

Design and Development of a Portable Thermo-Electric Cooler Bottle

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Abstract: *There are several traditional refrigeration systems as we all know. This has resulted in serious issues with the usage and disposal of CFCs and HFCs, as well as the fact that they are not portable. As a result, an electronic device is required to maintain the inside temperature while also lowering the temperature to cool water and preserve perishable liquids. When compared to conventional cooling systems, a Peltier Effect water-cooling system has numerous advantages, including being tiny, portable, noiseless, environmentally benign, and cost-effective. The current study examines the performance characteristics of thermoelectric refrigerators in various scenarios. The hot side temperature rises when the applied voltage is raised, whereas the cold side temperature decreases. The heat absorbed by the cold side and the heat rejected by the hot side both increase as the applied voltage increases, but the "coefficient of performance" drops. Raising the heat sink fan speed improved system performance by increasing the amount of heat absorbed by the cold side and rejected by the hot side. The performance of the TE water cooling system is heavily influenced by the "initial water temperature". As a result, compared to traditional refrigeration with the same refrigerating effect, there will be less power usage and completely eco-friendly refrigeration.*

Keywords: Peltier Effect, Heat Sink, Coefficient of performance, Thermoelectric

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