Abstract

Project Title: Filtere - Filtering water using a variety of efficient filtration methods

Project ID: = 724

Introduction

This project is about the design of a low cost water filtration system. I did this project because I realized how many people died or got sick from drinking unhealthy and contaminated water. When I thought about this, I took to mind how many people I could impact using one simple invention. Filtere is important to people who do not have access to clean drinking water because clean water is essential to human life. A very essential component is that Filtere can be used on **any** type of container of water because of the places I decided to put the technology I used in. Filtere can impact **2 billion** people because of the potential of it!

Problem Statement and Engineering Goal

The problem I solved was the lack of clean drinking water. This is a major world problem that needs to have a solution quickly or the result will be catastrophic. My goal was to engineer an advanced water filter that could remove all bacteria and germs in water. This filter would have to be simple, so that anyone would know how to use it. I knew that the process of making this device would be complex, but I took on the challenge.

Procedures

I solved my problem of making contaminated water drinkable by creating my portable, interchangeable, affordable water filter. I also kept in mind that the filters would have to be small but effective so that they could fit and also, filter water completely. My design criteria for my project was that it had to remove 95% to 100% of bacteria and other harmful particles in water, it had to be small and portable, it had to be $10.00 to $20.00 so that it would be affordable to people in developing countries, it had to be portable and small, it had to be watertight so that water wouldn't get to the electronics, it had to be reusable, and the filters had to be waterproof.

Results

The outcome of my research and prototype ideas was two designs. I made one first and saw some mistakes which is why I made a different design. The major difference between the two designs is in the number of filters. The first prototype had one UV light filter. My second and current prototype has three filters. GAC (Granular Activated Carbon), Ion Exchange, and UV light. Now Filtere can remove much more germs and particles. Filtere removes 100% of germs, particles, cyths, and other dangerous components in water which exceeds my design criteria. Compared to Brita (a major water filtration company) Filtere removes 32 out of 32 bacteria types from water and Brita removes 2 out of 32 bacteria types from water using their bottle filter. This information is referred from the Brita website.

Conclusion

My goal of engineering an advanced water filter that could remove all bacteria and germs in water was complete. I reached my goal but the process had taken a long time. I learned many things about the engineering design process. During the time of my designing, I used a process that consisted of the steps to ask, imagine, plan, create, experiment, and improve. I repeated these steps and made what I now call ***Filtere*** an advanced, interchangeable, and portable water filter.