

SAFEGUARDS

SGS CONSUMER TESTING SERVICES

ELECTRICAL AND ELECTRONICS

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LITHIUM BATTERIES TEST FOR TRANSPORT BY AIR

Starting from Jan. 1, 2009, the valid and latest version of TECHNICAL INSTRUCTIONS FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR issued by ICAO (International Civil Aviation Organization) has added new UN (United Nations) serial number for dangerous goods, and lithium batteries will be classified as lithium ion batteries (UN 3090) and lithium metal batteries (UN 3480). As lithium batteries is easy to cause fire and explosion and the like during transportation, CAAC (Civil Aviation Administration of China) exclusively issued TRANSPORT REGULATIONS FOR LITHIUM BATTERIES to each air lines to enhance the safe transport for lithium batteries. According to the regulation, the lithium batteries can't be accepted for transport by air if they haven't the test report according to UN 38.3 or relevant approved certificates.



Products

Lithium Ion or Lithium Polymer Cells and Batteries

Standards

UN 38.3, Sub-section 38.3 of Part III, Recommendations on the TRANSPORT OF DANGEROUS GOODS Manual of Tests and Criteria (ST/SG/AC.10/11/Rev.4)

1. DANGEROUS GOODS LIST of Lithium Batteries

UN 3480 :Lithium ion batteries (including lithium polymer batteries)

UN 3481 :Lithium ion batteries contained in equipment
(including lithium polymer batteries)

UN 3481 :Lithium ion batteries packed with equipment
(including lithium polymer batteries)

UN 3090 :Lithium metal batteries
(including lithium alloy batteries)

UN 3091 :Lithium metal batteries contained in equipments
(including lithium alloy batteries)

UN 3091 :Lithium metal batteries packed with equipments
(including lithium alloy batteries)

2. Test Requirement in UN 38.3

Test Procedure

Each cell and battery type must be subjected to tests 1 to 8. Tests 1 to 5 must be conducted in sequence on the same cell or battery. Tests 6 and 8 should be conducted using not otherwise tested cells or batteries. Test 7 may be conducted using undamaged batteries previously used in Tests 1 to 5 for purposes of testing on cycled batteries.

Test T.1 : Altitude simulation

This test simulates air transport under low-pressure conditions.

Test T.2 : Thermal test

This test assesses cell and battery seal integrity and internal electrical connections. The test is conducted using rapid and extreme temperature changes.

Test T.3 : Vibration

This test simulates vibration during transport.

Test T.4 : Shock

This test simulates possible impacts during transport.

Test T.5 : External short circuit

This test simulates an external short circuit.

Test T.6 : Impact

This test simulates an impact.

Test T.7 : Overcharge

This test evaluates the ability of a rechargeable battery to withstand an overcharge condition.

Test T.8: Forced discharge

This test evaluates the ability of a primary or a rechargeable cell to withstand a forced discharge condition.

3. Drop Test after Packed

Each package must be subjected to drop test from 1.2 m height in random direction. The batteries or primary batteries in the package shall not be damaged, and the position of the batteries shall not be changed to cause the contact to each other, and no leakage from the package shall be appeared.



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