

Device for Emergency Water (D.E.W.)

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Problem and Clinical Need

- Consumption of unclean water is a direct threat to public health in areas with poor infrastructure
- Can cause dehydration, fever, and muscle aches, and death
- Approximately 3.4 million people die each year from a water related disease, and 780 million people worldwide lack access to clean water[1]
- Need a solution that provides safe, accessible drinking water for disaster relief and low-resource areas
- We intend to provide short-term clean water at a lower cost than current industrial products and offer a large-scale deployable solution

Innovation behind D.E.W.

- New filter paper called p[Ag]
- Embedded with silver nanoparticles
- Novel in its ease of use and low-cost production
- Eliminates both suspended particles and harmful microorganisms from contaminated water
- Easier to transport, distribute, and use in comparison to other current water purification techniques

Usability

Extensive usability studies were conducted during initial prototyping stages and for the final prototype:

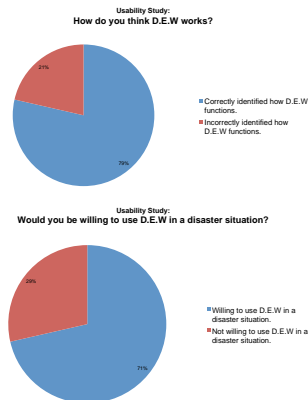


Figure 1: Results of usability studies after interviewing 14 individuals using the most recent iteration of the prototype

Description of Design

Our design is a uniquely shaped plastic bag with an incorporated filter and drinking straw. The device is used when the only sources of drinking water are biologically or physically contaminated.

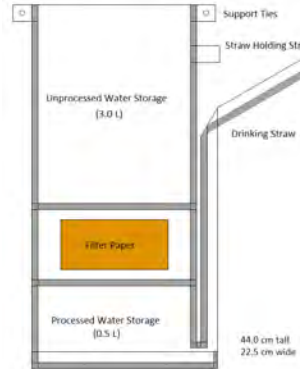


Figure 2: Proposed final design with all the parts of the prototype labeled

How to Use DEW

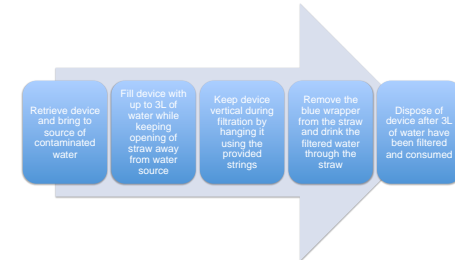


Figure 4: How a user would use D.E.W. in a disaster situation

Estimation of Product Costs

Our product is expected to cost less than \$2.10 per device. Below is a breakdown of our anticipated costs per unit when manufacturing in batches of 10,000 units.

| | |
|--|---------------|
| Total Material and Labor Cost | \$1.05 |
| 5% Error + Quality Assurance Costs (5%) | \$0.11 |
| Overhead Cost (\$20 per direct labor hour) | \$0.94 |
| Total Cost | \$2.10 |

Table 1: Estimated cost breakdown

Assuming similar manufacturing techniques of our prototype manufacturing, the total manual and labor cost includes:

- Manual heat welding
- Using adhesive to bond filter to plastic

Costs are and can be further reduced from:

- Using existing and/or non-specialized machinery
- Automating welding process
- Eliminating adhesive and use an overmolding process

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Current Options

PUR Packets by Proctor & Gamble

- In use in low-resource environments.
- Each packet can purify up to 10 liters of water
- Requires multiple steps, specified waiting times, and equipment

References

[1] http://www.who.int/water_sanitation_health/diseases/en/