

**Mechanical/Environmental Sustainability Project****Ice and Hot Water****Mission Statement**

The mission is to build a unit which creates ice and hot water without the use of electricity or fossil fuels, thereby providing an alternative source of energy to people around the world, especially to those in under-developed regions.

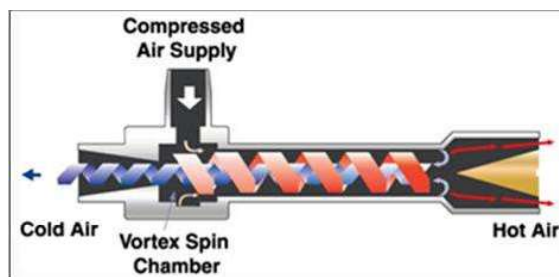
Synopsis

Research and experimentation was done to determine the suitability of a vortex tube for the production of ice and hot water. Compressed air and crude prototypes were used for experimentation. Experimental data revealed rapid temperature changes and vast temperature separation between the hot and cold ends of the vortex tube. Successful results were achieved in production of ice and melting wax (theoretical proof of phase change of water). Research established the best alternative energy sources for powering the unit, as well as other pertinent background information on vortex tube theory and marketability of the product.

The presentation prototype consisted of two cylindrical Plexiglas chambers with coiled copper tubing. Energy supplied by the vortex tube is conducted through the copper tubing to the interior of the chambers where ice or steam is formed.

There were six phases in this project as follows:

1. Research.
2. Determining and obtaining appropriate supplies and equipment.
3. Experimentation.
4. Creation of a virtual prototype using SolidWorks software.
5. Manufacturing of prototype.
6. Creation of an ideal prototype using SolidWorks software.



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