

A STUDY ON WATER BULB-USED AS A DAY TIME LIGHT

^[1]DR.N.PANNIRSELVAM, ^[2]DR. K.CHANDRAMOULI, ^[3]DR.D.VIJAYA KUMAR,
^[4]SAGAR REDDY AVUTHUV & ^[5]ANITHA

^[1]Associate Professor, Department of Civil Engineering, SRM Institute of Science & Technology,
Kattankulathur, Chennai, INDIA

^[2]Professor & HOD, Department of Civil Engineering, NRI Institute of Technology, Visadala (V), Medikonduru
(M), Guntur, Andhra Pradesh, INDIA

^[3]Principal & Professor, Department of Civil Engineering, Kodada Institute of Technology & Science for
Women, Kodada, Andhra Pradesh, INDIA

^[4]Post Graduate student, Guntur, Andhra Pradesh, INDIA

^[5]Asst. Professor, Department of Civil Engineering, NRI Institute of Technology, Visadala(V), Medikonduru
(M), Guntur, Andhra Pradesh, INDIA

ABSTRACT

Electricity is a worldwide known source of made light. Electricity is a form of energy that is produced by the movement of electrons. Another way of receiving electricity would be solar electricity. Only recently, in the last two decades, have many people taken advantage of the sun's light and energy to build or install solar products. Solar products are more beneficial to the earth and can save you money in the long run. Solar products include a variety of options like solar panels, photovoltaic systems, solar water heaters, etc. In Manila, Philippines, electricity and solar was both put to use in making a solar bottle bulb. These solar bottle bulbs are starting to become a popular installation. Since the houses in places in the Philippines are located so close together, "they have no windows or natural light." To figure out if a solar bottle bulb was brighter than a regular light bulb when the sun is out. Our hypothesis, to build a solar bottle bulb and compare the brightness to a regular bulb, then the solar bottle bulb will be brighter at times when the sun is out because the sun is brighter than a regular light bulb, in the end was proven. The bottle bulb was brighter and shined more luminously compared to the regular which was dimmer during the brighter times of the day. To perform this into the practical several materials such as water/soda bottle, 1'x1' roof sheet material, purified water, chlorine/bleach and rubber sealant. Recycled water bottles are used to build a solar. Then at the different times of day- turn on regular bulb and compared the brightness to the solar bottle bulb. The data's were observed and compared with the results. Finally, concluded with the data and verified results

with hypothesis. Branching off this project in the future by the comparing its brightness and its effect on different colors of rooms.

Key words: Solar bottle bulb, Solar electricity, Water bulb.

PURPOSE:

To build a solar bottle bulb and compare the brightness to a regular light bulb at different times of day. Our problem is that the solar bottle bulbs are brighter than regular light bulbs when the sun is out. Our hypothesis is... if we build a solar bottle bulb and compare the brightness to a regular bulb, then the solar bottle bulb will be brighter at times when the sun is out because the sun is brighter than a regular light bulb (Fig.1).

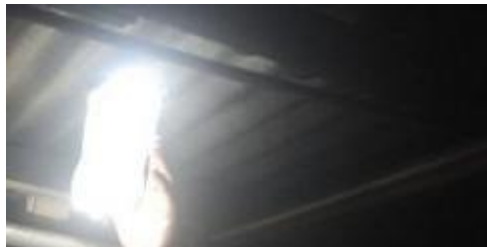


Fig. 1 Solar bottle bulb

HOW IT WORKS?

Sunrays are spread over the universe everywhere. So, solar bulb installation is very easy and it requires one solution at low cost. Fill one liter bottle with prepared solution and install it on the roof of houses or slums or industries. When the sunrays fall on the bottle, it will automatically glow and generate 40-60 Watt electricity and it will last long for maximum 5 years.

EXPERIMENT

The materials used to make the solar bulb were a water bottle of 1'×1' roof sheet material, purified water, a bottle cap filled with bleach and rubber sealant. Some extra materials used were a circular saw, hacksaw and a working light bulb.

PROCEDURE

In order to do the experiment and to build the solar bottle bulb. First, to collect the materials and make a hole in the 1'×1' roof sheet material, just the same size of the bottle's circumference and insert the bottom part of the bottle

leaving it exposed under the sunlight. Second, take small strips that will be bent upwards steel sheet. Third, with a steel brush or sand paper, scratch the surface of the bottle to allow the glue to stick better. Fourth, apply rubber sealant to the small perpendicular strips. Fifth, glue the upper one-third of the bottle to the steel sheet.

The next half would be the components and finishing of the construction. First, fill the water/soda bottle with purified water, but do not use tap water because this will allow the growth of moss. Second, add 3 tablespoons of liquid bleach and tightly seal the cap. Third, make another hole on the roof of the house, same as the bottle's circu-



Fig.2 Installation of Solar Bottle Bulb

mference, where you want to install the solar bulb and firmly fix the device. Fourth, place the bottle with the skirt glued firmly in place directly on the original roof. Fifth, seal the roof with a sealant to prevent raindrops from getting inside the house. Lastly, protect bottle cap from cracking by sun with a protective plastic tube, and apply rubber sealant over the cap and protective cover (Fig.2).

After building the solar bottle bulb, we need to conduct our experiment and start comparing results. First, at the different times of day-turn on the regular bulb. Second, take down observations for data. Third, compare the data for results. Lastly, verify results with hypothesis.

DISCUSSION

In result, the bottle bulb was brighter and shined more luminously compared to the regular bulb which was dimmer during the brighter times of the day. Our hypothesis was proven and concluded that both the solar bottle bulb and the regular light bulb played a brighter role but were dependent on many factors. The regular light bulb was brighter at most parts of the day but while the sun was out, the bottle bulb shined a bright light. By conducting this

experiment, the sun illuminates really bright and useful light, which can save a lot of money and electricity. The disadvantage is if it rains, if the clouds block the sun, or if the sun is only out for a short portion of the day.

ADVANTAGES

- This innovation provides free energy without carbon emissions and is environmentally friendly.
- The carbon footprint of manufacturing one incandescent bulb is 0.45kg CO₂. A 50 watt light bulb running for 14 hours during the daytime has a yearly carbon footprint of 200kg CO₂. Moreover, approximately 90 percent of the power consumed by an incandescent bulb is emitted as heat rather than visible light. As per calculations, 15000 water bulbs at 200kgs will reduce pollution at 3 million kgs for a year of use
- It helps the poor people throughout the world.
- It protects the Environment.

CONCLUSION

The engineering goal was achieved and a new design was constructed that further reflects ambient sunlight. There were no predictions or hypotheses for which design would generate the most light. Because of the construction of an improved design, it is possible that households in developing countries will be using this design instead of the soda bottle solar light that is currently being used. This can reduce 50% of the day time power consumption in rural and urban areas.

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