

Chatchawan Phanthangkul 2013: Design of a Dew Collection System for Roof Garden Irrigation. Master of Architecture (Building Innovation), Major Field: Building Innovation, Department of Building Technology. Thesis Advisor: Associate Professor Pasinee Sunakorn, M.Arch, 142 pages.

In Thailand, the relative humidity is in the range of 30% to 100% for entire of the year. Therefore, the idea of capturing water from vapor condensation for roof garden irrigation purpose is applicable. In this research, the experiment covers the design of material surface in order to collect the dew for watering the roof garden. By using Aluminum Anodize plate, this material was tested the property for vapor condensation because Aluminum Anodize plate has the exothermic coefficient at 0.84. This material, Aluminum Anodize plate, has higher exothermic level than other materials being available in the market which it is suitable for experiment. The height from the ground of this material and the direction of the material in both horizontal and vertical are variable for investigating amount of vapor condensation.

According to preliminary result from the research, the test of Aluminum Anodize plate with size of 0.5 x 0.5 meter and 0.01 meter thickness horizontally installed at the height of 0.5 meter from the grass generates the dew of 50 cc per night (equivalent to 200 cc per square meter). Meanwhile, the test of Aluminum Anodize plate with size of 0.5 x 0.5 meter and 0.01 meter thickness installed vertically on the ground generates the dew of 15 cc per night (equivalent to 60 cc per square meter). The temperature of the surface showed that the plate installed on the vertical direction has less endothermic reaction in daytime than the one put on the horizontal direction. However, if the plate is put on horizontal direction, it will receive more endothermic reaction than vertical one on daytime. At nighttime, the plate will also have more exothermic reaction than vertical plate.

According to the experiment, the design of using two different installations will be adapted in the next stage. The Aluminum Anodize plate is put on vertical direction on daytime in order to reduce the temperature on the material surface and it will be rotated to horizontal direction on nighttime. The test of Aluminum Anodize plate generates the dew of 60 cc per night (equivalent to 240 cc per square meter). Therefore, to put the plate on vertical direction on daytime and change to horizontal direction at nighttime lower the material temperature in the evening. It also creates faster exothermic reaction from the material at nighttime and reduces the temperature to dew point quicker.

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Thesis Advisor's signature