



**比亚迪股份有限公司**  
**BYD COMPANY LIMITED**

**SEALED NICKEL CADMIUM**

**RECHARGEABLE CELLS & BATTERIES**

**APPROVAL SHEET**

**TO :** \_\_\_\_\_

**BYD MODEL NO :**           D-D4500A          

**CUSTOMER APPROVED P/N :** \_\_\_\_\_

**DATE OF SUBMISSION :**           08-Oct-11          

**ATTACHMENT :**           SPECIFICATION          

**TOTAL NO. OF PAGES :**           5          

**SPECIFICATION NO :**           S-DD4500A01          

**VERSION NO :**           1.0          

| <b>Drawn</b>    | <b>CUI-MIAO</b>              |                      |
|-----------------|------------------------------|----------------------|
| <b>Approved</b> | <b>Customer Dept.</b>        | <i>GUOQING-LI</i>    |
|                 | <b>Technology Dept.</b>      | <i>ZHENGYI-HUANG</i> |
|                 | <b>Quality Control Dept.</b> | <i>DONGXU-CHEN</i>   |

*(with company chop)*

*Please sign and return one copy to us*

**BYD COMPANY LIMITED**

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## 5.2 TEST METHOD &amp; PERFORMANCE

| Test                      | Unit        | Specification              | Conditions  | Remarks                    |
|---------------------------|-------------|----------------------------|---|----------------------------|
| Capacity                  | mAh         | ≥4500                      | Standard charge/discharge                               | up to 3 cycles are allowed |
| Open Circuit Voltage(OCV) | Voltage (V) | ≥1.25                      | After 1 hour standard charge                            |                            |
| Internal impedance        | mΩ/cell     | ≤10                        | Upon fully charge (1KHz)                                |                            |
| High rate discharge(1C)   | minute      | ≥54(4050mAh)               | Standard charge before discharge                        | End Voltage is 1.0V/Cell   |
| Overcharge                |             | no leakage nor explosion   | 450 mA(0.1C) charge for 28 days                         |                            |
| Charge Retention          | mAh         | ≥3150                      | standard charge; storage: 28 days<br>Standard discharge |                            |
| Cycle Life                | cycle       | 500                        | IEC61951-1  | see note 3                 |
| Leakage                   |             | no leakage nor deformation | Fully charge at 4500 mA(1C), then storage 14 days       |                            |

Note 3 IEC61951-1 cycle life

| Cycle number | Charge            | Rest | Discharge            |
|--------------|-------------------|------|----------------------|
| 1            | 0.1CmA for 16h    | none | 0.25CmA for 2.33h    |
| 2~48         | 0.25CmA for 3.17h | none | 0.25CmA for 2.33h    |
| 49           | 0.25CmA for 3.17h | none | 0.25CmA to 1.0V/cell |
| 50           | 0.1CmA for 16h    | 1~4h | 0.20CmA to 1.0V/cell |

50-cycle test as per above table is repeated . The discharge time of the 100th, 200th, 300th, 400th, 500th should be more than 3 hours respectively. (Ambient temperature is 20±5)

## 5.3 Humidity

The cells shall not leak during the 14 days when it is submitted to the condition of a temperature of 33±3 and a relative humidity of 80±5% (salting is allowed).

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#### 5.4 Vibration

Cells shall be mechanically and electrically normal after vibration which has an amplitude of 4mm(0.1575 inches) a frequency of 1000 cycles per minute, which should be continued in any directions during 60 minutes

#### 5.5 Shock

Cells shall be mechanically and electrically normal after being subjected to a drop from a height of 450mm (17.716inches) onto an oak board in a voluntary axis respectively 3 times.

#### 5.6 Short

Cells shall not explode after 1 hour short-circuit test.

#### 5.7 Incorrect polarity charging

Cells shall not explode after 5 hour of incorrect polarity charging at 1 CmA.

### 6. PRECAUTION

6.1 We recommend you to set the cut-off voltage at 1.0V/cell.

6.2 If it is below 1.0V/cell, cells may have over-discharged or reverse charged.

6.3 Do not detect - V for first 5 minutes of charging.

6.4 The cells shall be delivered in discharged condition, Before testing or using, the cells shall be correctly charged in accordance with this specifications.

### 7. WARNING

7.1 Avoid direct soldering onto cells.

7.2 Observe correct polarity when connecting.

7.3 Do not charge with more than our specified current.

7.4 Use only within the specified working temperature range.

7.5 Do not subject cells or batteries to mechanical shock.

7.6 Do not mix cells of different manufacture, capacity, size or type within a battery.

7.7 Seek medical advice immediately if a cell or battery has been swallowed.

7.8 When disposing of secondary cells or batteries ,keep cells or batteries of different electro-chemical systems separate from each other.

7.9 Do not maintain secondary cells and batteries on charge when not in use.

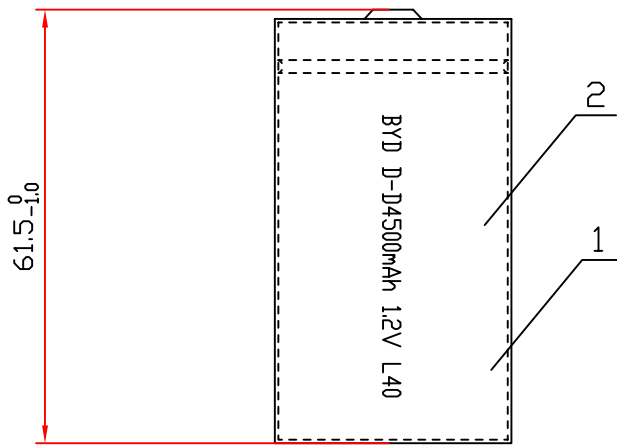
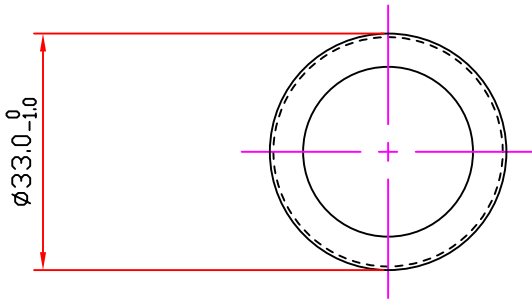
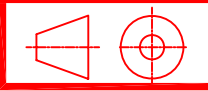
### 8. DANGER!

8.1 Avoid throwing cells into a fire or attempting to disassemble them. As the electrolyte inside is strong alkaline and can damage skin and clothes.

8.2 Avoid short circuiting. It may be leakage.

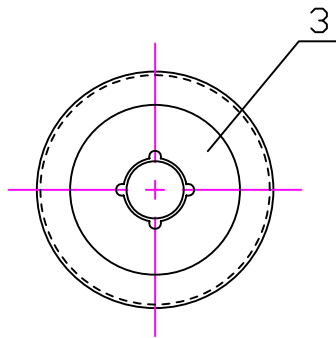
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| NO. | NAME   | SIZE  | QTY | NOTE  | SAP NO |
|-----|--------|-------|-----|-------|--------|
| 3   | WASHER | D     | 1   | WHITE | 413877 |
| 2   | PVC    | 51X70 | 1   | 116C  | 400536 |
| 1   | CELL   | D     | 1   | NI-CD |        |



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|          |              |      |            |
|----------|--------------|------|------------|
| DRAWN    | CUI-MIAD     | DATE | 2011/10/08 |
| CHECKD   | GUOQING-LI   | DATE | 2011/10/08 |
| APPROVED | JIANGUO-TANG | DATE | 2011/10/08 |
| SCALE    | /            | UNIT | MM         |