

Innovation Park Water

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Objectives: Test the device.

Materials and Methods

Progress:

Over the past couple weeks, testing of the chambers began. As a precautionary step, more putty was put over some of the creases on the inside of the first chamber to act as a stronger sealant. The first chamber was tested, however, after leaving the heater to run for approximately an hour, the chamber began to smell of epoxy. In concern for the structure of the chamber, the heater was turned off and the device was allowed to cool. The original plan was to reseal all the creases with the epoxy, but after letting the chamber set for a couple days, the epoxy putty began to harden in undesired ways. After further examination, no harm was done to the sealant, so the plan to line the inside with epoxy putty was executed. A video of the first chamber can be viewed on the project website on the Videos page under Media. During testing, water vapor was passing through the condenser coil at an insufficient rate.

Water vapor was visible from the top of the first chamber but not enough was escaping into the second chamber; instead the water had enough time to evaporate, rise to the top, and slowly condense as it found no outlet to escape from. Once the lid of the first chamber was opened, so much water vapor escaped that it was still coming out after 3 minutes. This means that the first chamber is working correctly, but the transfer from the first to the second chamber is not working. To fix this, the coil opening will be pushed back in the second chamber so that when the water vapor is rising and expanding to the sides of the chamber, it will be more likely to travel into the hole instead of move around it. Epoxy putty will also be put around the opening to the coil to prevent water vapor from slipping into the second chamber frame and then escaping past the opening. To push the water vapor down and force it to the opening more, the top will be lowered so that the water vapor has less room to expand and condense.

Work planned over the next two weeks:

Within the next two weeks, more testing of the device will occur, as well as necessary changes to make the device more efficient and functionally sound. The website will continue to be updated, and once both chambers work separately and together, salt water will be placed in the water purifier and then the TDS water purity tester will test how successful the purifier is.

Data and Results

To see qualitative data that the first chamber works, please see the video page under the media tab on the project website.

When the first chamber was tested, the initial temperature of the water was 34.5 degrees Celsius. After 12 minutes and 43 seconds of the water heater heating the water, the temperature raised to 52.1 degrees Celsius. Following that trend, the water would heat to boiling temperature within the hour, but this has not been tested yet because the inside of the chamber needs to be resealed with putty, as mentioned in methods. Figure one shows the water on the heater after the first minute and a half of run time.



Figure 1: This shows the water heater after one minute of operation. The bubbles on the heater show that the water is heating, not reaching a boiling point yet, but close none the less.

References

No references at this time.