

# Innovative thermal storage-based cooling system for battery charger of electric vehicles

**Status:** Available

**Group Members:**

**Sponsor(s):**

**Supervisor(s):** Dr. Majid Bahrami, PhD, P. Eng., Professor, Mechatronic Systems Engineering

## Project Description

Battery chargers are used in applications such as electric and plug-in hybrid vehicles, forklifts, hand lifts, and golf cars. Delta –Q Technologies is a pioneer in battery charger technology and have been delivering to customers such as floor care machines, power sports and transport sector. Operating constantly under full loads, there needs to be efficient (and green) heat sink designs to dissipate the heat produced by the chargers, to which the company is continuously thriving towards. Integrating a heat storage-based cooling technology is a futuristic approach to store large amounts of heat and help in peak shaving the operating load on the charger. The main objective is to use naturally-cooled heat sink that do not fan for cooling thus no parasitic power is required. Naturally-cooled heat sinks are desired since they are green (no parasitic power required), noiseless (no fan), and reliable (no fan failure). Innovative heat sink designs shall be developed to have a significant footprint of fins to dissipate heat to the environment and have space for the energy storage materials. In order to achieve this objective, engineering work is required to develop such hybrid heat sink prototypes. There are enough proof-of-concepts developed in Dr. Bahrami's lab for the use of phase change materials (PCM) such as paraffin to store heat during their phase change to assist with heat sinks of battery chargers. Such materials

- General knowledge of MATLAB
- General knowledge of LabVIEW
- Ability to establish and work with the industrial partner

Asset:

- Machine shop skills/experience