

**YD**

**INDUSTRY STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**YD 1268.1-2003**

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**[YD/T 1268.1-2003] The safety specification and test method for  
lithium batteries  
(English Translation)**

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### 1 Scope

This Standard specifies the safety performance requirements for lithium battery of mobile communication handset, including safety requirements and test methods for normal use and possible false operation.

This Standard is applicable to lithium battery of mobile communication handset (hereinafter referred to as the battery) and lithium battery cell (hereinafter referred to as the battery cell).

### 2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 2.1

lithium battery cell a device that contains metallic lithium, lithium alloy or lithium ion, is capable of converting chemical energy directly into electrical energy; this device includes electrode, diaphragm, container, and terminal

#### 2.2

lithium battery assembly of lithium battery cell, used for power supply, with voltage, size, terminal device, capacity and rate characteristics

#### 2.3

rated capacity the released capacity that when the battery or battery cell, under the conditions specified by the manufacturer, after charging and storing, is discharged in a  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$  environment at a current of  $0.2C_{5A}$  to the termination voltage specified by the manufacturer

## **2.4**

fully charged according to the manufacturer's recommended charging method (including the determination method for charging termination), when the internal storage capacity of the battery or battery cell reaches the maximum value, it is considered as fully charged rupture, explosion and spontaneous combustion. If the battery cell is packaged in a housing, the form of the package and the method of packaging shall not cause the battery to overheat during normal operation, nor shall it restrict the release of internal pressure.

### **4.1.3 Temperature/current management**

The battery shall be designed to prevent abnormal rises in battery temperature.

**NOTE:** If necessary, safety limit shall be set when the battery is charged and discharged.

### **4.1.4 Terminal connection**

The battery housing shall clearly indicate the polarity of the terminal. The size and shape of the terminal shall ensure the maximum current expected to be carried. The external terminal surface shall be made of a conductive material with good mechanical properties and corrosion resistance. The terminal shall be designed to be the least likely to have a short circuit.

### **4.1.5 Battery cell assembled into battery**

The capacities of battery cell and assembled battery shall be closely matched.

The battery cells assembled in the same battery shall have the same structure, the same chemical composition, and be produced by the same manufacturer.

### **4.2.1 Continuous low rate charging**

After the battery cell is tested according to the test method specified in 6.1, it shall not be on fire, explode or leak.

### **4.2.2 Vibration**

After the battery is tested according to the test method specified in 6.2, the battery shall not be on fire, explode or leak.

### **4.2.3 High temperature performance**

After the battery is tested according to the test method specified in 6.3, the outer casing shall be free of deformation or its deformation shall not cause the internal components of the battery to be exposed.

#### 4.2.4 Temperature cycle

After the battery cell or battery is tested according to the test method specified in 6.4, it shall not be on fire, explode or leak.

#### 4.2.5 Low temperature performance

Place the fully charged battery or battery cell in a thermostat that can be thermostated mandatorily. Perform  $-20^{\circ}\text{C} \sim 75^{\circ}\text{C}$  temperature cycle according to the following procedures.

- (1) make the temperature in thermostat rise to  $70^{\circ}\text{C} \pm 2^{\circ}\text{C}$  within 30min and maintain 4h at this temperature;
- (2) make the temperature in thermostat drop to  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$  within 30min and maintain 2h at this temperature;
- (3) make the temperature in thermostat drop to  $-20^{\circ}\text{C} \pm 2^{\circ}\text{C}$  within 30min and maintain 4h at this temperature;
- (4) make the temperature in thermostat rise to  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$  within 30min and maintain 2h at this temperature;
- (5) repeat (1)~(4) and do 4 cycles;
- (6) after the 5th cycle, check the battery after it is stored for 2h, which shall meet the requirements of 4.2.4.

**NOTE:** This test can be performed in a thermostat that can be thermostated mandatorily. It can also be carried out between 3 thermostats of different temperatures.

#### 6.5 Low voltage performance test

Place the fully charged battery cell in a vacuum oven at  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ . Perform vacuuming to keep the air pressure  $< 11.6\text{kPa}$  for 6h. After the test, it shall meet the requirements of 4.2.5.

#### 6.6 External short circuit

Place the fully charged battery or battery cell at  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$  and  $55^{\circ}\text{C} \pm 5^{\circ}\text{C}$  for

2h, respectively. Then use wiring to short connect the positive and negative terminals of each cell or battery and make sure all the external resistances

$< 100\text{mohm}$ . After short connection, maintain 24h or till the temperature of external housing of battery cell or battery is dropped to.

Battery cell or battery original temperature + (maximum temperature rise after battery cell

or battery short circuit x20%).

After the test, it shall meet the requirements of 4.3.1.

### **6.7 Free fall test**

Freely drop the fully charged battery cell or battery in any method from the height of 1m to the concrete floor 3 times. After the test, it shall meet the requirements of 4.3.2.

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