

F. No. 01(02)/2022-AEI (20555)
Government of India
Ministry of Heavy Industries
(AEI Section)

Udyog Bhawan, New Delhi
Dated the 2nd November, 2022

Office Memorandum

Subject: Testing parameters to enhance Human Safety of Electric Vehicles incentivised under (i) Production Linked Incentive (PLI) scheme for Automobiles and auto components (ii) PLI scheme for Advance Chemistry Cell (ACC) and (iii) FAME II scheme of Ministry of Heavy Industries (MHI).

To safeguard Human Safety, certain tests which are done internationally will be made mandatory from 1st April 2023 for claiming incentives/payouts under the PLI schemes for Automobile and Auto components, ACC and FAME II scheme being implemented by MHI.

2. It is reiterated that these tests enhance Human Safety by ensuring quality at the 3 levels i.e. (i) Battery Pack (ii) Battery Management System (BMS) and (iii) Cell level. The details of the tests are **Annexed**.
3. These tests are widely carried out and accepted internationally for safeguarding Human Safety and thus would be made mandatory for the above referred schemes of MHI w.e.f. 1st April 2023 as a precondition for claiming incentives.
4. If any of these tests fall under CMVR guidelines having implementation timelines before 1st April 2023 then CMVR timelines will take precedence.
5. This is in supersession of the O.M. of even no. dated 28.11.2022.

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To

All Registered OEMs under FAME India Scheme Phase-II

All approved applicants under PLI Scheme for Advanced Chemistry Cell (ACC)

Guidelines for Battery Safety Test

1. Cell Level tests as per International Standard UL 1642 :

a. Impact Test:

It is a mechanical stress test to observe the reaction of Li-ion cell after a sudden and measured force.

b. Temperature Cycling:

It is a test to observe the reaction of Li-ion cell after raising the chamber temperature and holding this temperature.

c. Shock:

It is a test to observe that Lithium-ion batteries do not explode or catch fire.

d. Vibration:

It is a test to observe that Lithium-ion batteries do not explode or catch fire.

e. Fire Exposure:

It is a test to observe that Lithium-ion batteries do not explode or catch fire under a range of possible abuses.

f. Altitude Simulation:

It is a test to observe that Lithium-ion batteries do not explode or catch fire when stored at a specified absolute pressure and a temperature.

2. Battery Management System (BMS) :

a. Over current protection:

It is a test to confirm that, the design conditions are such that the protection circuit gets activated.

b. Communication interface:

It is a test to confirm the communication interface works properly.

c. Cell voltage for each series check:

It is a test to confirm that cell voltage for each series can be monitored correctly.

d. Current sensors check:

It is a test to confirm charge/discharge current can be monitored correctly.

e. Cell temperature check:

It is a test to confirm specific cell temperature can be monitored correctly.

f. MOS temperature check:

It is a test to confirm specific MOS temperature can be monitored correctly.

g. Charge MOS check:

It is a test to confirm charge MOS can be turned on/off correctly.

h. Discharge MOS check:

It is a test to confirm discharge MOS can be turned on/off correctly.

i. Power rail check:

It is a test to confirm the power rail of the circuit works correctly.

j. Fuse current check:

It is a test to confirm the fuse current meets design consideration.

k. Cell balance function check:

It is a test to confirm that the cell balance function works correctly.

3. **Battery Pack level :**

a. Case Stress:

It is a test to observe that Lithium-ion batteries do not explode or catch fire under a range of possible abuses- as per international standard IEC-62133-2.

b. Drop/Free Fall:

It is a test to observe that Lithium-ion batteries do not explode or catch fire under a range of possible abuses -as per international standard IEC-62133-2.

c. Immersion:

It is a test that checks batteries must be able to withstand environmental tests such as immersion - as per international standard UL 2271 section 38 (Light Electric Vehicle) or UL 2580 (Electric Vehicle)

d. Crush:

It is a test that checks batteries enclosure must be resistant crush - as per international standard UL 2271 section 32 (Light Electric Vehicle) or UL 2580 (Electric Vehicle)

e. Imbalance Charging:

It is a test that checks batteries are able to withstand imbalance charging as per international standard UL 2271 section 27 (Light Electric Vehicle) or UL 2580 (Electric Vehicle).