



Ref. Certif. No.

SG-BT-00002

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST  
CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE)  
CB SCHEMESYSTEME CEI D'ACCEPTATION MUTUELLE DE  
CERTIFICATS D'ESSAIS DES EQUIPEMENTS  
ELECTRIQUES (IECEE)METHODE OC**CB TEST CERTIFICATE**  
**CERTIFICAT D'ESSAI OC**Product  
ProduitBatteries  
(Rechargeable lithium ion cell)Name and address of the applicant  
Nom et adresse du demandeurShenzhen Bak Battery Co., Ltd.  
BAK Industrial Park, Kuichong Street, Longgang District  
518119 Shenzhen, PEOPLE'S REPUBLIC OF CHINAName and address of the manufacturer  
Nom et adresse du fabricantShenzhen Bak Battery Co., Ltd., BAK Industrial Park, Kuichong  
Street, Longgang District, 518119 Shenzhen, PEOPLE'S  
REPUBLIC OF CHINAName and address of the factory  
Nom et adresse de l'usineShenzhen Bak Battery Co., Ltd., BAK Industrial Park, Kuichong  
Street, Longgang District, 518119 Shenzhen, PEOPLE'S  
REPUBLIC OF CHINARating and principal characteristics  
Valeurs nominales et caractéristiques principalesRated voltage: 3,7 V d.c.  
Rated capacity: 2200 mAhTrade mark (if any)  
Marque de fabrique (si elle existe)

BAK

Model/type Ref.  
Ref. de type

18650C4





Additional information (if necessary)  
Information complémentaire (si nécessaire)A sample of the product was tested and found  
to be in conformity with  
Un échantillon de ce produit a été essayé et a été  
considéré conforme à la


IEC 62133:2002

as shown in the Test Report Ref. No.  
which form part of this certificate  
comme indiqué dans le Rapport d'essais numéro  
de référence qui constitue une partie de ce  
certificatTÜV SÜD PSB Pte Ltd  
211-2610035-000This CB Test Certificate is issued by the National Certification Body  
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**Date, 2010-06-17  
CBS 10 06 74293 001  
(Harry Zhang)




PSB Singapore

TÜV SÜD PSB Pte Ltd - 1 Science Park Drive - Singapore 118221

		<p>Test Report issued under the responsibility of:</p> <p><b>NCB TÜV SÜD PSB Pte Ltd.</b>  <b>1 Science Park Drive</b>  <b>Singapore 118221</b></p>  Product Service
<p><b>TEST REPORT</b>  <b>IEC 62133 First Edition</b>  <b>Secondary cells and batteries containing alkaline or other non-acid electrolytes –</b>  <b>Safety requirements for portable sealed secondary cells, and for batteries made from</b>  <b>them, for use in portable applications</b></p>		
Report Reference No.....	211-2610035-000	
Date of issue.....	2010-06-09	
Total number of pages.....	17	
CB Testing Laboratory.....	Jiangsu TÜV Product Service Ltd. Shenzhen Branch	
Address.....	6/F, H Hall, Century Craftwork Culture Square, No. 4001, Fuqiang Road, Futian District, Shenzhen 518048 P.R. China	
Applicant's name.....	SHENZHEN BAK BATTERY CO., LTD.	
Address.....	BAK Industrial Park, Kuichong Street, Longgang District, Shenzhen 518119 P.R. China	
<b>Test specification:</b>		
Standard.....	IEC 62133: 2002 (1st Edition)	
Test procedure.....	CB	
Non-standard test method.....	N/A	
Test Report Form No.....	IEC62133A	
Test Report Form(s) Originator.....	UL International Demko A/S	
Master TRF.....	Dated 2008-02	
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Test item description.....	Rechargeable lithium ion cell	
Trade Mark.....	BAK	
Manufacturer.....	SHENZHEN BAK BATTERY CO., LTD. BAK Industrial Park, Kuichong Street, Longgang District, Shenzhen 518119 P.R. China	
Model/Type reference.....	18650C4	
Ratings.....	3.7V  ; 2200mAh;	

<b>Testing procedure and testing location:</b>	
<input checked="" type="checkbox"/> <b>CB Testing Laboratory:</b>	Jiangsu TÜV Product Service Ltd. Shenzhen Branch
Testing location/ address.....:	6/F, H Hall, Century Craftwork Culture Square, No. 4001, Fuqiang Road, Futian District, Shenzhen 518048 P.R. China
<input type="checkbox"/> <b>Associated CB Test Laboratory:</b>	-
Testing location/ address.....:	-
Tested by (name + signature).....:	Margery Liu
Approved by (+ signature).....:	Harry Zhang
	
<input type="checkbox"/> Testing procedure: TMP	-
Tested by (name + signature).....:	-
Approved by (+ signature).....:	-
Testing location/ address.....:	-
<input type="checkbox"/> Testing procedure: WMT	-
Tested by (name + signature).....:	-
Witnessed by (+ signature).....:	-
Approved by (+ signature).....:	-
Testing location/ address.....:	-
<input type="checkbox"/> Testing procedure: SMT	-
Tested by (name + signature).....:	-
Approved by (+ signature).....:	-
Supervised by (+ signature).....:	-
Testing location/ address.....:	-
<input type="checkbox"/> Testing procedure: RMT	-
Tested by (name + signature).....:	-
Approved by (+ signature).....:	-
Supervised by (+ signature).....:	-
Testing location/ address.....:	-



<b>Summary of testing:</b>		
<b>Tests performed (name of test and test clause):</b> Tests are made with the number of cells specified in Table 1 of IEC 62133. The test samples comply with the requirements of IEC 62133:2002 (1st Edition)	<b>Testing location:</b> Jiangsu TÜV Product Service Ltd. Shenzhen Branch 6/F, H Hall, Century Craftwork Culture Square, No. 4001, Fuqiang Road, Futian District, Shenzhen 518048 P.R. China	
<b>Summary of compliance with National Differences:</b>		
N/A		
<b>Copy of marking plate</b>		
<table border="1"> <tr> <td style="text-align: center;">           BAK            Rechargeable lithium ion cell            + 18650C4 (ICR19.65) VM0A05C 001521 -   </td> </tr> </table>		BAK Rechargeable lithium ion cell + 18650C4 (ICR19.65) VM0A05C 001521 - 
BAK Rechargeable lithium ion cell + 18650C4 (ICR19.65) VM0A05C 001521 - 		
<b>Product Code: VM0A05C 001521</b> <b>VM:Production code</b> 0: manufacture year, for example: 0 means 2010 A: manufacture month, for example: A means: Jan. 05: manufacture day: for example: 05 means: 5 <sup>th</sup> day C: manufacture line 001521: cell ordinal code		

<b>Test item particulars</b> .....	
Classification of installation and use .....	Build-in and use in portable applications
Supply Connection .....	Positive electrode: Aluminum, nickel and iron alloy
.....	Negative electrode: Nickel plated steel
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object .....	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement.....	F (Fail)
<b>Testing</b> .....	
Date of receipt of test item .....	2010-03-22
Date (s) of performance of tests .....	2010-03-22 to 2010-04-29
<b>General remarks:</b>	
<p>The test results presented in this report relate only to the object tested.  This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.  "(see Enclosure #)" refers to additional information appended to the report.  "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a point is used as the decimal separator.</p> <p><b>Factory location:</b>  <b>SHENZHEN BAK BATTERY CO., LTD.</b>  <b>BAK Industrial Park, Kuichong Street, Longgang District, Shenzhen 518119 P.R. China</b></p> <p><b>Attachment No.1: 3 pages of photos</b></p>	
<b>General product information:</b>	
<p>The cell, model no. 18650C4, is rechargeable lithium ion cell.  The cell has been tested and evaluated according to its specified working conditions (as given below), which is provided by client.</p> <p>Details information for the cell of model no. 18650C4, as following:  Nominal voltage: 3.7V  Rated capacity: 2200mAh  Charge method: Supply 1C(2200mA) constant current until voltage reaches 4.20V, then charge with constant voltage 4.20 V until charge current equals to 0.01C(22mA).  Max. Charge current: 2200mA  End of discharge voltage: 3.0V  Dimension: <math>\Phi</math>18.3mmx65.0mm  Weight: Approx 45.0g</p>	

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
<b>1</b>	<b>General</b>		P
	Parameter measurement tolerances		P
<b>2</b>	<b>General Safety Considerations</b>		P
	Cells and batteries subject to intended use be safe and continue to function in all respects		P
	Cells and batteries subject to reasonably foreseeable misuse do not present significant hazards.		P
<b>2.1</b>	<b>Insulation and Wiring</b>		N/A
	-Insulation Resistance between an accessible metal case (excluding electrical contacts) and positive terminals $\geq 5M\Omega$ .		N/A
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		N/A
	Orientation of wiring maintains adequate creepage and clearance distances between conductors. Mechanical integrity of internal connections are sufficient to accommodate conditions of reasonably foreseeable misuse.		N/A
<b>2.2</b>	<b>Venting</b>		P
	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and self-ignition.	See test of clause 4 One gas ventilator in cap assembly.	P
	Encapsulant used to support cells within an outer casing does not cause the battery to overheat during normal operation no inhibit pressure relief.		N/A
<b>2.3</b>	<b>Temperature/current management</b>		N/A
	The batteries are designed such that abnormal temperature rise conditions are prevented.	PTC protection in the cell	N/A
	Means is provided to limit current to safe levels during charge and discharge.		N/A
<b>2.4</b>	<b>Terminal contacts</b>		N/A
	Terminals have a clear polarity marking on the external surface of the battery		N/A
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current.		N/A
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance.		N/A



IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminal contacts are arranged to minimize the risk of short circuits.		N/A
2.5	<b>Assembly of cells into batteries</b>		N/A
	Cells used in the battery assembly have closely matched capacities, are of the same design, and are of the same chemistry and same manufacturer.		N/A
	The battery incorporates separate circuitry to prevent cell reversal from uneven charges as the pack is designed for the selective discharge of a portion of its series connected cells.		N/A
2.6	<b>Quality Plan</b>		N/A
	The manufacture has prepared a quality plan defining the procedures for the inspection of materials, components, cells and batteries and which covers the process of producing each type of cell and battery.		N/A
3	<b>Type Test Conditions</b>		P
	Tests were conducted with the number of cells or batteries as outlined in Table 1 of IEC 62133 with cells or batteries that were not more than 3 months old.	Tests are performed according to specified in table 1 of the standard. The cell samples are not more than 3 months old.	P
	Unless noted otherwise in the test methods, testing was conducted in an ambient of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ .	The tests are conducted in an ambient of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$	P
4	<b>Specific requirements and tests</b>		P
4.1	<b>Charging procedure for test purposes</b>		P
4.2	<b>Intended Use</b>		P
4.2.1	Continuous Low Rate Charge		P
	Fully charged cells are subjected for 28 days to a charge as specified by the manufacturer.		P
	Nickel systems: no fire, no explosion		N/A
	Lithium systems: no fire, no explosion, no leakage	See Table 4.2.1.	P
4.2.2	Vibration		P
	The measured open circuit voltage of the fully charged cells or batteries is within anticipated parameters		P

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	The cells or batteries are subjected to a vibration sequence as outlined in Table 2 of IEC 62133 with amplitude of 0.75 mm and a total maximum excursion of 1.52 mm. The frequency was varied at the rate of 1 Hz/min between the limits of 10 Hz and 55 Hz. The entire range of frequencies (10 Hz to 55 Hz) and return (55 Hz to 10 Hz) was traversed in 90 min $\pm$ 5 min for each mounting position.		P
	The vibration was applied in each of three mutually perpendicular directions.		P
	Results: no fire, no explosion, no leakage	See Table 4.2.2.	P
4.2.3	Moulded case stress at high ambient temperature		N/A
	Fully charged batteries were placed in an air-circulating oven at a temperature of 70°C $\pm$ 2°C for 7 hours. Afterwards, they are removed and allowed to return to room temperature.		N/A
	Results: no physical distortion of the battery casing resulting in exposure of internal components.		N/A
4.2.4	Temperature cycling		P
	Fully charged cells or batteries were subjected to temperature cycling (-20C, +75C) in forced draught chambers according to the procedure outlined in 4.2.4 b) and Fig. 1 of IEC 62133.		P
	After the fifth cycle, the cells or batteries were stored for 7 days prior to examination.		P
	Results: No fire, no explosion, no leakage		P
<b>4.3</b>	<b>Reasonably foreseeable misuse</b>		P
4.3.1	Incorrect installation of a cell (nickel systems only)		N/A
	Four fully charged cells of the same brand, type, size and age were connected in series with one of the four cells reversed. The assembly was connected across a 1-ohm resistor until the vent opens or until the temperature of the reversed cell returns to ambient temperature.		N/A
	Alternatively, a stabilized dc power supply was used to simulate the conditions imposed on the reversed cell.		N/A
	Results: no fire, no explosion		N/A
4.3.2	External short circuit		P
	Fully charged cells or batteries were subjected to a short circuit test at 20°C $\pm$ 5°C.		P
	Fully charged cells or batteries were subjected to a short circuit test at 55°C $\pm$ 5°C.		P



IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	The external resistance did not exceed 100 mΩ.		P
	The cells or batteries were tested for 24 h or until the case temperature declined by 20% of the maximum temperature rise.	The cells were terminated until the case temperature declined by 20% of the maximum temperature rise.	P
	Results: no fire, no explosion.	See Table 4.3.2.	P
4.3.3	Free fall		P
	Fully charged cells or batteries were dropped 3 times from a height of 1.0 m onto a concrete floor.		P
	Results: no fire, no explosion		P
4.3.4	Mechanical shock (crash hazard)		P
	Fully charged cells or batteries were subjected to a total of three shocks of equal magnitude applied in each of three mutually perpendicular directions. At least one of the directions was perpendicular to a flat face. During the initial 3 milliseconds, the minimum average acceleration was 75 g <sub>n</sub> . The peak acceleration was between 125 g <sub>n</sub> and 175 g <sub>n</sub> .		P
	Results: no fire, no explosion, no leakage		P
4.3.5	Thermal abuse		P
	Fully charged cells were placed in a gravity or circulating air-convection oven. The oven temperature was raised at a rate of 5°C/min ± 2°C/min to a temperature of 130°C ± 2°C. The cell remained at that temperature for 10 minutes before the test was discontinued.		P
	Results: no fire, no explosion		P
4.3.6	Crushing of cells		P
	Fully charged cells were crushed between two flat surfaces with a hydraulic ram exerting a force of 13 kN ± 1 kN.		P
	A cylindrical or prismatic cell was crushed with its longitudinal axis parallel to the flat surfaces of the crushing apparatus.		P
	A second set of prismatic cells was tested, rotated 90 degrees around their longitudinal axis compared to the first set.		N/A
	Results: no fire, no explosion.		P
4.3.7	Low pressure		P

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	Fully charged cells are placed in a vacuum chamber whose internal pressure was gradually reduced to a pressure equal to or less than 11.6 kPa and held at that value for 6 hours.		P
	Results: no fire, no explosion, no leakage		P
4.3.8	Overcharge for nickel systems		N/A
	A discharged cell or battery was subjected to a high-rate charge of 2.5 times the recommended charging current for a time that produced a 250% charge input (250% of rated capacity).		N/A
	Results: no fire, no explosion.		N/A
4.3.9	Overcharge for lithium systems		P
	A discharged cell was charged from a power supply of $\geq 10$ V, at a charging current $I_{rec}$ recommended by the manufacturer for 2.5 $C_5/I_{rec}$ hours..	The recommended charging current is 2200mA. The test duration is 2.5 hours.	P
	Results: no fire, no explosion.	See Table 4.3.9.	P
4.3.10	Forced discharge		P
	Discharged cells intended for use in multi-cell applications, were subjected to a reverse charge 1t 1.0 $I_1$ (A) for 90 minutes.		P
	Results: no fire, no explosion	See Table 4.3.10.	P
4.3.11	Cell protection against a high charging rate (lithium systems only)		P
	Discharged cells were charged at three times the charging current recommended by the manufacturer until the cells was fully charged or an internal safety devices cut off the charge current before the cell became fully charged.		P
	Results: no fire, no explosion	See Table 4.3.11.	P
<b>5</b>	<b>Information for safety</b>		P
	Information is provided to equipment manufacturers in the form of instructions to minimize and mitigate hazards associated with the cells or batteries in accordance with guidelines outlined in informative Annex A.		P
	Information is provided to end-users in the form of instructions to minimize and mitigate hazards associated with the batteries in accordance with guidelines outlined in informative Annex B.		N/A
<b>6</b>	<b>Marking</b>		
6.1	Cell Marking		P

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	Nickel system cells are marked in accordance with IEC 61951-1, -2, IEC 61440, or IEC 61436 as applicable. See Copy of Marking Plate item in the beginning of this report.		N/A
	Lithium system cells are marked in accordance with IEC 61960. See Copy of Marking Plate item in the beginning of this report.		P
6.2	<b>Battery Marking</b>		N/A
	Batteries of nickel systems are marked in accordance with IEC 61951, or IEC 61951 -2 as applicable. See Copy of Marking Plate item in the beginning of this report		N/A
	Batteries of lithium system are marked in accordance with IEC 61960. See Copy of Marking Plate item in the beginning of this report.		N/A
	Batteries are marked with the cautionary marks.		N/A
6.3	<b>Other Information</b>		N/A
	Disposal instructions are marked on the battery or supplied in the information packaged with the battery.		N/A
	Recommended charging instruction are marked on the battery or supplied in the information packaged with the battery.		N/A
6.3	<b>Other Information</b>		N/A
	Disposal instructions are marked on the battery or supplied in the information packaged with the battery.		N/A
	Recommended charging instruction are marked on the battery or supplied in the information packaged with the battery.		N/A
7	<b>Packaging</b>		
	Cells or batteries were provided with packaging that was adequate to avoid mechanical damage during transport, handling and stacking. The materials and pack design was chosen to prevent the development of unintentional electrical conduction, corrosion of the terminal and ingress of moisture.		N/A



2.1 – 2.5 TABLE: List of critical Components					P
Object/part No.	Manufacturer/ trademark	Type/Model	Technical Data	Standard	Marks of Conformity
Cells	Shenzhen BAK Battery Co., Ltd.	18650C4	2200mAh,3.7V	-	-
- Electrolyte	Dongguan Shanshan Power Sources Material Co., Ltd.	LD-88	LiPF <sub>6</sub> ,EC,EMC	-	-
- Separator	UBE Industries; Ltd.	UB3085	25μm×60mm×750mm, PP and PE two layers	-	-
- Negative electrode	Shenzhen BAK Battery Co., Ltd.	158μm×58mm×682mm	Graphite, CMC, SBR, Conductive Additive, Copper Foil	-	-
- positive electrode	Shenzhen BAK Battery Co., Ltd.	138μm×56mm×660mm	LCO, NMP, PVDF, Conductive, Additive, Aluminum Foil	-	-
- positive electrode tab	Changcheng Huiling Aluminium Industries Co., Ltd.	0.10mm×3mm	Aluminum belt	-	-
- Negative electrode tab	Jiangsu Yuanhang Metal Company	0.07mm×4mm	Nickel belt	-	-
- Negative can	Wuxi Jinyang New Power Source Co., Ltd.	Φ18.00mm×68.3mm	Nickel plated steel	-	-
- Insulation	Shenzhen Changfeng Photoelectricity accessories material Co., Ltd.	Φ17.2mm×0.3mm	PET	-	-
- PTC	Tyco Electronics Corporation	PSR-26476	Vmax: 15Vdc, Res: 0.015-0.025ohm Ihold: 2.2A; Itrip: 5.2A	-	UL E74889
- Cap electrode	Chang Zhou Wu Jin Zhong Rui Electronics Corporation	Φ17.5mm × 4.0mm	Aluminum, Nickel and Iron alloy	-	-
supplementary information:					

TABLE: 4.2.1 Continuous Low Rate Charge Test					P
Model	Recommended Charging Method, CC, CV, or CC/CV	Recommended Charging Voltage Vc, Vdc	Recommended Charging Current Irec, A	OCV at Start of Test, Vdc	Results
18650C4 (#41446)	CC/CV	4.20	2.20	4.199	No Fire or Explosion or Leakage
18650C4 (#41447)	CC/CV	4.20	2.20	4.199	No Fire or Explosion or Leakage
18650C4 (#41448)	CC/CV	4.20	2.20	4.201	No Fire or Explosion or Leakage
18650C4 (#41449)	CC/CV	4.20	2.20	4.198	No Fire or Explosion or Leakage
18650C4 (#41450)	CC/CV	4.20	2.20	4.200	No Fire or Explosion or Leakage
supplementary information:					
<ul style="list-style-type: none"> <li>- No Fire or Explosion</li> <li>- No Leakage</li> <li>- Leakage</li> <li>- Fire</li> <li>- Explosion</li> <li>- Bulge</li> <li>- Other (Please Explain)</li> </ul>					

TABLE: 4.2.2 – Vibration Test			P
Model	OCV at Start of Test, Vdc	Results	
18650C4(#41503)	4.186	No Fire or Explosion or leakage	
18650C4(#41504)	4.185	No Fire or Explosion or leakage	
18650C4(#41505)	4.189	No Fire or Explosion or leakage	
18650C4(#41506)	4.179	No Fire or Explosion or leakage	
18650C4(#41507)	4.182	No Fire or Explosion or leakage	
supplementary information:			
<ul style="list-style-type: none"> <li>- No Fire or Explosion</li> <li>- No Leakage</li> <li>- Leakage</li> <li>- Fire</li> <li>- Explosion</li> <li>- Bulge</li> <li>- Other (Please Explain)</li> </ul>			

TABLE: 4.3.1 – Incorrect Installation of a Cell Test (Nickel Systems)			N/A
Model	OCV (reversed cell) Vdc	Results	
supplementary information:			
<ul style="list-style-type: none"> <li>- No Fire or Explosion</li> <li>- No Leakage</li> <li>- Leakage</li> <li>- Fire</li> <li>- Explosion</li> <li>- Bulge</li> <li>- Other (Please Explain)</li> </ul>			

TABLE: 4.3.2 – External Short Circuit Test					P
Model	Ambient (At 20°C ± 5°C or 55°C ± 5°C)	OCV at start of test, Vdc	Resistance of Circuit, Ω	Maximum Case Temperature Rise ΔT, °C	Results
18650C4(#41483, #41493)	24.0°C /55.5°C	4.180/4.177V	0.026Ω/0.026Ω	79.9/57.0	No Fire or Explosion
18650C4(#41484, #41494)	24.0°C /55.5°C	4.182/4.176V	0.026Ω/0.026Ω	92.2/60.2	No Fire or Explosion
18650C4(#41485, #41495)	24.0°C /55.5°C	4.181/4.177V	0.026Ω/0.026Ω	84.9/59.9	No Fire or Explosion
18650C4(#41486, #41496)	24.0°C /55.5°C	4.185/4.173V	0.026Ω/0.026Ω	83.4/59.8	No Fire or Explosion
18650C4(#41487, #41497)	24.0°C /55.5°C	4.183/4.179V	0.026Ω/0.026Ω	90.1/61.4	No Fire or Explosion
supplementary information:					
<ul style="list-style-type: none"> <li>- No Fire or Explosion</li> <li>- No Leakage</li> <li>- Leakage</li> <li>- Fire</li> <li>- Explosion</li> <li>- Bulge</li> <li>- Other (Please Explain)</li> </ul>					



TABLE: 4.3.8 – Overcharge Test (Nickel Systems)					N/A
Model	OCV prior to charging, Vdc	Maximum Charge Current, A	Time for Charging, h	Results	
supplementary information:					
<ul style="list-style-type: none"> <li>- No Fire or Explosion</li> <li>- No Leakage</li> <li>- Leakage</li> <li>- Fire</li> <li>- Explosion</li> <li>- Bulge</li> <li>- Other (Please Explain)</li> </ul>					

TABLE: 4.3.9 – Overcharge Tests (Lithium Systems)						P
Model	OCV at start of test, Vdc	Maximum Charging Current, mA	Maximum Charging Voltage, Vdc	Total Time of Charging, h	Results	
18650C4 (#41468)	3.201	2200	10.0	2.5	No Fire or Explosion	
18650C4 (#41469)	3.215	2200	10.0	2.5	No Fire or Explosion	
18650C4 (#41470)	3.244	2200	10.0	2.5	No Fire or Explosion	
18650C4 (#41471)	3.211	2200	10.0	2.5	No Fire or Explosion	
18650C4 (#41472)	3.280	2200	10.0	2.5	No Fire or Explosion	
supplementary information:						
<ul style="list-style-type: none"> <li>- No Fire or Explosion</li> <li>- No Leakage</li> <li>- Leakage</li> <li>- Fire</li> <li>- Explosion</li> <li>- Bulge</li> <li>- Other (Please Explain)</li> </ul>						

TABLE: 4.3.10 – Forced Discharge Test				P
Model	OCV before application of reverse charge, Vdc	Measured Reverse Charge It, A	Total Time for Reversed Charge Application, Min	Results
18650C4(#41478)	3.298	2.20	90	No Fire or Explosion
18650C4(#41479)	3.239	2.20	90	No Fire or Explosion
18650C4(#41480)	3.253	2.20	90	No Fire or Explosion
18650C4(#41481)	3.248	2.20	90	No Fire or Explosion
18650C4(#41482)	3.310	2.20	90	No Fire or Explosion
supplementary information:				
<ul style="list-style-type: none"> <li>- No Fire or Explosion</li> <li>- No Leakage</li> <li>- Leakage</li> <li>- Fire</li> <li>- Explosion</li> <li>- Bulge</li> <li>- Other (Please Explain)</li> </ul>				

TABLE: 4.3.11 – Cell Protection Against a High Charging Rate Test (Lithium Systems)				P
Model	OCV at start of test, Vdc	Maximum Charging Current, mA	Maximum Charging Voltage, Vdc	Results
18650C4(#41473)	3.296	6600	4.20	No Fire or Explosion
18650C4(#41474)	3.301	6600	4.20	No Fire or Explosion
18650C4(#41475)	3.251	6600	4.20	No Fire or Explosion
18650C4(#41476)	3.248	6600	4.20	No Fire or Explosion
18650C4(#41477)	3.304	6600	4.20	No Fire or Explosion
supplementary information:				
<ul style="list-style-type: none"> <li>- No Fire or Explosion</li> <li>- No Leakage</li> <li>- Leakage</li> <li>- Fire</li> <li>- Explosion</li> <li>- Bulge</li> <li>- Other (Please Explain)</li> </ul>				

---End of Test Report---

TRF No.: IEC62133a







## List of test equipment used:

(Note: This is an example of the required attachment. Other forms with a different layout but containing similar information are also acceptable.)

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date
1	68-1-53-08-004	Temperature and humidity recorder	5-40°C, 0-100%	2010-12-14
2	68-1-39-07-006	Stop Watch	-	2010-8-23
3	68-2-47-08-001	Electrical analytical balance	0~100g	2010-05-24
4	68-1-34-08-010	Multimeter	0~1000V, 0~3A	2010-5-11
5	68-1-34-04-005	Multimeter, graphical	0~1000V, 0~10A	2011-03-03
6	68-1-93-09-031	Battery Testing System	0~3A, 0~5V	2010-08-30
7	68-1-93-09-035	Rechargeable battery performance tester	0~3A, 0~10V	2010-09-07
8	68-1-93-09-036	Rechargeable battery performance tester	20V, 15A	2010-9-7
9	68-1-93-09-030	Vibration Test System	Frequency: 5~4000Hz Max. Accelerate speed: 98g Max displacement: 25mm	2010-08-30
10	68-1-90-09-012	High-low temperature test oven	-60~+150°C	2010-07-20
11	68-1-90-09-011	Explosion protection high temperature test oven	0~+200°C	2010-07-20
12	68-1-40-04-006	Temperature data logger	-	2010-12-29
13	68-1-93-09-034	Battery Free fall tester	0~1.5m	-
14	68-1-18-06-021	Measure Tape(3.6m)	0~3.6m	2010-12-17
15	68-1-93-09-033	Crushing of cells tester	13KN±1KN	2010-9-20
16	625020206	Shock Test System	5g~600g, 1~30ms	2010-08-29
17	625051611	Pressure and Temperature Chamber	-70~+180°C, 1~760mmHg	2010-6-10

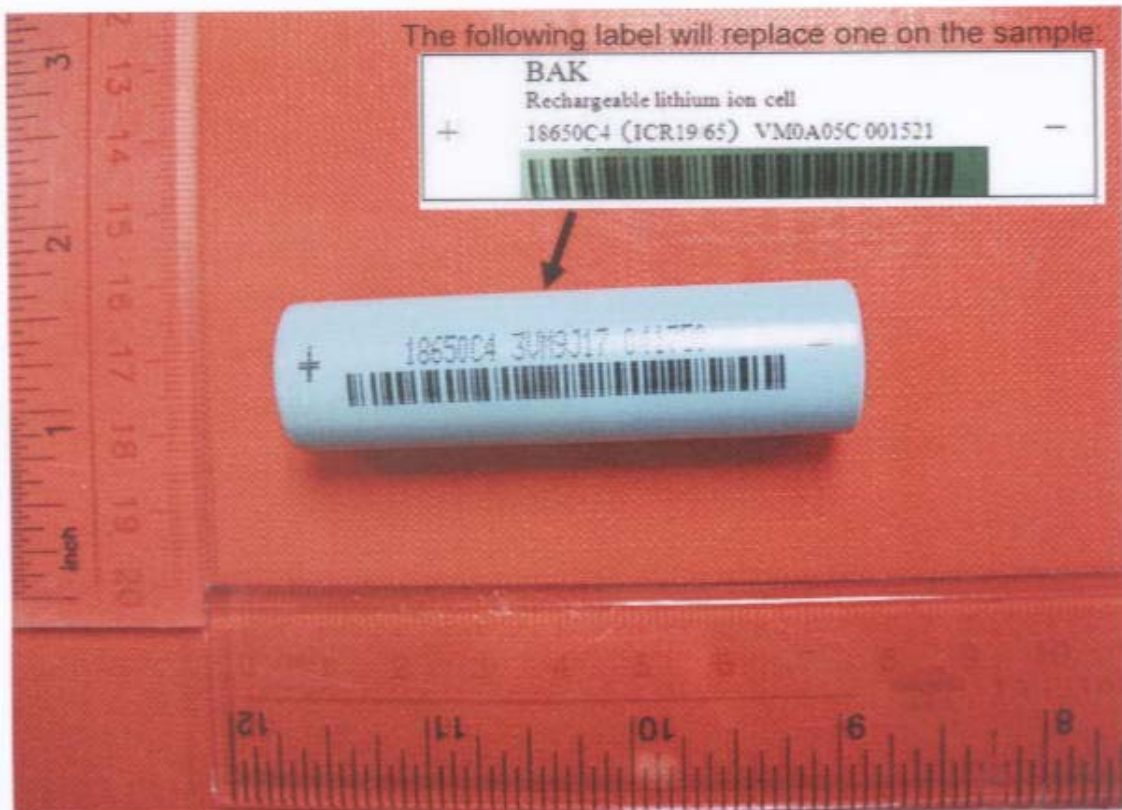


Fig. 1 -Front Overview

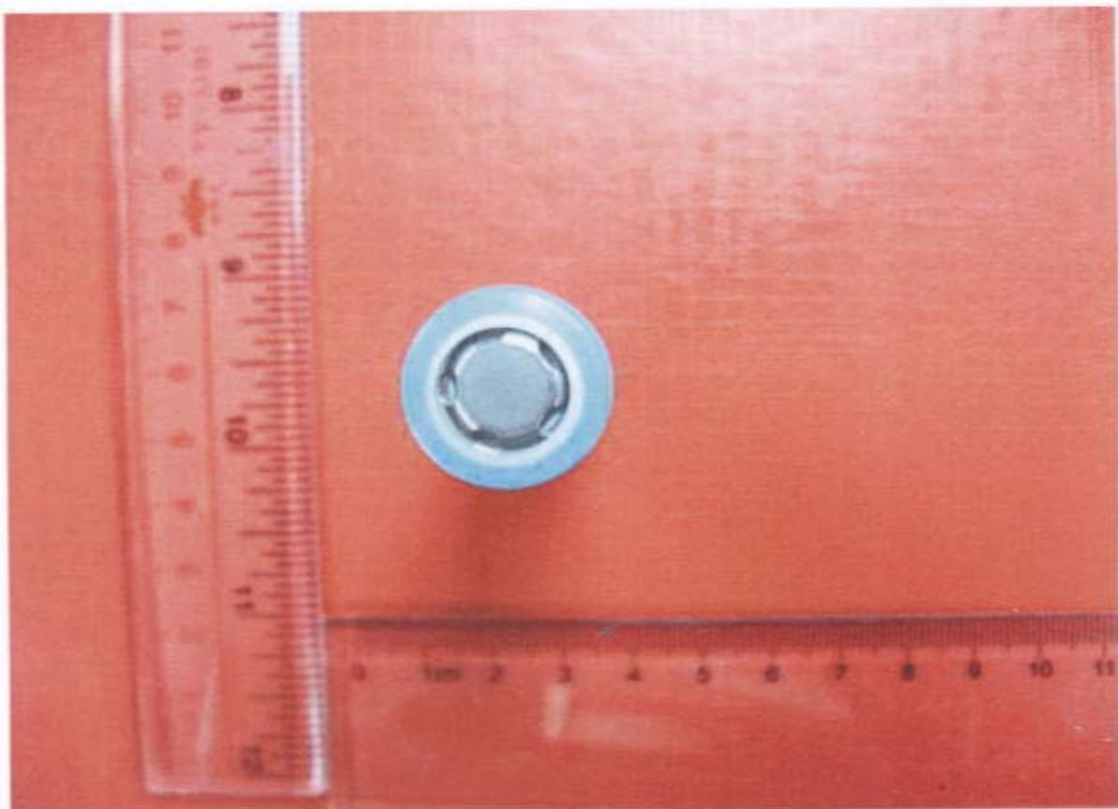


Fig. 2 - Top Overview



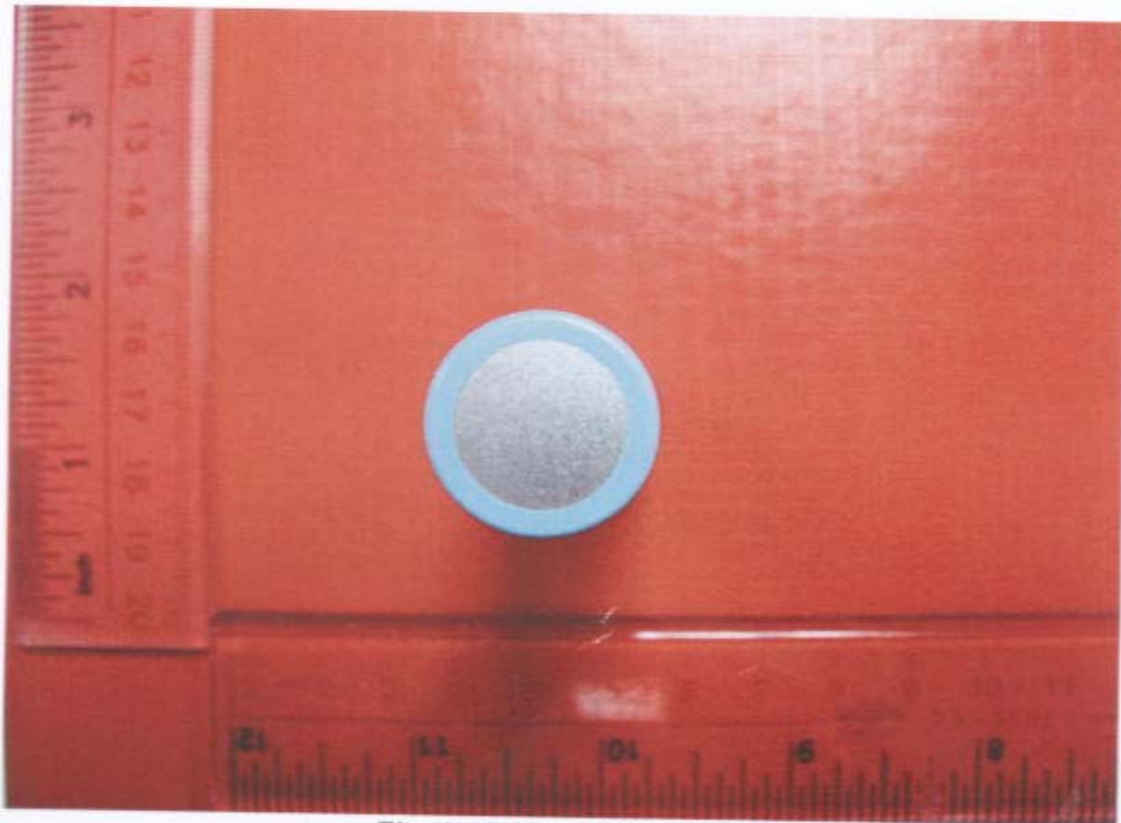


Fig. 3- Bottom Overview



Fig. 4- Front View of remove insulation



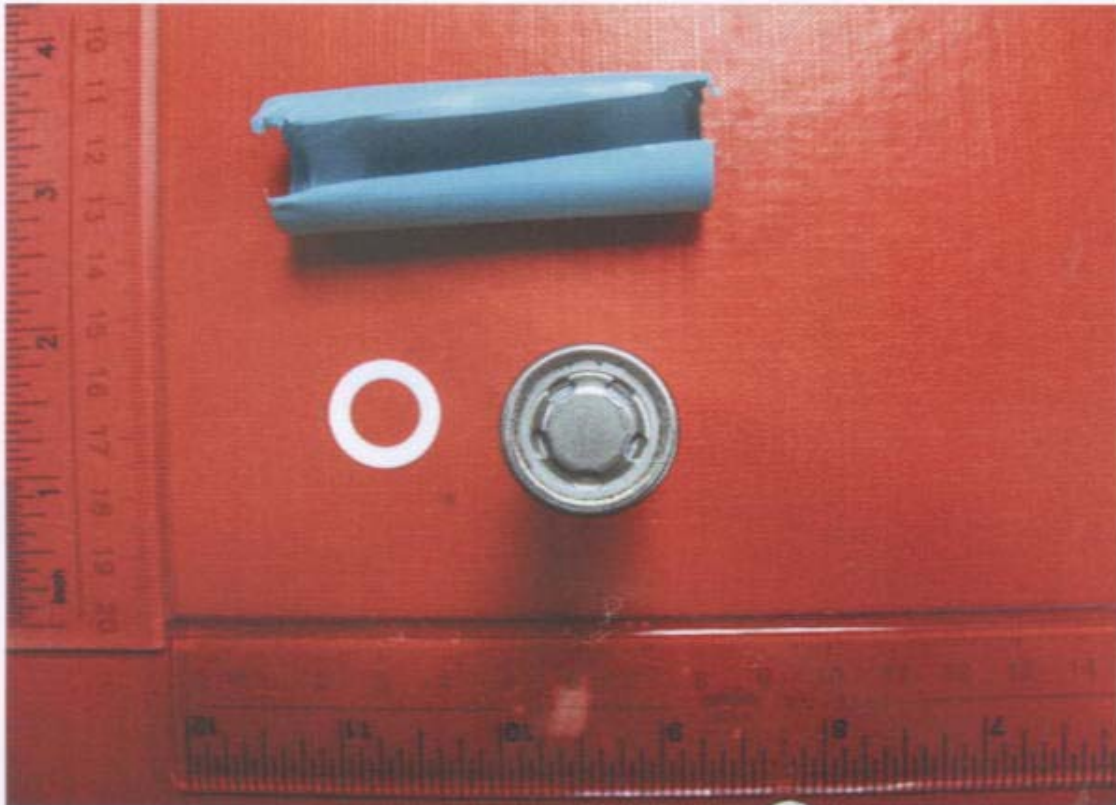


Fig. 5- Top view of remove insulation

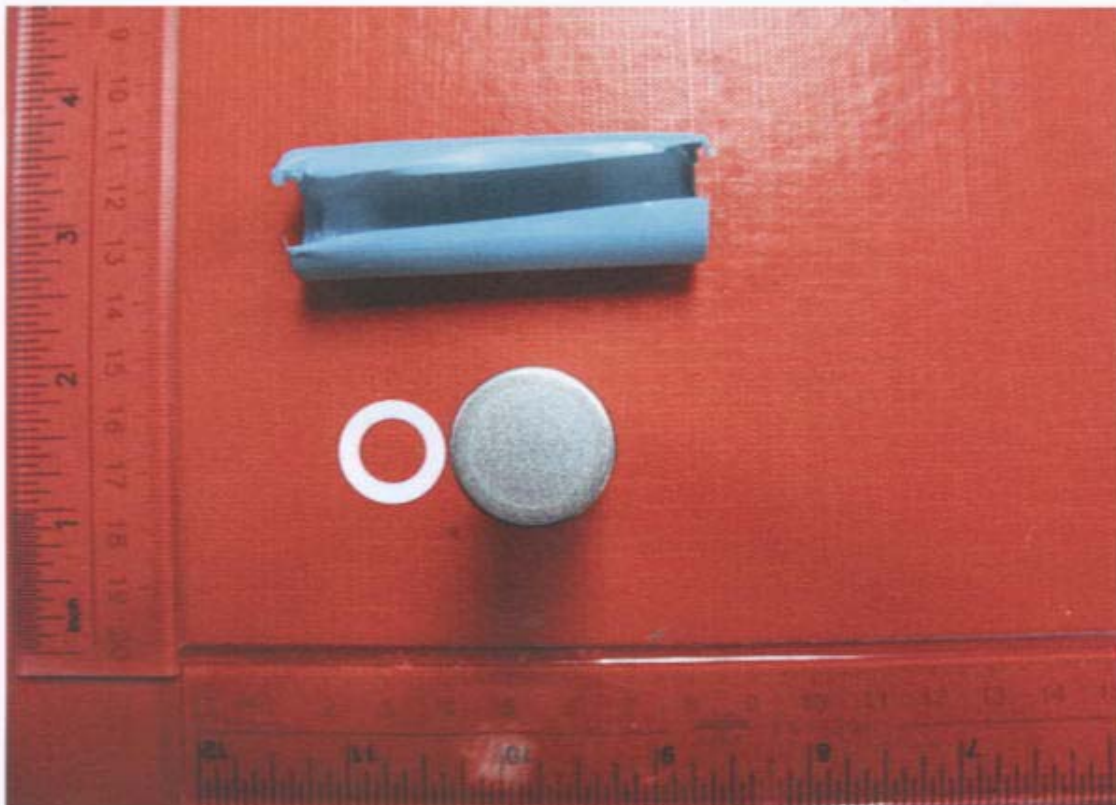


Fig. 6- Bottom view of remove insulation