before Salvaging



After Salvaging



Figure 7. Philips Laser System (PLS) prior returned to the site and open audit for salvaging and recycling. Image taken by Julia Valdez, Senior EH&S Engineer/Philips

Case Study #1: CMM Report for Reusable Shipping Crates

Results: **46,596 lbs. of waste used circularly per year**

Figures 2.1 and 2.2 below depict the previous materials management method and the current circular materials management method used for the shipping crates.



Figure 2.1 Previous Materials Management Method (linear) used prior to circular implementation and prior completion of the audit. The audit for this site was completed by the previous site and prior to the audit. The audit for this site was completed by the previous site and prior to the audit. The audit for this site was completed by the previous site and prior to the audit.



Figure 2.2 Current Materials Management Method (circular) used after implementation and within completion of the audit. The audit for this site was completed by the previous site and prior to the audit. The audit for this site was completed by the previous site and prior to the audit. The audit for this site was completed by the previous site and prior to the audit.

Case Study #2: CMM Report for Salvaging Parts from Laser Catheter Systems

- Results: -A single Gen 4.0 system: ~ **536 lbs.** recyclable material, **134 lbs.** salvageable material
- A single CVX-300 system: ~ **469 lbs.** recyclable material, **201 lbs.** salvageable material
- In the past year:
 - Gen 4.0: ~ **33,232 lbs.** recycled; **8,308 lbs.** salvaged
 - CVX-300: ~ **29,078 lbs.** recycled; **12,462 lbs.** salvaged

Estimated Lbs. of material salvaged and recycled per device	
Gen 4.0	CVX-300
Estimated that 80% is recycled, 20% is salvaged	Estimated that 70% is recycled, 30% is salvaged
670 x .8=536 lbs. recycled per device	670 x .7=469 lbs. recycled per device
670 x .2=134 lbs. salvaged per device	670 x .3=201 lbs. salvaged per device

Figure 3. Estimated material salvaged and recycled per device. The weight of a single device is 1,000 lbs. and the estimated percentage of the total for the device is shown.

Case Study #3: On-site Waste Audit

- Results: -Largest significant waste stream was **general trash**, constituting **17%**
- Second largest waste stream was **thin/soft plastics**, constituting **15%**
- Other significant materials include sanding disks with plastic backings, label backings and isopropyl alcohol wipes, which constituted 4%, 5% and 8% respectively (Figure 5)

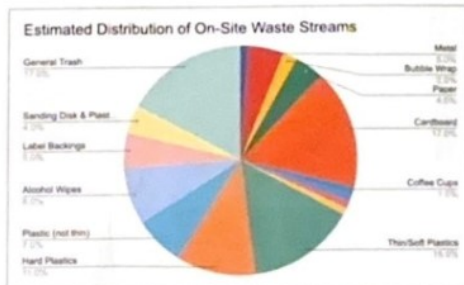


Figure 5. This figure shows the general composition of on-site waste. This represents the overall composition of waste for multiple sites of the previous site was completed by the previous site and prior to the audit. The audit for this site was completed by the previous site and prior to the audit.

METHODS

- Gathered information and calculated the amount of materials used in a circular manner, specifically wooden shipping crates and parts salvaged from laser catheter systems
- Conducted audit and analysis of on-site waste

CONCLUSIONS

- CMM Reports provide a quantitative measure of the impact a circular economy model has on the amount of waste reduced
- There are also significant financial benefits associated with the circular economy model
 - Reusing wooden shipping crates results in a financial savings of \$3,600

ACKNOWLEDGEMENTS

I would like to acknowledge Julian Valdez for assisting me in gathering data and information.

I would also like to acknowledge Professor Megumi Naoi on her input in determining the focus of my research project and the various discussions that could arise from research.

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