

EV Battery Cooling using PCM and Force Convention Method

Nilesh Misal¹, Vishal Patil², Nikhil Kale³, Pawan Shid⁴, Dr. Nilesh Jawarkar⁵

Student, Department of Mechanical Engineering¹²³⁴

Professor, Department of Mechanical Engineering⁵

JSPM Rajarshi Shahu College of Engineering, Tathawade, Pune, Maharashtra, India

Abstract: The thermal battery management system (BTMS)'s goal is to preserve the health and effectiveness of the battery. as well as ensure that the temperature of the battery inside is in safe operating range. a conventional air cooling system not only does it need extra power, but it also can't meet. The demand for new lithium-ion battery (LIB) packs is high energy density, while liquid cooling requires BTMS complex devices to ensure the effect. Therefore, Phase change materials (PCMs) based on BTMS technology are now becoming commonplace. Using PCM s to Absorb heat, the temperature of the battery pack can be maintained Within the normal operating range for a long time without using any external force. It was an experimental platform developed to study thermal phenomena in a Li-ion battery With PCM material. CFD analysis will be performed to find out Battery EV temperature and PCM while operating state.

Keywords: Battery, PCM, Temperature, CFD

REFERENCES

- [1] Review on thermal management systems using phase change materials for electronic components, Li-ion batteries and photovoltaic modules by Ziye Ling a , Zhengguo Zhang a,n , Guoquan Shi a , Xiaoming Fang a , Lei Wang a , Xuenong Gao a , Yutang Fang a , Tao Xu a , Shuangfeng Wang a , Xiaohong Liu
- [2] A Study on the Application of Phase Change Material for Electric Vehicle Battery Thermal Management System using Dymola by Chulyoung Choi. Woongchul Choi
- [3] Active cooling based battery thermal management using composite phase change materials by Yangi Zhao, Boyang Zou, Chuan Li, Yulong Ding
- [4] Experimental study of a passive thermal management system for three types of battery using copper foam saturated with phase change materials by Ziyuan Wang,a Xinxu Li, *a Guoqing Zhang,a Youfu Lv,a Jieshan He,a Jinghai Luo,a Chengzhao Yangb and Chuxiong Yang
- [5] Lithium-ion Battery Thermal Management System Using Phase Change Material by E Grimonial , M R C Andhika, M F N Aulady2 , R V C Rubi3 , N L Hamidah
- [6] Materials with phase change characteristics are used in battery thermal management systems. : A Review by Changcheng Liu 1 , Dengji Xu 2 , Jingwen Weng 3 , Shujia Zhou 1 , Wenjuan Li 1 , Yongqing Wan 1 , Shuaijun Jiang 1, Dechuang Zhou 3,* , Jian Wang 3,* and Que Huang
- [7] Utilising forced convection and composite phase change materials, hybrid cooling is used for battery temperature control.by Mohamed Moussa EL IDI a,b,* , Mustapha KARKRI a , Mahamadou ABDOU TANKARI a , St'ephane VINCENT
- [8] Phase change materials are used in computational modelling of the battery thermal energy management system.by Pusapati Laxmi Narasimha Raju , Chalumuru Manas, and Harish Rajan
- [9] The evaluation of the battery thermal management system using composite phase-change materials in conjunction with air cooling and fins by Qingkai Gu, Guijing Li