

High Power and High Energy Li-ion Battery Technology (HPHELBT)

1. Introduction:

Naval Science and Technological Laboratory (NSTL), Visakhapatnam, a Research & Development Laboratory under DRDO, MoD has developed High Power and High Energy Li-ion Battery Technology and holds the know-how of various technologies related to the development. NSTL, Visakhapatnam invites Expression of Interest (EOI) from enthusiastic Indian manufacturers who have willingness to absorb the technology and undertake production of Lithium ion (Li-ion) battery systems based on **High Power and High Energy Li-ion Battery Technology (HPHELBT)** for Civilian Applications developed at NSTL, Visakhapatnam.

2. System Description:

While the term “Li-ion battery” is often used, it consists of Li-ion cells and Battery Managements System (BMS). The “cell” is the basic electrochemical unit providing a source of electrical energy by direct conversion of chemical energy and consists of an assembly of cathodes, anodes, separators, electrolyte, container and terminals. BMS is the electronic monitoring and controlling system to maintain the performance of the Li-ion cells.

Know-how of the high power and high energy Li-ion battery technology is established by NSTL indigenously. The high power and high energy Li-ion cells in prismatic configuration are not readily available commercially. Synthesis procedures for high power and high energy cathode materials are established in-house. All processes are optimized for high power and high energy Li-ion cell fabrication in both pouch and prismatic configurations. Li-ion cells of 60 Ah capacity are fabricated, tested and evaluated. To confirm their safe operation in civilian applications, environmental and abuse tests are carried out.

3. Salient features of the HPHELBT are as follows:

- a. Design of compositions and Liquid to Solid ratios for fabrication of Li-ion cells
- b. Optimized procedures for fabrication of Li-ion pouch and prismatic cells
- c. Optimized procedures for electrochemical characterization of the fabricated cells.
- d. Synthesis of carbon coated LFP cathode material & variants for flat operating voltage.
- e. Synthesis of LMO cathode material & variants (LNMO) for high voltage operation.
- f. Fabrication of Li-ion cells in pouch and prismatic configuration based upon the above cathodes and MCMB anode.
- g. Drawings of components of cells
- h. Design documents and ATPs