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Vol 3

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FOLLOW-UP SERVICE PROCEDURE
(TYPE R)

COMPONENT - LITHIUM BATTERIES
(BBCV2)

Manufacturer: SEE ADDENDUM FOR MANUFACTURER LOCATIONS

Applicant: 125751 (Party Site)
GLOBTEK INC
(578908-003) 186 VETERANS DR
NORTHVALE NJ 07647

Recognized Company: 125751 (Party Site)
SAME AS APPLICANT
(578908-003)

This Follow-Up Service Procedure authorizes the above Manufacturer(s) to use the marking specified by UL LLC, or any authorized licensee of UL LLC, including the UL Contracting Party, only on products when constructed, tested and found to be in compliance with the requirements of this Follow-Up Service Procedure and in accordance with the terms of the applicable service agreement with UL Contracting Party and any applicable Service Terms. The UL Contracting Party for Follow-Up Services is listed on addendum to this Follow-Up Service Procedure ("UL Contracting Party"). UL Contracting Party and UL LLC are referred to jointly herein as "UL."

UL further defines responsibilities, duties and requirements for both Manufacturers and UL representatives in the document titled, "UL Mark Surveillance Requirements" that can be located at the following web-site: <http://www.ul.com/fus> and in the document titled "UL and Subscriber Responsibilities" that can be located at the following website: <http://www.ul.com/responsibilities>. Manufacturers without Internet access may obtain the current version of these documents from their local UL customer service representative or UL field representative. For assistance, or to obtain a paper copy of these documents or the applicable Service Terms, please contact UL's Customer Service at <http://www.ul.com/global/eng/pages/corporate/contactus>, select a location and enter your request, or call the number listed for that location.

The Applicant, the specified Manufacturer(s) and any Recognized Company in this Follow-Up Service Procedure must agree to receive Follow-Up Services from UL Contracting Party. If your applicable agreement is a Global Services Agreement ("GSA") with an effective date of January 1, 2012 or later and this Follow-Up Service Procedure is issued on or after that effective date, the Applicant, the specified Manufacturer(s) and any Recognized Company will be bound to a Service Agreement for Follow-Up Services upon the earliest by any Subscriber of use of the prescribed UL Mark, acceptance of the factory inspection, or payment of the Follow-Up Service fees which will incorporate such GSA, this Follow-Up Service Procedure and the Follow-Up Service Terms which can be accessed by clicking here: <http://www.ul.com/contracts/Terms-After-12-31-2011>. In all other events, Follow-Up Services will be governed by and incorporate the terms of your applicable service agreement and this Follow-Up Service Procedure.

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This Follow-Up Service Procedure contains information for the use of the above Manufacturer(s) and representatives of UL and is not to be used for any other purpose. It is provided to the Manufacturer with the understanding that it will be returned upon request and is not to be copied in whole or in part.

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Capitalized terms used but not defined herein have the meanings set forth in the GSA and the applicable Service Terms or any other applicable UL service agreement.

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UL LLC has signed below solely in its capacity as the accredited entity to indicate that this Follow-Up Service Procedure is in compliance with the accreditation requirements.

William R. Carney
Director
North American Certification Program

Recognized Component Marking Data Page (RCMDP)

(FILE IMMEDIATELY AFTER AUTHORIZATION PAGE)

RECOGNIZED COMPONENT MARKING

Products Recognized under UL's Component Recognition Service are identified by marking elements consisting of:

1. The Recognized Company's identification specified in this document.
2. A catalog, model or other applicable product designation specified in the descriptive sections of this document.
3. The UL Recognized Component Mark shown below.

Only those components, which actually bear the Marking, should be considered as being covered under the Recognition Program. The UL Listing or Classification Mark is not authorized for use on or in connection with Recognized Components.

Recognized Component Mark



Minimum size of the Recognized Component Mark is not specified as long as it is legible. Minimum height of the registered symbol ® shall be 3/64 inch but may be omitted if it is out of proportion to the Recognized Component Mark or not legible to the naked eye.

The manufacturer may reproduce the Mark electronically. Any decision regarding the acceptability of the manufacturer's Mark reproduction will be made at the Reviewing Office.

ModelsSection Report Date

GP602065, GP403040, GP453040, GP603040, GP413443,
GP563496, GP404255, GP1003450, GP383562, GP503759,
GP724040, GP903852, GP925050, GP654086, GP5440104,
GP6050100, GP4345135, GP455068, GP525068, GP325385,
GP456074, GP606168, GP4265125, GP5449118, GP6560106,
GP823456, GP502030, GP583475, GP604570, GP753465,
GP482970, GP454362, GP438384, GP4575100, GP383450,
GP705573, GP503450, GP621738, GP452050, GP453038,
GP622535, GP503048, GP603443, GP553437, GP822855,
GP455085, GP844858, GP804969, GP925060, GP925176,
GP835085, GP596193, GP322970, GP803040, GP423382,
GP554858, GP634070, GP784863, GP3565120, GP457590,
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GP696483, GP905385

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APPENDIX A - FIELD REPRESENTATIVE'S RESPONSIBILITIES AND INSTRUCTIONS FOR EXAMINATION OF THE PRODUCT

GENERAL

The Field Representative's general responsibilities, as part of the Follow-Up Services Procedure, are as noted in the published document titled, "UL Mark Surveillance Requirements", and is available through UL's secure customer portal MyHome@UL.com and/or through UL's internet site www.UL.com. Manufacturers that do not have Internet access may obtain the current version of these requirements from their local UL Customer Service Representative or UL Field Representative.

PROCEDURE IN THE EVENT OF NONCONFORMANCE

When a product does not comply with the Follow-Up Service Procedure, require that the manufacturer implement appropriate action as outlined in the "UL Variation Notice and Corrective Action Requirements" document, which can be found at www.ul.com/fus.

INSTRUCTIONS FOR INSPECTION OF THE PRODUCT

General -

The following are applicable only to secondary cells.

There are two types of factory Follow-Up Programs that apply to the BBCV2 Product Category for secondary lithium battery cells. One type relies on the verification of critical dimensions and/or specifications contained in detailed drawings, specification sheets, and/or the FUS Procedure (in lieu of required factory testing). The other relies on required factory testing (in lieu of verification of critical dimensions and/or specifications contained in detailed drawings/specification sheets, and/or the FUS Procedure). Follow-Up Testing at UL is applicable to both Follow-Up Programs.

Cell Models Relying Upon Required Factory Testing -

They are models that are specified in Table D of Sp. App. D.

No special instructions beyond those already contained in the Appendix Pages, Special Appendix Pages, or the body of the FUS Procedure.

Cell Models Relying Upon Verification of Critical Dimensions and/or Specifications -

They are models that are not specified in Table D of Sp. App. D.

The Field Representative shall examine the construction from the information provided in the construction details outlined in the FUS Procedure. If the FUS Procedure referenced drawings and/or specification sheets are not physically

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contained in the FUS Procedure, they will be referenced by drawing/specification sheet number and last revision date. The Field Representative shall use the manufacturer's copies of the drawings and/or specification sheets to conduct the inspection. If requested by the UL Office, the Field Representative shall provide information from the FUS Procedure referenced drawing or specification sheet in use at the time of the visit.

In addition to the information outlined in the electrode and electrolyte items of the product description section of the FUS Procedure, the following information shall be checked on each visit for each product inspected.

1. Positive (Cathode) and Negative (Anode) Electrode(s): A generic description of the active materials, a description of the substrate materials, the overall dimensions of the electrode and the ratio of the negative to positive electrode capacity per area. See Ill 1 for an example of the critical information required for inspection.

Changes to the active material or substrate materials, a change in the dimensions of the electrode or a change in the manufacturer's specifications for the ratio of the negative to positive electrode capacity per area would necessitate a re-evaluation by UL. For changes in other areas contained in the FUS Procedure referenced drawing or specification sheet, it is not necessary for the manufacturer to have the FUS Procedure changed to incorporate the latest revision level/date. However, you shall work with the manufacturer to preserve the critical information contained on the document referenced in the FUS Procedure so that it could be used during subsequent inspections to determine that critical information contained on documents with newer revision levels/dates has not changed.

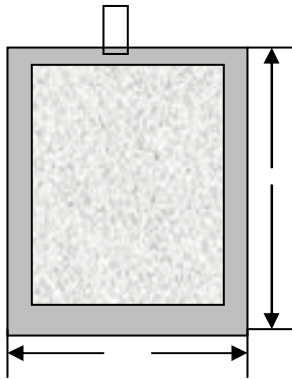
2. Electrolyte(s): The lithium salts and their percentage of the total electrolyte composition, the solvents and their percentage of the total electrolyte composition, a description of allowed contaminants and maximum levels allowed. See Ill 2 for an example of the critical information required for inspection.

Changes to the lithium salt composition or in its percentage of the total electrolyte composition, in the solvent(s) used or in each solvent's percentage of the total electrolyte composition, an increase of the current maximum allowed contaminant levels or the addition of new allowed contaminants would necessitate a re-evaluation by UL. For changes in other areas contained in the FUS Procedure referenced drawing or specification sheet, it is not necessary for the manufacturer to have the FUS Procedure changed to incorporate the latest revision level/date. However, you shall work with the manufacturer to preserve the critical information contained on the document referenced in the FUS Procedure so that it could be used during subsequent inspections to determine that critical information contained on documents with newer revision levels/dates has not changed.

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ILLUSTRATION 1: ELECTRODE INFORMATION
(Example)

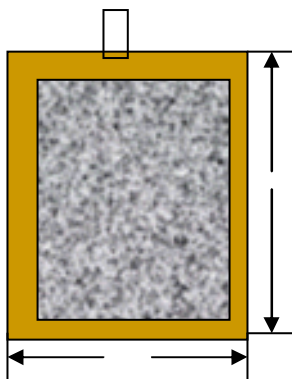
- 1. Drawing Number and Revision date
- 2. The capacity ratio of the negative (anode) to positive (cathode) electrodes: i.e. ≥ 1.008
- 3. Positive Electrode Information:



Overall Dimensions of Positive Electrode

Positive Electrode Active Materials: i.e. LiCoO_2 , LiCoMnNiO_2 , etc.
Positive Electrode Substrate Material: i.e. aluminum foil

- 4. Negative Electrode Information:



Overall Dimensions of Negative Electrode

Negative Electrode Active Materials: i.e. graphite, carbon, etc.
Negative Electrode Substrate Material: i.e. copper foil

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

ILLUSTRATION 2: ELECTROLYTE INFORMATION
(Example)

1. Drawing number and revision date
2. Lithium Salts: *i.e. LiPF₆, LiBF₄, LiClO₄, etc.*
Lithium salt - weight % of composition: *i.e. 13.2 ± 0.3 %*
3. Solvent(s) (typically more than one): *i.e. EC, PC, DMC, EMC, EA, MA*
For each solvent - weight % of composition: *i.e. 10.0 ± 1.0 %*
4. Allowed Impurities: *i.e. H₂O, HF, Fe, Na, K, Ca, etc.*
Maximum impurity levels: *i.e. 4 ppm,*

Electrolyte Drawing # ABC Revision Date: 12/1/07	
Lithium Salt	Weight percentage
LiPF ₆	13.2 ± 0.3 %
Solvent(s)	Weight Percentage
EC	30.2 ± 1.0 %
DC	28.1 ± 1.0 %
DMC	27.3 ± 1.0 %
Allowed Impurities	Maximum Allowed Levels, ppm
H ₂ O	18
HF	35
FE	4
Na	4
K	4

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

APPENDIX B - INSTRUCTIONS FOR FIELD REPRESENTATIVE'S SAMPLE SELECTION

GENERAL

Certain products covered by this Procedure employ constructions or materials requiring Follow-Up Tests to be conducted at UL.

Referring to Sp. App. B, Table B. Within each calendar year and for each sample group, select either the number of cells or separator materials indicated in the No. Per Group Per Year (#/Group/Year) column, or the number in that group which are available during inspection visits, whichever is lesser.

Unless specifically requested, a cell or separator material, shall only be selected once each year.

If it is not possible to select the required number of cells or separator materials for a given calendar year due to production schedules, continue with the sample selection per Sp. App. B, Table B when inspection visits resume the following year. Do not select multiple samples of the same cell or separator material to fulfill the #/Group/Year requirement.

SAMPLES FOR THE TESTING OFFICE

The Field Representative is responsible for selecting the appropriate cells and/or separator materials for Follow-Up testing as indicated above. For each cell or separator material selected, the sample requirements and FUS Test Program are indicated in code, in the Test Program Code column in Sp. App. B, Table B. Specific details regarding the Test Program Codes are contained in Table A below, including quantity of samples, size, thickness, and the required test program.

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

TABLE A - SAMPLES AND TEST PROGRAMS

Test Program Code	Samples Required	Required FUS Sample Tests
A	1 cell sample	Open Circuit Voltage Measurement
B	11 cell samples	Open Circuit Voltage Measurement
		Projectile Test
C	5 cell samples	Abnormal Charging Test
D	15 cell samples	Abnormal Charging Test
		Projectile Test
E	A piece of 60 x 200 mm separator material	Separator ID Test: IR
		Separator ID Test: TGA
		Separator ID Test: DSC
F	A length of 100 cm separator material in the machine direction, i.e. along the length of the material as it is unrolled	Separator Thickness Test
G	3 cell samples employing the separator material	Disassembly of Separator
		Separator ID Test: IR
		Separator ID Test: TGA
		Separator ID Test: DSC
		Separator Thickness Test

Samples shall be identified and tagged with the applicable information using a Sample Tag (Form 3000-217). Unless otherwise stated, the Field Representative shall inform the manufacturer that the samples are to be forwarded to the Test Office(s) as designated on the specific Procedure Volume subscriber card.

Cells Samples -

The following additional information of the cells shall be included on the Sample Tag:

Primary and Secondary cells:

- Manufacturer's Name and Model Number
- Rated Voltage in Vdc (include tolerances if applicable)
- Rated Capacity in Ah

Secondary cells only:

- Manufacturer's specified discharge end point voltage in Vdc
- Manufacturer's maximum specified charge current, I_c , in mA
- Manufacturer's maximum specified charge voltage, V_c , in Vdc
- Manufacturer's specified charging parameters for "topping off" samples including the cut off current

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

Separator Material Samples:

The following additional information of the separator material shall be included on the Sample Tag:

- Separator ID/Part number
- The cell model number in which the material is used

In the special circumstance that individual separator samples cannot be shipped for testing, complete cells as indicated in Table B may be selected and sent instead. The Sample Tag of the cells samples shall be marked with:

- the cell manufacturer's name
- the cell model number
- the cell capacity

Note: Because of the way lithium ion polymer cells are constructed, the option of sending whole cell samples for separator testing is not offered, and actual separator samples as noted above must be sent.

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

APPENDIX C - INSTRUCTIONS FOR FOLLOW-UP TESTS AT UL

GENERAL

The samples selected in accordance with Appendix B shall be subjected to the tests indicated in Table B of Sp. App. B for the specific product. Tests are to be conducted in accordance with the current Standard for Lithium Batteries, UL 1642.

CELL TESTS

The following cell tests shall be conducted as specified in Table B of Sp. App. B on samples received.

OPEN CIRCUIT VOLTAGE MEASUREMENT (PRIMARY CELLS ONLY):

METHOD

The open circuit voltage for one sample of each primary model cell and battery was measured using a direct-current (dc) voltmeter and compared to its specified open circuit voltage as indicated in Table C of Sp. App. C.

BASIS FOR ACCEPTABILITY

The measured voltage of the battery was within the tolerances of the manufacturer's specified open circuit voltage.

ABNORMAL CHARGING (SECONDARY CELLS ONLY):

METHOD

Five samples of each model shall be tested in an ambient temperature of $20 \pm 5^\circ\text{C}$. Temperatures are monitored, for information purposes only, on cell casings using thermocouples.

Samples subjected to this test shall be charged to the top off parameters outlined in Table C of Sp. App. C.

Each fully charged sample is discharged at a constant current of $0.2C/1\text{ h}$ to the manufacturer's maximum specified discharge endpoint voltage per Table C of Sp. App. C.

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ABNORMAL CHARGING (SECONDARY CELLS ONLY): (CONT'D)

The sample is then charged with a constant current (CC) charging method with a maximum target charging current limit which is 3 times the manufacturer's maximum specified charging current, I_c , until the manufacturer's specified maximum charging voltage, as noted in the Table C of Sp. App. C is reached. At that point the charging method is changed to a constant voltage (CV) charging method at the manufacturer's specified maximum charging voltage, as noted in Table C of Sp. App. C.

Testing is conducted on at least two samples at a charge current equal to 1.5 times the manufacturer's maximum specified charging current, I_c .

The charge duration is 7 hours.

BASIS FOR ACCEPTABILITY

The samples shall not explode or catch fire as a result of the abnormal charge test.

PROJECTILE: (PRIMARY AND SECONDARY CELLS)

METHOD

Five of the 10 fully charged samples of each model selected are subjected to this test. Secondary cells are charged in accordance with the top off parameters of Table C of Sp. App. C under abnormal charging before being subjected to the projectile test.

As shown in Fig. 1, each test sample cell is placed on a screen that covers a 102 mm (4 inch) diameter hole in the center of a platform table. The screen is constructed of steel wire mesh having 20 openings per inch (25.4mm) and a wire diameter of 0.017 in. (0.43mm). The screen is mounted 38mm (1-1/2 inch) above a burner. The fuel and airflow ratios are set to provide a bright blue flame that causes the supporting screen to glow a bright red.

An eight-sided covered wire cage, 610 mm (2 feet) across and 305 mm (1 foot) high, made from metal screening is placed over the test sample as shown in Figure 1. The metal screening is constructed from 0.25mm (0.010 inch) diameter aluminum wire with 16-18 wires per inch (25.4mm) in each direction. The aluminum screening should be free from holes and secured tautly around the frame.

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

PROJECTILE: (PRIMARY AND SECONDARY CELLS) (CONT'D)

Each sample is heated and shall remain on the screen until it explodes or the cell has ignited and burned out. It is not required to secure the sample in place unless it is at risk of falling off the screen before the test is completed. When required, the sample shall be secured to the screen with a single wire tied around the sample.

Note: The securement wire is only utilized if the sample will not remain above the flame during the test to achieve ultimate results. In this case the single wire utilized should be the minimal thickness necessary to hold the cell in place.

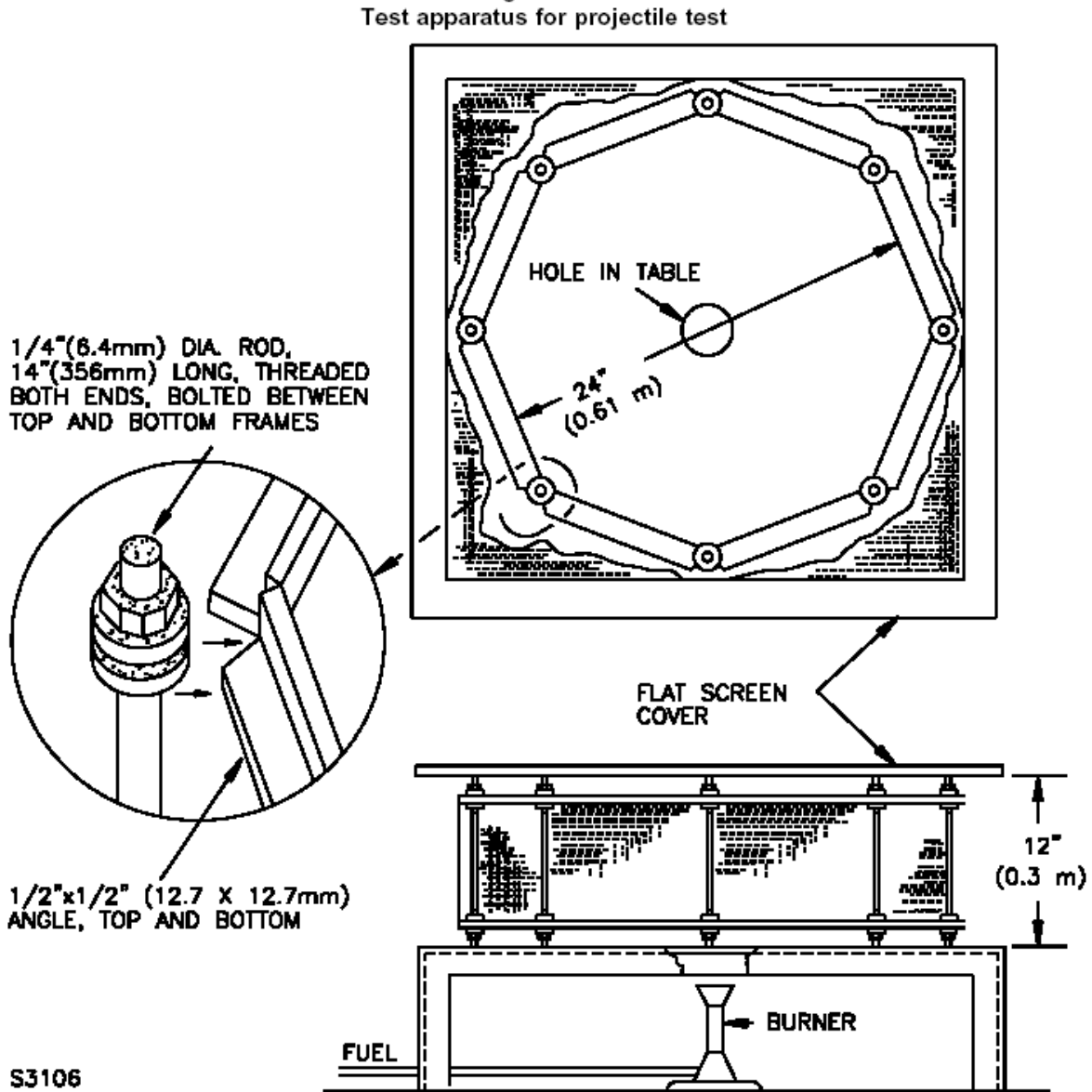
BASIS FOR ACCEPTABILITY

No part of an exploding cell shall penetrate the aluminum wire screen.

Note: A hole in the screen created by a piece of the cell sitting on the screen and burning a hole through the screen is not considered a failing result. Only those holes created by exploding parts puncturing the screen due to the force of the explosion are considered failing results.

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

FIG. 1



COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

SEPARATOR MATERIAL TESTS:

The following tests shall be conducted on samples of separator selected in accordance with Table B of Sp. App. B.

For special circumstances, when cells must be shipped in lieu of separator samples, special additional sample preparation must be followed as outlined under Preparation of Samples Obtained From Cells.

PREPARATION OF SAMPLES OBTAINED FROM CELLS

Cells provided for separator tests, shall be fully discharged at a 1C rate until they are completely discharged (@ 0.2Vdc open circuit voltage). The cells shall be carefully disassembled in a sample preparation area taking care to prevent damage to the electrode assembly. The electrode assembly shall be unwound, or disassembled and a sufficient quantity of separator material as outlined in Table B of Sp. App. B under Test Program Codes G, is to be removed from the electrodes for testing.

The separator sample(s) shall then be soaked in a suitable cleaning solvent (i.e. acetone) to remove active material and/or electrolyte residue for 24 hours, and allowed to air dry in a clean chamber prior to conducting the separator material ID and thickness measurement as noted below.

SEPARATOR MATERIAL ID TESTS

GENERAL

The Qualitative Infrared Analysis (IR), Differential Scanning Calorimetry (DSC), and Thermogravimetric Analysis (TGA) Tests are to be conducted in accordance with the current Standard for Polymeric Materials Short Term Property Evaluations (UL 746A).

CONDITIONING

Prior to material ID testing, the samples shall be conditioned in an atmosphere of 50.0 ±2.0% RH and 23.0 ±1.0°C for a minimum of 40 hours.

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

A. QUALITATIVE INFRARED ANALYSIS

METHOD

The separator sample(s) shall be subjected to the Qualitative Infrared Analysis (IR) test and comply with the Basis for Acceptability.

An infrared spectrum of the material shall be obtained using an infrared spectrophotometer.

BASIS FOR ACCEPTABILITY

The test spectrum shall correlate with the spectrum referenced on Special Table C of Sp. App. C.

B. DIFFERENTIAL SCANNING CALORIMETRY

METHOD

The separator sample(s) shall be subjected to the Differential Scanning Calorimetry (DSC) Test and shall comply with the Basis for Acceptability below.

BASIS FOR ACCEPTABILITY

The test thermogram shall indicate the same thermal response over the programmed temperature range as that referenced in Table C of Sp. App. C.

C. THERMOGRAVIMETRY

METHOD

The separator sample(s) shall be subjected to the Thermogravimetry (TGA) Test and shall comply with the Basis for Acceptability.

BASIS OF ACCEPTABILITY

The thermogram obtained shall indicate the same characteristic weight loss over the programmed temperature range as referenced in Table C of Sp. App. C.

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

D. THICKNESS MEASUREMENT

METHOD

The separator thickness is determined by utilizing an instrument designed for measuring easily deformed work pieces at thicknesses in the 10 - 30 μm range. The measuring instrument shall be adjusted so that a force of 0.01N (1 gram-force) is placed on the sample when measuring the thickness.

The thickness of the sample is measured every 20 cm in the machine direction of the sample for a total of 5 measurements. The thickness of the sample is calculated as the average of the 5 measurements. The thickness value obtained shall be compared with the value noted in Table B of Sp. App. B.

BASIS OF ACCEPTABILITY

The separator thickness shall be within the thickness measurement tolerances as noted in Table B of Sp. App. B.

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

APPENDIX D - MANUFACTURER' S RESPONSIBILITIES, CONSTRUCTION CONSIDERATIONS, AND REQUIREMENTS FOR FACTORY TESTS

The Follow-Up Service Procedure covering the product is loaned to the manufacturer and constitutes the basis on which the product is judged for compliance with the applicable requirements.

GENERAL

The Manufacturer's general responsibilities, as part of the Follow-Up Services Procedure, are as noted in the published document titled, "UL Mark Surveillance Requirements", and is available through UL's secure customer portal MyHome@UL.com and/or through UL's internet site www.UL.com. Manufacturers that do not have Internet access may obtain the current version of these requirements from their local UL Customer Service Representative or UL Field Representative.

MANUFACTURER' S RESPONSIBILITIES

Specific manufacturer's responsibilities include, but are not limited to:

Production Tests - For those models indicating in Table D of Sp. App. D, conduct the Factory Tests detailed in Appendix D.

Required Records - Maintain records of test performance. Unless indicated otherwise in the Procedure, the information to be recorded should include the model or catalog number, identification of the product, the test conducted, the test date, and the results. Records are to be retained for at least 6 months and shall be readily available for review by the Field Representative.

Note: It is not necessary to keep complete test records when 100% of production is tested, if the manufacturer has an auditable system in place to confirm that production is always subjected to the required tests. Instead, exception reports indicating noncompliance and corrective action should be retained.

Markings - The cells shall be marked with the manufacturer's name, trademark or other identifier; cell part number; date of manufacturer; and as outlined in the Section General and individual procedures.

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

CONSTRUCTION CONSIDERATIONS

For those cases where the Follow-Up Service is based upon verification of critical dimensions and/or specifications, it is recognized that the manufacturer may change dimensions and/or specifications (therefore changing revision levels) for parameters not specified in the FUS Procedure. It is acceptable for the manufacturer to do so without seeking a change to the FUS Procedure as long as he still retains a copy of the FUS Procedure referenced drawing, so the Field Representative during subsequent visits can continue to confirm that the latter revision levels do not include any changes to the dimensions and/or specifications for parameters referenced by the FUS Procedure. Any changes to dimensions and/or specifications for parameters covered in the FUS Procedure must first be authorized by UL and the latest version (revision level) of the drawing must be incorporated in the FUS Procedure.

MANUFACTURER'S PERIODIC PRODUCTION TEST PROGRAM FOR SECONDARY CELLS

For cell models subjected to periodic production testing, refer to Table D of Sp. App. D.

The applicable tests and examinations described below shall be performed by the manufacturer on random samples chosen in accordance with Table E below.

TABLE E - FREQUENCY OF PERIODIC PRODUCTION TESTS

Test or Examination	Type of Product	Frequency
Weight Measurement	Lithium ion and lithium ion polymer cells	Daily
Upper Discharge Profiles	Lithium ion and lithium ion polymer cells	Monthly
Lower Discharge Profile	Lithium ion and lithium ion polymer cells	Monthly
Leakage	Lithium ion and lithium ion polymer cells	Monthly
X-Ray Construction Examination	Lithium ion and lithium ion polymer cells	Monthly

A. Weight Test

Test Method

Using a calibrated scale, a representative sample of production cells from each model as outlined in Table 1 of Sp. App. D shall be weighed and compared with the manufacturer's specified weight.

Basis for Acceptability

The weight of samples shall be within the tolerances per Table 1 of Sp. App. D.

STANDARDIZED APPENDIX PAGE (SAP)

Controlled Document: Direct Request for Revision to PDE for Category

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

B. Upper Discharge Profile

Test Method

A representative sample of production cells as outlined in Table 2 of Sp. App. D from each model shall be subjected to a 1.0C Discharge Profile Production Test. Cells intended for high rate discharge applications greater than 1.0C, shall be subjected to a higher discharge profile as outlined in Table 2.

Samples shall be fully charged in accordance with the manufacturer's specifications for charging. The samples shall then be discharged at a 1.0C A discharge rate, or higher rate as applicable, at an ambient of $20 \pm 5^{\circ}\text{C}$ to the manufacturers specified end point voltage. The voltage over current discharge profiles shall be recorded during discharging of the cell. The curves obtained shall be compared with the manufacturers specified discharge profile for the cell.

Basis of Acceptability

The discharge voltage over current profile shall be within the manufacturer's specification tolerances per Table 2 of Sp. App. D.

C. Lower Discharge Profile

Test Method

A representative sample of production cells as outlined in Table 2 of Sp. App. D from each model shall be subjected to a 0.2C Discharge Profile Production Test. Cells intended for high rate discharge applications greater than 1.0C, shall be subjected to a low discharge profile at higher rates than 0.2C, as outlined in Table 2.

Samples shall be fully charged in accordance with the manufacturer's specifications for charging. The samples shall then be discharged at a 0.2C A discharge rate, or higher rate as applicable, at an ambient of $20 \pm 5^{\circ}\text{C}$ to the manufacturers specified end point voltage. The voltage over current discharge profiles shall be recorded during discharging of the cell. The curves obtained shall be compared with the manufacturers specified discharge profile for the cell.

Basis of Acceptability

The discharge voltage over current profile shall match the manufacturer's specification tolerances per Table 2 of Sp. App. D.

STANDARDIZED APPENDIX PAGE (SAP)

Controlled Document: Direct Request for Revision to PDE for Category

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

D. Leakage

Test Method

A representative sample of production cells as outlined in Table 3 of Sp. App. D from each model shall be subjected to a Leakage Test.

Samples fully charged in accordance with the manufacturer's specifications, shall be subjected to conditioning at $60 \pm 2^\circ\text{C}$ for 20 days.

At the conclusion of the conditioning, the cells shall be allowed to return to room ambient ($20 \pm 5^\circ\text{C}$) and examined for visual signs of leakage of electrolyte.

Basis of Acceptability

There shall be no signs of leakage.

E. X-Ray Construction Review

Test Method

A representative sample of production cells as outlined in Table 4 of Sp. App. D from each model shall be subjected to an X-Ray Construction Review as outlined below.

Samples shall be X-rayed utilizing equipment as outlined in Table F in Sp. App. D. The X-rays of the chosen production test samples shall be compared with the manufacturer's comparison X-Ray of the cell model to determine that construction features such the placement and size of the electrodes, length of center tube, tab placement and design, etc. have not changed from the manufacturer's X-ray Construction Review.

Basis of Acceptability

The X-rays of the examined production samples shall be comparable with the manufacturer's X-Ray Construction Review. There shall be no signs of change.

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

Procedure In Case of Nonconforming Results

When nonconformance is encountered during the manufacturer's test and inspection program, the manufacturer shall follow the procedure detailed below:

- a. Reject the lot and hold production since last acceptable sample.
- b. Perform analysis to determine cause of nonconformance, corrective action to be taken, and portion of segregated production or lots affected.
- c. Implement corrective action.
- d. Randomly select a minimum of verification samples in accordance with parameters tables in Sp. App. D for retest of nonconforming parameters.
- e. If all verification samples pass, the lot may be accepted.
- f. If any verification sample does not conform, all reference to UL may be removed from the affected production, the production may be scrapped entirely or, the manufacturer may notify the Field Representative of the nonconformance and a Special Investigation shall be initiated by the manufacturer. The Special Investigation shall be concluded and the segregated production may bear the UL Listing Mark only when, in the judgment of UL, the conditions responsible for the Special Investigation have been corrected.

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

Table B - SAMPLE SELECTION GUIDE

Sample Group	#/Group /Year	Model #	Report Date	Category	Type of Cells	Cell capacity (C) mAh	Thickness (µm)	Additional Info	Test Program Code
1	0	*							
2	17	GP1003450	2011-09-08	Secondary	Pouch	1700	NA	-	D
		GP322970	2011-09-08	Secondary	Pouch	550	-	#To be determined during FUS testing.	D, G
		GP325385	2011-09-08	Secondary	Pouch	1500	NA	-	D
		GP3565120	2011-09-08	Secondary	Pouch	3000	-	#To be determined during FUS testing.	D, G
		GP3581117	2011-09-08	Secondary	Pouch	4000	-	#To be determined during FUS testing.	D, G
		GP3660165	2011-09-08	Secondary	Pouch	4000	-	#To be determined during FUS testing.	D, G
		GP383450	2011-09-08	Secondary	Pouch	650	NA	-	D
		GP383562	2011-09-08	Secondary	Pouch	820	NA	-	D
		GP403040	2011-09-08	Secondary	Pouch	340	NA	-	D
		GP404255	2011-09-08	Secondary	Pouch	1000	NA	-	D
		GP413443	2011-09-08	Secondary	Pouch	560	NA	-	D
		GP423382	2011-09-08	Secondary	Pouch	1400	-	#To be determined during FUS testing.	D, G
		GP4265125	2011-09-08	Secondary	Pouch	3200	NA	-	D
		GP4345135	2011-09-08	Secondary	Pouch	3200	NA	-	D
		GP438384	2011-09-08	Secondary	Pouch	3400	NA	-	D
		GP452050	2011-09-08	Secondary	Pouch	400	NA	-	D
		GP453038	2011-09-08	Secondary	Pouch	450	NA	-	D
GP453040	2011-09-08	Secondary	Pouch	490	NA	-	D		
GP454362	2011-09-08	Secondary	Pouch	1300	NA	-	D		
GP455068	2011-09-08	Secondary	Pouch	1600	NA	-	D		
GP455085	2011-09-08	Secondary	Pouch	2200	NA	-	D		

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

Table B - SAMPLE SELECTION GUIDE

Sample Group	#/Group /Year	Model #	Report Date	Category	Type of Cells	Cell capacity (C) mAh	Thickness (µm)	Additional Info	Test Program Code
		GP456074	2011-09-08	Secondary	Pouch	1950	NA	-	D
		GP4575100	2011-09-08	Secondary	Pouch	4000	NA	-	D
		GP457590	2011-09-08	Secondary	Pouch	3500	-	#To be determined during FUS testing.	D, G
		GP482970	2011-09-08	Secondary	Pouch	1100	NA	-	D
		GP502030	2011-09-08	Secondary	Pouch	250	NA	-	D
		GP503048	2011-09-08	Secondary	Pouch	750	NA	-	D
		GP503450	2011-09-08	Secondary	Pouch	900	NA	-	D
		GP503759	2011-09-08	Secondary	Pouch	1050	NA	-	D
		GP525068	2011-09-08	Secondary	Pouch	1800	NA	-	D
		GP5440104	2011-09-08	Secondary	Pouch	2400	NA	-	D
		GP5449118	2011-09-08	Secondary	Pouch	3200	NA	-	D
		GP553437	2011-09-08	Secondary	Pouch	650	NA	-	D
		GP554858	2011-09-08	Secondary	Pouch	1950	-	#To be determined during FUS testing.	D, G
		GP563496	2011-09-08	Secondary	Pouch	1900	NA	-	D
		GP583475	2011-09-08	Secondary	Pouch	1600	NA	-	D
		GP596193	2011-09-08	Secondary	Pouch	4200	NA	-	D
		GP602065	2011-09-08	Secondary	Pouch	740	NA	-	D
		GP603040	2011-09-08	Secondary	Pouch	680	NA	-	D
		GP603443	2011-09-08	Secondary	Pouch	800	NA	-	D
		GP604570	2011-09-08	Secondary	Pouch	2100	NA	-	D
		GP6050100	2011-09-08	Secondary	Pouch	3000	NA	-	D
		GP606168	2011-09-08	Secondary	Pouch	2600	NA	-	D
		GP607080	2011-09-08	Secondary	Pouch	3800	-	#To be determined during FUS testing.	D, G
		GP621738	2011-09-08	Secondary	Pouch	390	NA	-	D
		GP622535	2011-09-08	Secondary	Pouch	500	NA	-	D

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

Table B - SAMPLE SELECTION GUIDE

Sample Group	#/Group /Year	Model #	Report Date	Category	Type of Cells	Cell capacity (C) mAh	Thickness (µm)	Additional Info	Test Program Code
		GP634070	2011-09-08	Secondary	Pouch	2000	-	#To be determined during FUS testing.	D, G
		GP654086	2011-09-08	Secondary	Pouch	2100	NA	-	D
		GP6560106	2011-09-08	Secondary	Pouch	4000	NA	-	D
		GP696483	2011-09-08	Secondary	Pouch	4500	-	#To be determined during FUS testing.	D, G
		GP705573	2011-09-08	Secondary	Pouch	3000	NA	-	D
		GP724040	2011-09-08	Secondary	Pouch	1200	NA	-	D
		GP753465	2011-09-08	Secondary	Pouch	1850	NA	-	D
		GP756074	2011-09-08	Secondary	Pouch	4100	-	#To be determined during FUS testing.	D, G
		GP784863	2011-09-08	Secondary	Pouch	2500	-	#To be determined during FUS testing.	D, G
		GP803040	2011-09-08	Secondary	Pouch	950	-	#To be determined during FUS testing.	D, G
		GP804969	2011-09-08	Secondary	Pouch	3000	NA	-	D
		GP822855	2011-09-08	Secondary	Pouch	1350	NA	-	D
		GP823456	2011-09-08	Secondary	Pouch	1750	NA	-	D
		GP835085	2011-09-08	Secondary	Pouch	4000	NA	-	D
		GP844858	2011-09-08	Secondary	Pouch	2500	NA	-	D
		GP854678	2011-09-08	Secondary	Pouch	3000	-	#To be determined during FUS testing.	D, G
		GP903852	2011-09-08	Secondary	Pouch	1700	NA	-	D

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

Table B - SAMPLE SELECTION GUIDE

Sample Group	#/Group /Year	Model #	Report Date	Category	Type of Cells	Cell capacity (C) mAh	Thickness (µm)	Additional Info	Test Program Code
		GP905385	2011-09-08	Secondary	Pouch	5100	-	#To be determined during FUS testing.	D, G
		GP925050	2011-09-08	Secondary	Pouch	2200	NA	-	D
		GP925060	2011-09-08	Secondary	Pouch	3000	NA	-	D
		GP925176	2011-09-08	Secondary	Pouch	4000	NA	-	D

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

INDEX TO FOOTNOTES:

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

TABLE C - TEST CRITERIA

Refer to Sp. App. B for Footnotes and Table B for Additional Information

Model #	Cell capacity (C) mAh	Open Circuit Voltage, Vdc	Top-off Charge voltage (V _c), Vdc	Top-off Charge current (I _c), mA	End Point/ Cut Off Voltage, Vdc	External Protector Left in Circuit, Y/N?	IR Reference	TGA Reference	DSC Reference
*									
GP1003450	1700	-	4.2	340	3.0	No	-	-	-
GP322970	550	-	4.20	110	3.0	-	#	#	#
GP325385	1500	-	4.2	300	3.0	No	-	-	-
GP3565120	3000	-	4.20	600	3.0	-	#	#	#
GP3581117	4000	-	4.20	800	3.0	-	#	#	#
GP3660165	4000	-	4.20	800	3.0	-	#	#	#
GP383450	650	-	4.2	130	3.0	No	-	-	-
GP383562	820	-	4.2	164	3.0	No	-	-	-
GP403040	340	-	4.2	68	3.0	No	-	-	-
GP404255	1000	-	4.2	200	3.0	No	-	-	-
GP413443	560	-	4.2	112	3.0	No	-	-	-
GP423382	1400	-	4.20	280	3.0	-	#	#	#
GP4265125	3200	-	4.2	640	3.0	No	-	-	-
GP4345135	3200	-	4.2	640	3.0	No	-	-	-
GP438384	3400	-	4.2	680	3.0	No	-	-	-
GP452050	400	-	4.2	80	3	No	-	-	-
GP453038	450	-	4.2	90	3	No	-	-	-
GP453040	490	-	4.2	98	3.0	No	-	-	-
GP454362	1300	-	4.2	260	3.0	No	-	-	-
GP455068	1600	-	4.2	320	3.0	No	-	-	-
GP455085	2200	-	4.2	440	3	No	-	-	-
GP456074	1950	-	4.2	390	3.0	No	-	-	-
GP4575100	4000	-	4.2	800	3.0	No	-	-	-
GP457590	3500	-	4.20	700	3.0	-	#	#	#
GP482970	1100	-	4.2	220	3.0	No	-	-	-
GP502030	250	-	4.2	50	3.0	No	-	-	-

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

TABLE C - TEST CRITERIA

Refer to Sp. App. B for Footnotes and Table B for Additional Information

Model #	Cell capacity (C) mAh	Open Circuit Voltage, Vdc	Top-off Charge voltage (V _c), Vdc	Top-off Charge current (I _c), mA	End Point/ Cut Off Voltage, Vdc	External Protector Left in Circuit, Y/N?	IR Reference	TGA Reference	DSC Reference
GP503048	750	-	4.2	150	3	No	-	-	-
GP503450	900	-	4.2	180	3.0	No	-	-	-
GP503759	1050	-	4.2	210	3.0	No	-	-	-
GP525068	1800	-	4.2	360	3.0	No	-	-	-
GP5440104	2400	-	4.2	480	3.0	No	-	-	-
GP5449118	3200	-	4.2	640	3.0	No	-	-	-
GP553437	650	-	4.2	130	3	No	-	-	-
GP554858	1950	-	4.2	390	3.0	-	#	#	#
GP563496	1900	-	4.2	380	3.0	No	-	-	-
GP583475	1600	-	4.2	320	3.0	No	-	-	-
GP596193	4200	-	4.2	840	3	No	-	-	-
GP602065	740	-	4.2	148	3.0	No	-	-	-
GP603040	680	-	4.2	136	3.0	No	-	-	-
GP603443	800	-	4.2	160	3	No	-	-	-
GP604570	2100	-	4.2	420	3.0	No	-	-	-
GP6050100	3000	-	4.2	600	3.0	No	-	-	-
GP606168	2600	-	4.2	520	3.0	No	-	-	-
GP607080	3800	-	4.20	760	3.0	-	#	#	#
GP621738	390	-	4.2	78	3	No	-	-	-
GP622535	500	-	4.2	100	3	No	-	-	-
GP634070	2000	-	4.20	400	3.0	-	#	#	#
GP654086	2100	-	4.2	420	3.0	No	-	-	-
GP6560106	4000	-	4.2	800	3.0	No	-	-	-
GP696483	4500	-	4.20	900	3.0	-	#	#	#
GP705573	3000	-	4.2	600	3.0	No	-	-	-
GP724040	1200	-	4.2	240	3.0	No	-	-	-
GP753465	1850	-	4.2	370	3.0	No	-	-	-

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

TABLE C - TEST CRITERIA

Refer to Sp. App. B for Footnotes and Table B for Additional Information

Model #	Cell capacity (C) mAh	Open Circuit Voltage, Vdc	Top-off Charge voltage (V _c), Vdc	Top-off Charge current (I _c), mA	End Point/ Cut Off Voltage, Vdc	External Protector Left in Circuit, Y/N?	IR Reference	TGA Reference	DSC Reference
GP756074	4100	-	4.20	820	3.0	-	#	#	#
GP784863	2500	-	4.20	500	3.0	-	#	#	#
GP803040	950	-	4.20	190	3.0	-	#	#	#
GP804969	3000	-	4.2	600	3	No	-	-	-
GP822855	1350	-	4.2	270	3	No	-	-	-
GP823456	1750	-	4.2	350	3.0	No	-	-	-
GP835085	4000	-	4.2	800	3	No	-	-	-
GP844858	2500	-	4.2	500	3	No	-	-	-
GP854678	3000	-	4.20	600	3.0	-	#	#	#
GP903852	1700	-	4.2	340	3.0	No	-	-	-
GP905385	5100	-	4.20	1020	3.0	-	#	#	#
GP925050	2200	-	4.2	440	3.0	No	-	-	-
GP925060	3000	-	4.2	600	3	No	-	-	-
GP925176	4000	-	4.2	800	3	No	-	-	-

TABLE F - TEST EQUIPMENT

The following equipment has been evaluated with respect to the requirements expressed in Appendix D and has been found suitable:

Test	Type of Equipment	Equipment Manufacturer's Name	Equipment Model No.
Weight	N/A		
Upper Discharge	N/A		
Lower Discharge	N/A		
Leakage	N/A		
X-Ray Construction Review	N/A		

TABLE 1
PRODUCTION WEIGHT TEST PARAMETERS

Cell Models	Section No.	No. of Production Samples Tested per Day (≥ 3 samples)	Manufacturer's Specified Weight ± tolerances, g
N/A			

TABLE 2
PRODUCTION UPPER and LOWER DISCHARGE TEST PARAMETERS

Cell Models	Section No.	No. of Production Samples Tested per Month (≥ 3 Samples for each discharge)	Upper Discharge Test		Lower Discharge Test	
			Discharge Rate, mA	Mfg. Specified Tolerances for V/C Discharge Profile	Discharge Rate, mA	Mfg. Specified Tolerances for V/C Discharge Profile
N/A						

COMPONENT - LITHIUM BATTERIES (BBCV2, BBCV3)

TABLE 3
PRODUCTION LEAKAGE TEST PARAMETERS

Cell Models	Section No.	No. of Production Samples Tested per Month, (≥ 5 Samples)
N/A		

TABLE 4
PRODUCTION X-RAY CONSTRUCTION REVIEW PARAMETERS

Cell Models	Section No.	No. of Production Samples Tested per Month, (≥ 10 Samples)
N/A		

SECTION GENERAL

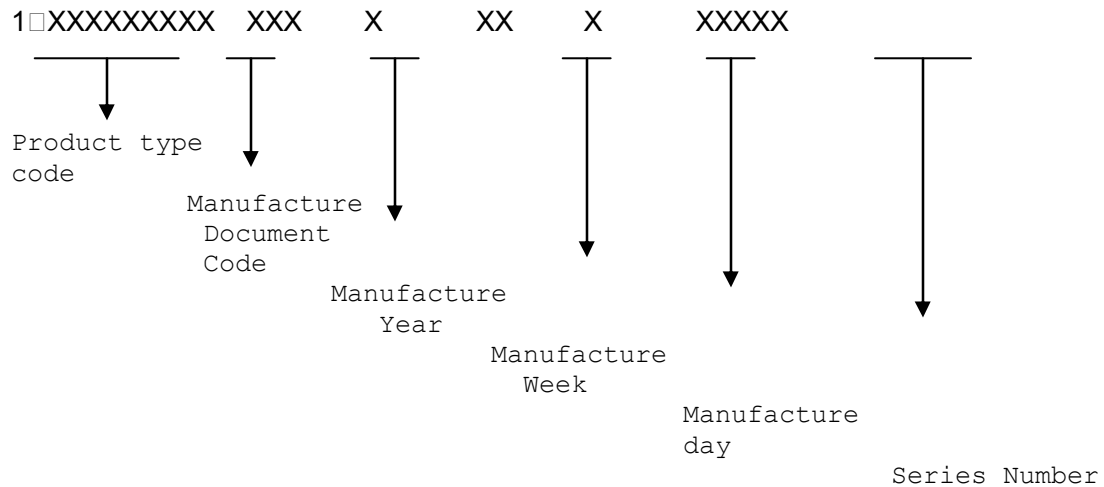
PRODUCT COVERED:

Component - Polymer Lithium Ion Rechargeable Cells (BBCV2).

MARKING:

Marking requirements are outlined in the individual sections describing the cells.

DATE CODE:



For example:

GP1003450 116 1 15 7 00124 represents that the product is manufactured on 2011, the 15th week, Sunday.

File MH48131
Project 12CA58903

September 08, 2011

REPORT

on

COMPONENT - Lithium Batteries

GLOBTEK INC
NORTHVALE, NJ

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DESCRIPTION

PRODUCT COVERED:

USR Component - Secondary, lithium-ion polymer cells as noted below.

Model Number	Chemistry	Shape/Type
All Models	$\text{LiCoO}_2 + 6\text{C} \rightleftharpoons \text{Li}_x\text{C}_6 + \text{Li}_{1-x}\text{CoO}_2$	Prismatic/ Pouch

ELECTRICAL RATING:

See also Conditions of Acceptability for charge limit specifications.

Model Number	Voltage (Nominal), Vdc	Capacity, (Nominal), Ah
GP602065	3.7	0.740
GP403040	3.7	0.340
GP453040	3.7	0.490
GP603040	3.7	0.680
GP413443	3.7	0.560
GP563496	3.7	1.900
GP404255	3.7	1.0
GP1003450	3.7	1.700
GP383562	3.7	0.820
GP503759	3.7	1.050
GP724040	3.7	1.200
GP903852	3.7	1.700
GP925050	3.7	2.2
GP654086	3.7	2.100
GP5440104	3.7	2.400
GP6050100	3.7	3.000
GP4345135	3.7	3.200
GP455068	3.7	1.600
GP525068	3.7	1.800
GP325385	3.7	1.500
GP456074	3.7	1.950
GP606168	3.7	2.600
GP4265125	3.75	3.2
GP5449118	3.7	3.2
GP6560106	3.7	4.0
GP823456	3.7	1.75
GP502030	3.7	0.25
GP583475	3.7	1.6
GP604570	3.7	2.1
GP753465	3.7	1.85
GP482970	3.7	1.1
GP454362	3.7	1.3
GP438384	3.7	3.4
GP4575100	3.7	4.0
GP383450	3.7	0.65
GP705573	3.7	3.0
GP503450	3.7	0.9

Table continue

Model Number	Voltage (Nominal), Vdc	Capacity, (Nominal), Ah
GP621738	3.7	0.39
GP452050	3.7	0.40
GP453038	3.7	0.45
GP622535	3.7	0.50
GP503048	3.7	0.75
GP603443	3.7	0.80
GP553437	3.7	0.65
GP822855	3.7	1.35
GP455085	3.7	2.2
GP844858	3.7	2.5
GP804969	3.7	3.0
GP925060	3.7	3.0
GP925176	3.7	4.0
GP835085	3.7	4.0
GP596193	3.7	4.2
GP322970	3.7	0.55
GP803040	3.7	0.95
GP423382	3.7	1.4
GP554858	3.7	1.95
GP634070	3.7	2.0
GP784863	3.7	2.5
GP3565120	3.7	3.0
GP457590	3.7	3.5
GP854678	3.7	3.0
GP607080	3.7	3.8
GP3581117	3.7	4.0
GP3660165	3.7	4.0
GP756074	3.7	4.1
GP696483	3.7	4.5
GP905385	3.7	5.1

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

USR indicates compliance with the requirements outlined in UL 1642, Standard for Lithium Batteries, including revision through revision date Nov. 25, 2009

Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Conditions of Acceptability - The use of these cells may be considered generally acceptable under the conditions given below:

1. The cells are intended for use at ordinary temperatures where anticipated high temperature excursions are not expected to exceed 100°C (212°F) or as noted below.

Model	Manufacturer's Maximum Specified Charge and Discharge Temperature, °C
All Models	-20 °C to 50 °C

2. These cells are to be used only in devices where servicing of the cell circuit and installation and replacement of the lithium-ion cells will be done by a trained technician. These cells are intended to be installed in a protective enclosure in the end use application that prevents access to the cells and associated cell circuitry by the user during charging and discharging of the cells.
3. These cells shall be installed within an enclosure that provides mechanical protection in the end use application, so that they protected from physical abuse that could result in damage to the cells including internal short circuits or shorting of terminals. Enclosures provided in the end use application shall prevent access to the cells through the use of simple tools or through openings.
4. The suitability of these cells for multi cell applications including series or parallel connections shall be determined in the end use. Cells used in multi-cell applications shall be of the same type, ratings and age to prevent the potential for explosions and fire due to cell imbalance.
5. For cells intended for series applications, protection shall be provided in the end use application to prevent cell reversal due to a forced discharge condition. A forced discharge test shall be conducted in the end use application for series connected cell applications.
6. These cells have been subjected to an abnormal charge test which subjects the cells to a constant current (CC) charge method followed by a constant voltage (CV) charge method. The test limit parameters for the abnormal charge test are outlined in the table below. The charging circuit in the end use application shall limit the charging current and charging voltage to the levels noted in the table under both normal and single fault condition. If the charging current and voltage in the end use application cannot be maintained at or below the levels noted in the table or if the charging method is different from the CC/CV method noted above, additional evaluation and testing may be necessary.

Model	Maximum Charging Current (Ic), mA	Maximum Charging Voltage (Vc), V dc
GP602065	370	4.35
GP403040	170	4.35
GP453040	245	4.35
GP603040	340	4.35
GP413443	280	4.35
GP563496	950	4.35
GP404255	500	4.35

Model	Maximum Charging Current (Ic), mA	Maximum Charging Voltage (Vc), V dc
GP1003450	850	4.35
GP383562	410	4.35
GP503759	525	4.35
GP724040	600	4.35
GP903852	850	4.35
GP925050	1100	4.35
GP654086	1050	4.35
GP5440104	1200	4.35
GP6050100	1500	4.35
GP4345135	1600	4.35
GP455068	800	4.35
GP525068	900	4.35
GP325385	750	4.35
GP456074	975	4.35
GP606168	1300	4.35
GP4265125	1600	4.35
GP5449118	1600	4.35
GP6560106	2000	4.35
GP823456	875	4.35
GP502030	125	4.35
GP583475	800	4.35
GP604570	1050	4.35
GP753465	925	4.35
GP482970	550	4.35
GP454362	650	4.35
GP438384	1700	4.35
GP4575100	2000	4.35
GP383450	325	4.35
GP705573	1500	4.35
GP503450	450	4.35

Model	Maximum Charging Current (Ic), mA	Maximum Charging Voltage (Vc), V dc
GP621738	195	4.35
GP452050	200	4.35
GP453038	225	4.35
GP622535	250	4.35
GP503048	375	4.35
GP603443	400	4.35
GP553437	325	4.35
GP822855	675	4.35
GP455085	1100	4.35
GP844858	1250	4.35
GP804969	1500	4.35
GP925060	1500	4.35
GP925176	2000	4.35
GP835085	2000	4.35
GP596193	2100	4.35
GP322970	275	4.35
GP803040	475	4.35
GP423382	700	4.35
GP554858	975	4.35
GP634070	1000	4.35
GP784863	1250	4.35
GP3565120	1500	4.35
GP457590	1750	4.35
GP854678	1500	4.35
GP607080	1900	4.35
GP3581117	2000	4.35
GP3660165	2000	4.35
GP756074	2050	4.35
GP696483	2250	4.35
GP905385	2550	4.35

7. Fire and/or explosion resulted when Model **GP4345135, GP404255, GP724040, GP325385, GP455068, GP525068, GP563496, GP5440104, GP606168, GP844858, GP804969, GP925060, GP925176, GP835085, GP596193, GP905385** were subjected to the impact test. These cells shall be provided with a mechanical enclosure that prevents impact of the cells in the end use application and special precautions should be taken when handling these cells during installation and disposal to prevent impact to the cells.
8. The following marking and instruction information is provided as guidance for replaceable battery packs that can be installed by other than trained technicians that would employ the cells covered in this report. These marking and instruction recommendations do not apply to the cells themselves. The need to include these markings and instructions shall be determined in the end use application.
 - A. A user replaceable lithium ion battery pack that employs these cells shall be marked with the following or equivalent:

"WARNING - Risk of Fire, Explosion, and Burns. Do No Disassembly, Crush, Heat Above [(manufacturer's recommended charge/discharge temperature)/(100C (212F))] or Incinerate.
 - B. The packaging of a user replaceable lithium ion battery pack that employs these cells shall be marked with the following or equivalent:

"CAUTION - Risk of Fire and Burns. Do No Disassemble, Heat Above [(manufacturer's recommended charge/discharge temperature)/ (100°C (212°F))] or Incinerate. Keep Battery Out of Reach of Children and in Original Package Until Ready to Use. Dispose of Used Batteries Promptly According to Local Recycling or Waste Regulations.
 - C. Instructions packaged with a user replaceable lithium ion battery pack that uses these cells shall include the following or equivalent:

"CAUTION - The battery used in this device may present a risk of fire or explosion when heated above [(manufacturer's recommended charge/discharge temperature)/(100°C (212°F))] or incinerated. Replace battery with (*battery manufacturer's name or end product manufacturer's name and part number*) only. Use of another battery may present a risk of fire or explosion."

The instructions shall also include information regarding how to replace the battery pack ending with the following statement or equivalent:

"Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire."

MARKINGS/INSTRUCTIONS:

Recognized Company, file No., trade name, trademark or other descriptive marking, Model designation, and date of manufacturer on the cell.

The cell or smallest package containing the cell shall be marked with the UL Recognition Mark.

The date of manufacture may be in the form of a code. See Section General for details of date code.

Lithium-Ion Polymer Cells - Fig. 1

General - See Ill. 1 for additional details of construction.

1. Cell Case - Consists of material, overall dimensions, and sealing methods, as noted below.

Model	Case Material	Case Dimensions, Mm			Case Matl. Thickness, mm	Method of Sealing	Case Sealing Material
		Length	Width	Thick-ness			
GP602065	Nylon + Al +PP	65±2	20±2	6.0±0.5	0.15	heating	CPP
GP403040	Nylon + Al +PP	40±2	30±2	4.0±0.5	0.15	heating	CPP
GP453040	Nylon + Al +PP	40±2	30±2	4.5±0.5	0.15	heating	CPP
GP603040	Nylon + Al +PP	40±2	30±2	6.0±0.5	0.15	heating	CPP
GP413443	Nylon + Al +PP	43±2	34±2	4.1±0.5	0.15	heating	CPP
GP563496	Nylon + Al +PP	96±2	34±2	5.6±0.5	0.15	heating	CPP
GP404255	Nylon + Al +PP	55±2	42±2	4.0±0.5	0.15	heating	CPP
GP1003450	Nylon + Al +PP	50±2	34±2	10.0±0.5	0.15	heating	CPP
GP383562	Nylon + Al +PP	62±2	35±2	3.8±0.5	0.15	heating	CPP
GP503759	Nylon + Al +PP	59±2	37±2	5.0±0.5	0.15	heating	CPP
GP724040	Nylon + Al +PP	40±2	40±2	7.2±0.5	0.15	heating	CPP
GP903852	Nylon + Al +PP	52±2	38±2	9.0±0.5	0.15	heating	CPP
GP925050	Nylon + Al +PP	50±2	50±2	9.2±0.5	0.15	heating	CPP
GP654086	Nylon + Al +PP	86±2	40±2	6.5±0.5	0.15	heating	CPP
GP5440104	Nylon + Al +PP	104±2	40±2	5.4±0.5	0.15	heating	CPP
GP6050100	Nylon + Al +PP	100±2	50±2	6.0±0.5	0.15	heating	CPP
GP4345135	Nylon + Al +PP	135±2	45±2	4.3±0.5	0.15	heating	CPP
GP455068	Nylon + Al +PP	68±2	50±2	4.5±0.5	0.15	heating	CPP
GP525068	Nylon + Al +PP	68±2	50±2	5.2±0.5	0.15	heating	CPP
GP325385	Nylon + Al +PP	85±2	53±2	3.2±0.5	0.15	heating	CPP

Model	Case Material	Case Dimensions, mm			Case Matl. Thick- ness, mm	Method of Sealing	Case Sealing Material
		Length	Width	Thick-ness			
--	--				--	--	--
GP456074	Nylon + Al +PP	74±2	60±2	4.5±0.5	0.15	heating	CPP
GP606168	Nylon + Al +PP	168±2	61±2	6.0±0.5	0.15	heating	CPP
GP4265125	Nylon + Al +PP	125+/-2	65+/-2	4.2+/-0.05	0.15	heating	CPP
GP5449118	Nylon + Al +PP	118+/-2	49+/-2	5.4+/-0.05	0.15	heating	CPP
GP6560106	Nylon + Al +PP	106+/-2	60+/-2	6.5+/-0.05	0.15	heating	CPP
GP823456	Nylon + Al +PP	56+/-2	34+/-2	8.2+/-0.05	0.15	heating	CPP
GP502030	Nylon + Al +PP	30+/-2	20+/-2	5.0+/-0.05	0.15	heating	CPP
GP583475	Nylon + Al +PP	75+/-2	34+/-2	5.8+/-0.05	0.15	heating	CPP
GP604570	Nylon + Al +PP	70+/-2	45+/-2	6.0+/-0.05	0.15	heating	CPP
GP753465	Nylon + Al +PP	65+/-2	34+/-2	7.5+/-0.05	0.15	heating	CPP
GP482970	Nylon + Al +PP	70+/-2	29+/-2	4.8+/-0.05	0.15	heating	CPP
GP454362	Nylon + Al +PP	62+/-2	43+/-2	4.5+/-0.05	0.15	heating	CPP
GP438384	Nylon + Al +PP	84+/-2	83+/-2	4.3+/-0.05	0.15	heating	CPP
GP4575100	Nylon + Al +PP	100+/-2	75+/-2	4.5+/-0.05	0.15	heating	CPP
GP383450	Nylon + Al +PP	50+/-2	34+/-2	3.8+/-0.05	0.15	heating	CPP
GP705573	Nylon + Al +PP	73+/-2	55+/-2	7.0+/-0.05	0.15	heating	CPP
GP503450	Nylon + Al +PP	50+/-2	34+/-2	5.0+/-0.05	0.15	heating	CPP
GP621738	Nylon + Al +PP	38+/-0.5	17+/-0.2	6.2+/-0.2	0.15	heating	CPP
GP452050	Nylon + Al +PP	50+/-0.5	20+/-0.2	4.5+/-0.2	0.15	heating	CPP
GP453038	Nylon + Al +PP	38+/-0.5	30+/-0.2	4.5+/-0.2	0.15	heating	CPP
GP622535	Nylon + Al +PP	35+/-0.5	25+/-0.2	6.2+/-0.2	0.15	heating	CPP
GP503048	Nylon + Al +PP	48+/-0.5	30+/-0.2	5.0+/-0.2	0.15	heating	CPP
GP603443	Nylon + Al +PP	43+/-0.5	34+/-0.2	6.0+/-0.2	0.15	heating	CPP
GP553437	Nylon + Al +PP	37+/-0.5	34+/-0.2	5.5+/-0.2	0.15	heating	CPP
GP822855	Nylon + Al +PP	55+/-0.5	28+/-0.2	8.2+/-0.2	0.15	heating	CPP
GP455085	Nylon + Al +PP	85+/-0.5	50+/-0.2	4.5+/-0.2	0.15	heating	CPP
GP844858	Nylon + Al +PP	58+/-0.5	48+/-0.2	8.4+/-0.2	0.15	heating	CPP
GP804969	Nylon + Al +PP	69+/-0.5	49+/-0.2	8.0+/-0.2	0.15	heating	CPP
GP925060	Nylon + Al +PP	60+/-0.5	50+/-0.2	9.2+/-0.2	0.15	heating	CPP
GP925176	Nylon + Al +PP	76+/-0.5	51+/-0.2	9.2+/-0.2	0.15	heating	CPP
GP835085	Nylon + Al +PP	85+/-0.5	50+/-0.2	8.3+/-0.2	0.15	heating	CPP
GP596193	Nylon + Al +PP	93+/-0.5	61+/-0.2	5.9+/-0.2	0.15	heating	CPP

Model	Case Material	Case Dimensions, mm			Case Matl. Thickness, mm	Method of Sealing	Case Sealing Material
		Length	Width	Thick-ness			
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GP322970	Nylon + Al +PP	70±1	29±1	3.2±1	0.15	heating	CPP
GP803040	Nylon + Al +PP	40±1	30±1	8.0±1	0.15	heating	CPP
GP423382	Nylon + Al +PP	82±1	33±1	4.2±1	0.15	heating	CPP
GP554858	Nylon + Al +PP	58±1	48±1	5.5±1	0.15	heating	CPP
GP634070	Nylon + Al +PP	70±1	40±1	6.3±1	0.15	heating	CPP
GP784863	Nylon + Al +PP	63±1	48±1	7.8±1	0.15	heating	CPP
GP3565120	Nylon + Al +PP	120±1	65±1	3.5±1	0.15	heating	CPP
GP457590	Nylon + Al +PP	90±1	75±1	4.5±1	0.15	heating	CPP
GP854678	Nylon + Al +PP	78±1	46±1	8.5±1	0.15	heating	CPP
GP607080	Nylon + Al +PP	80±1	70±1	6.0±1	0.15	heating	CPP
GP3581117	Nylon + Al +PP	117±1	81±1	3.5±1	0.15	heating	CPP
GP3660165	Nylon + Al +PP	165±1	65±1	3.6±1	0.15	heating	CPP
GP756074	Nylon + Al +PP	74±1	60±1	7.5±1	0.15	heating	CPP
GP696483	Nylon + Al +PP	83±1	64±1	6.9±1	0.15	heating	CPP
GP905385	Nylon + Al +PP	85±1	53±1	9.0±1	0.15	heating	CPP

2. Electrode Assemblies - Consists of positive and negative electrodes that are wound in concentric layers similar to cylindrical wound designs within the case and constructed as noted below.

Model No.	Positive Electrode		Negative Electrode		Negative Electrode/ Positive Electrode Capacity ratio (Ah _{NE} /Ah _{PE})
	Drawing No.	Dimensions, mm	Drawing No.	Dimensions, mm	
GP602065	I11.1	247×56	I11.1	283×57	1.07-1.10
GP403040	I11.1	269×30	I11.1	317×31	1.07-1.10
GP453040	I11.1	294×30	I11.1	655×31	1.07-1.10
GP603040	I11.1	395×30	I11.1	446×31	1.07-1.10
GP413443	I11.1	308×33	I11.1	362×34	1.07-1.10
GP563496	I11.1	396×86	I11.1	452×87	1.07-1.10
GP404255	I11.1	401×46	I11.1	469×47	1.07-1.10
GP1003450	I11.1	760×40	I11.1	822×41	1.07-1.10
GP383562	I11.1	286×52	I11.1	342×53	1.07-1.10
GP503759	I11.1	401×49	I11.1	461×50	1.07-1.10
GP724040	I11.1	715×31	I11.1	782×32	1.07-1.10
GP903852	I11.1	768×42	I11.1	835×43	1.07-1.10
GP925050	I11.1	1731×41	I11.1	1258×42	1.07-1.10
GP654086	I11.1	576×76	I11.1	643×77	1.07-1.10
GP5440104	I11.1	472×94	I11.1	537×95	1.07-1.10
GP6050100	I11.1	752×91	I11.1	831×92	1.07-1.10
GP4345135	I11.1	415×125	I11.1	486×126	1.07-1.10
GP455068	I11.1	511×58	I11.1	590×59	1.07-1.10
GP525068	I11.1	601×58	I11.1	681×59	1.07-1.10
GP325385	I11.1	348×75	I11.1	429×76	1.07-1.10
GP456074	I11.1	619×64	I11.1	713×65	1.07-1.10
GP606168	I11.1	853×58	I11.1	951×59	1.07-1.10

Model No.	Positive Electrode		Negative Electrode		Negative Electrode/ Positive Electrode Capacity ratio (Ah _{NE} /Ah _{PE})
	Drawing No.	Dimensions, mm	Drawing No.	Dimensions, mm	
GP4265125	I11.1	545.5*116*0.123	I11.1	687.5*117*0.127	1.07-1.10
GP5449118	I11.1	664*109*0.124	I11.1	741*110*0.126	1.07-1.10
GP6560106	I11.1	1083*97*0.121	I11.1	1185*97*0.121	1.07-1.10
GP823456	I11.1	705*47*0.121	I11.1	760*48*0.120	1.07-1.10
GP502030	I11.1	222*22*0.125	I11.1	256*22*0.122	1.07-1.10
GP583475	I11.1	461*65*0.126	I11.1	532*66*0.125	1.07-1.10
GP604570	I11.1	636*61*0.124	I11.1	713*62*0.126	1.07-1.10
GP753465	I11.1	595*57*0.126	I11.1	656*57*0.128	1.07-1.10
GP482970	I11.1	319*61*0.128	I11.1	370*62*0.128	1.07-1.10
GP454362	I11.1	457*55*0.125	I11.1	533*55*0.125	1.07-1.10
GP438384	I11.1	861*75*0.126	I11.1	998*75*0.125	1.07-1.10
GP4575100	I11.1	823*90*0.126	I11.1	966*91*0.126	1.07-1.10
GP383450	I11.1	285*43*0.129	I11.1	348*43*0.130	1.07-1.10
GP705573	I11.1	942*64*0.124	I11.1	1035*65*0.126	1.07-1.10
GP503450	I11.1	468*42*0.124	I11.1	421*43*0.122	1.07-1.10
GP621738	I11.1	28*302	I11.1	29*278	1.07-1.10
GP452050	I11.1	41*192	I11.1	42*225	1.07-1.10
GP453038	I11.1	31*280	I11.1	32*327	1.07-1.10
GP622535	I11.1	26*371	I11.1	27*410	1.07-1.10
GP503048	I11.1	39*406	I11.1	40*371	1.07-1.10
GP603443	I11.1	34*496	I11.1	35*440	1.07-1.10
GP553437	I11.1	28*414	I11.1	29*469	1.07-1.10
GP822855	I11.1	47*490	I11.1	48*546	1.07-1.10
GP455085	I11.1	76*625	I11.1	77*563	1.07-1.10
GP844858	I11.1	49*1100	I11.1	50*1032	1.07-1.10
GP804969	I11.1	57*960	I11.1	58*1041	1.07-1.10
GP925060	I11.1	50*1121	I11.1	51*1206	1.07-1.10
GP925176	I11.1	65*1181	I11.1	66*1267	1.07-1.10
GP835085	I11.1	75*1191	I11.1	77*1044	1.07-1.10
GP596193	I11.1	83*1000	I11.1	84*928	1.07-1.10

Model No.	Positive Electrode		Negative Electrode		Negative Electrode/ Positive Electrode Capacity ratio (Ah _{NE} /Ah _{PE})
	Drawing No.	Dimensions, mm	Drawing No.	Dimensions, mm	
GP322970	I11.1	61×199	I11.1	62×243	1.07-1.10
GP803040	I11.1	31×549	I11.1	32×603	1.07-1.10
GP423382	I11.1	73×315	I11.1	74×367	1.07-1.10
GP554858	I11.1	49×647	I11.1	50×724	1.07-1.10
GP634070	I11.1	61×595	I11.1	62×661	1.07-1.10
GP784863	I11.1	54×945	I11.1	55×1025	1.07-1.10
GP3565120	I11.1	110×545	I11.1	111×644	1.07-1.10
GP457590	I11.1	80×842	I11.1	81×957	1.07-1.10
GP854678	I11.1	69×980	I11.1	70×1059	1.07-1.10
GP607080	I11.1	40×110	I11.1	71×1215	1.07-1.10
GP3581117	I11.1	106×678	I11.1	107×801	1.07-1.10
GP3660165	I11.1	155×545	I11.1	156×644	1.07-1.10
GP756074	I11.1	64×1153	I11.1	65×1251	1.07-1.10
GP696483	I11.1	73×1117	I11.1	74×1220	1.07-1.10
GP905385	I11.1	75×1191	I11.1	76×1281	1.07-1.10

3. Current Collectors - At the positive electrode consists of: Al

At the negative electrode consists of: Cu

4. Separator - Unlisted Component Separator constructed as noted below. The separator is sized to extend beyond the electrodes as noted below for reliable insulation.

Cell Model	Separator Mfg.	Type Designation	Report Reference (UnListed Component)		Dimensions, mm		Minimum Extension Beyond Electrodes, mm
			File Number	Issue Date	Width	Length	
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GP6020 65	USA Celgard	2325	MH48409	2011-09-09	60	537	1.5
GP4030 40	USA Celgard	2325	MH48409	2011-09-09	34	605	1.5

Cell Model	Separator Mfg.	Type Designation	Report Reference (UnListed Component)		Dimensions, mm		Minimum Extension Beyond Electrodes, mm
			File Number	Issue Date	Width	Length	
--	--	--					--
GP4530 40	USA Celgard	2325	MH48409	2011-09-09	34	655	1.5
GP6030 40	USA Celgard	2325	MH48409	2011-09-09	34	853	1.5
GP4134 43	USA Celgard	2325	MH48409	2011-09-09	34	932	1.5
GP5634 96	USA Celgard	2325	MH48409	2011-09-09	90	691	1.5
GP4042 55	USA Celgard	2325	MH48409	2011-09-09	50	896	1.5
GP1003 450	USA Celgard	2325	MH48409	2011-09-09	44	1583	1.5
GP3835 62	USA Celgard	2325	MH48409	2011-09-09	56	651	1.5
GP5037 59	USA Celgard	2325	MH48409	2011-09-09	53	883	1.5
GP7240 40	USA Celgard	2325	MH48409	2011-09-09	35	1506	1.5
GP9038 52	USA Celgard	2325	MH48409	2011-09-09	46	1610	1.5
GP9250 50	USA Celgard	2325	MH48409	2011-09-09	45	2439	1.5
GP6540 86	USA Celgard	2325	MH48409	2011-09-09	80	1235	1.5
GP5440 104	USA Celgard	2325	MH48409	2011-09-09	98	1029	1.5
GP6050 100	USA Celgard	2325	MH48409	2011-09-09	95	1602	1.5
GP4345 135	USA Celgard	2325	MH48409	2011-09-09	129	928	1.5

Cell Model	Separator Mfg.	Type Designation	Report Reference (UnListed Component)		Dimensions, mm		Minimum Extension Beyond Electrodes, mm
			File Number	Issue Date	Width	Length	
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GP455068	USA Celgard	2325	MH48409	2011-09-09	62	1128	1.5
GP525068	USA Celgard	2325	MH48409	2011-09-09	62	1308	1.5
GP325385	USA Celgard	2325	MH48409	2011-09-09	79	811	1.5
GP456074	USA Celgard	2325	MH48409	2011-09-09	68	1365	1.5
GP606168	USA Celgard	2325	MH48409	2011-09-09	62	1832	1.5
GP4265125	USA Celgard	2325	MH48409	2011-09-09	120+/-0.2	1355+/-1.0	1.5
GP5449118	USA Celgard	2325	MH48409	2011-09-09	113+/-0.2	1527+/-1.0	1.5
GP6560106	USA Celgard	2325	MH48409	2011-09-09	100+/-0.2	2400+/-1.0	1.5
GP823456	USA Celgard	2325	MH48409	2011-09-09	51+/-0.2	1450+/-1.0	1.5
GP502030	USA Celgard	2325	MH48409	2011-09-09	25+/-0.2	526+/-1.0	1.5
GP583475	USA Celgard	2325	MH48409	2011-09-09	69+/-0.2	1058+/-1.0	1.5
GP604570	USA Celgard	2325	MH48409	2011-09-09	65+/-0.2	1383+/-1.0	1.5
GP753465	USA Celgard	2325	MH48409	2011-09-09	60+/-0.2	1319+/-1.0	1.5
GP482970	USA Celgard	2325	MH48409	2011-09-09	65+/-0.2	883+/-1.0	1.5
GP454362	USA Celgard	2325	MH48409	2011-09-09	58+/-0.2	1086+/-1.0	1.5
GP438384	USA Celgard	2325	MH48409	2011-09-09	78+/-0.2	2060+/-1.0	1.5
GP4575100	USA Celgard	2325	MH48409	2011-09-09	94+/-0.2	1949+/-1.0	1.5
GP383450	USA Celgard	2325	MH48409	2011-09-09	46+/-0.2	710+/-1.0	1.5
GP705573	USA Celgard	2325	MH48409	2011-09-09	68+/-0.2	2012+/-1.0	1.5
GP503450	USA Celgard	2325	MH48409	2011-09-09	46+/-0.2	980+/-1.0	1.5
GP621738	USA Celgard	2325	MH48409	2011-09-09	32+/-0.2	567+/-1.0	1.5
GP452050	USA Celgard	2325	MH48409	2011-09-09	45+/-0.2	450+/-1.0	1.5
GP453038	USA Celgard	2325	MH48409	2011-09-09	35+/-0.2	650+/-1.0	1.5
GP622535	USA Celgard	2325	MH48409	2011-09-09	30+/-0.2	800+/-1.0	1.5
GP503048	USA Celgard	2325	MH48409	2011-09-09	43+/-0.2	830+/-1.0	1.5
GP603443	USA Celgard	2325	MH48409	2011-09-09	38+/-0.2	1125+/-1.0	1.5
GP553437	USA Celgard	2325	MH48409	2011-09-09	32+/-0.2	920+/-1.0	1.5
GP822855	USA Celgard	2325	MH48409	2011-09-09	51+/-0.2	1084+/-1.0	1.5
GP455085	USA Celgard	2325	MH48409	2011-09-09	80+/-0.2	1253+/-1.0	1.5
GP844858	USA Celgard	2325	MH48409	2011-09-09	53+/-0.2	2250+/-1.0	1.5
GP804969	USA Celgard	2325	MH48409	2011-09-09	61+/-0.2	2035+/-1.0	1.5
GP925060	USA Celgard	2325	MH48409	2011-09-09	54+/-0.2	2433+/-1.0	1.5

Cell Model	Separator Mfg.	Type Designation	Report Reference (Unlisted Component)		Dimensions, mm		Minimum Extension Beyond Electrodes, mm
			File Number	Issue Date	Width	Length	
--	--	--	File Number	Issue Date	Width	Length	--
GP925176	USA Celgard	2325	MH48409	2011-09-09	69+/-0.2	2480+/-1.0	1.5
GP835085	USA Celgard	2325	MH48409	2011-09-09	80+/-0.2	2356+/-1.0	1.5
GP596193	USA Celgard	2325	MH48409	2011-09-09	87+/-0.2	200+/-1.0	1.5
GP322970	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	480±10	65±2
GP803040	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	1175±10	35±2
GP423382	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	719±10	77±2
GP554858	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	1410±10	53±2
GP634070	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	1289±10	65±2
GP784863	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	2002±10	58±2
GP3565120	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	1245±10	114±2
GP457590	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	1856±10	84±2
GP854678	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	2067±10	73±2
GP607080	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	2368±10	74±2
GP3581117	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	1543±10	110±2
GP3660165	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	1245±10	159±2
GP756074	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	2444±10	68±2
GP696483	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	2379±10	77±2
GP905385	USA Celgard	2325	MH48409	2011-09-09	1.0-2.0	2503±10	79±2

5. Electrolyte - Constructed as noted below.

Cell Model	Generic Composition	Drawing No.
GP602065	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP403040	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP453040	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP603040	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP413443	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP563496	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP404255	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP1003450	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP383562	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP503759	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP724040	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP903852	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP925050	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP654086	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP5440104	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP6050100	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP4345135	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP455068	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP525068	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP325385	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP456074	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP606168	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP4265125	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP5449118	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP6560106	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP823456	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP502030	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP583475	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP604570	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP753465	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP482970	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP454362	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP438384	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP4575100	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP383450	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP705573	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP503450	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP621738	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP452050	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP453038	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP622535	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP503048	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP603443	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP553437	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP822855	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP455085	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP844858	LiPF6+EC+DC+DMC	TR1, ILL. 1

Cell Model	Generic Composition	Drawing No.
GP804969	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP925060	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP925176	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP835085	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP596193	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP322970	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP803040	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP423382	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP554858	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP634070	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP784863	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP3565120	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP457590	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP854678	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP607080	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP3581117	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP3660165	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP756074	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP696483	LiPF6+EC+DC+DMC	TR1, ILL. 1
GP905385	LiPF6+EC+DC+DMC	TR1, ILL. 1

6. Electrode Tabs - Are constructed as noted below.

Model	Tab Ill Nos.
GP602065	Positive: (material, dimension): nickel. 50mmx3mmx0.1mm Negative: (material, dimension): aluminum.50mmx3mmx0.1mm
GP403040	Positive: (material, dimension): nickel. 25mmx3mmx0.1mm Negative: (material, dimension): aluminum.25mmx3mmx0.1mm
GP453040	Positive: (material, dimension): nickel. 25mmx3mmx0.1mm Negative: (material, dimension): aluminum.25mmx3mmx0.1mm
GP603040	Positive: (material, dimension): nickel. 25mmx3mmx0.1mm Negative: (material, dimension): aluminum.25mmx3mmx0.1mm
GP413443	Positive: (material, dimension): nickel. 25mmx3mmx0.1mm Negative: (material, dimension): aluminum.25mmx3mmx0.1mm
GP563496	Positive: (material, dimension): nickel. 70mmx5mmx0.1mm Negative: (material, dimension): aluminum.70mmx5mmx0.1mm
GP404255	Positive: (material, dimension): nickel. 40mmx5mmx0.1mm Negative: (material, dimension): aluminum.40mmx5mmx0.1mm
GP1003450	Positive: (material, dimension): nickel. 35mmx5mmx0.1mm Negative: (material, dimension): aluminum.35mmx5mmx0.1mm
GP383562	Positive: (material, dimension): nickel. 45mmx5mmx0.1mm Negative: (material, dimension): aluminum.45mmx5mmx0.1mm
GP503759	Positive: (material, dimension): nickel. 45mmx5mmx0.1mm Negative: (material, dimension): aluminum.45mmx5mmx0.1mm
GP724040	Positive: (material, dimension): nickel. 25mmx5mmx0.1mm Negative: (material, dimension): aluminum.25mmx5mmx0.1mm
GP903852	Positive: (material, dimension): nickel. 35mmx5mmx0.1mm Negative: (material, dimension): aluminum.35mmx5mmx0.1mm
GP925050	Positive: (material, dimension): nickel. 35mmx5mmx0.1mm Negative: (material, dimension): aluminum.35mmx5mmx0.1mm
GP654086	Positive: (material, dimension): nickel. 70mmx5mmx0.1mm Negative: (material, dimension): aluminum.70mmx5mmx0.1mm
GP5440104	Positive: (material, dimension): nickel. 85mmx5mmx0.1mm Negative: (material, dimension): aluminum.85mmx5mmx0.1mm
GP6050100	Positive: (material, dimension): nickel. 85mmx5mmx0.1mm Negative: (material, dimension): aluminum.85mmx5mmx0.1mm
GP4345135	Positive: (material, dimension): nickel. 100mmx5mmx0.1mm Negative: (material, dimension): aluminum.100mmx5mmx0.1mm
GP455068	Positive: (material, dimension): nickel. 50mmx5mmx0.1mm Negative: (material, dimension): aluminum.50mmx5mmx0.1mm

Model	Tab Ill Nos.
GP525068	Positive: (material, dimension): nickel. 50mmx5mmx0.1mm Negative: (material, dimension): aluminum.50mmx5mmx0.1mm
GP325385	Positive: (material, dimension): nickel. 70mmx5mmx0.1mm Negative: (material, dimension): aluminum.70mmx5mmx0.1mm
GP456074	Positive: (material, dimension): nickel. 55mmx5mmx0.1mm Negative: (material, dimension): aluminum.55mmx5mmx0.1mm
GP606168	Positive: (material, dimension): nickel. 50mmx5mmx0.1mm Negative: (material, dimension): aluminum. 50mmx5mmx0.1mm
GP4265125	Positive: (material, dimension): nickel. 104mm x5mmx 0.1mm Negative: (material, dimension): aluminum. 104mm x5mmx 0.1mm
GP5449118	Positive: (material, dimension): nickel. 74mm x5mmx 0.1 mm Negative: (material, dimension): aluminum. 74mm x5mmx0.1 mm
GP6560106	Positive: (material, dimension): nickel. 79mm x5mmx0.1mm Negative: (material, dimension): aluminum. 79mm x5mmx0.1mm
GP823456	Positive: (material, dimension): nickel. 49mm x5mmx0.1mm Negative: (material, dimension): aluminum. 49mm x5mmx0.1mm
GP502030	Positive: (material, dimension): nickel. 27mm x2mmx0.1 mm Negative: (material, dimension): aluminum. 27mm x2mmx0.1 mm
GP583475	Positive: (material, dimension): nickel. 54mm x4mmx 0.1mm Negative: (material, dimension): aluminum. 54mm x4mmx 0.1mm
GP604570	Positive: (material, dimension): nickel. 54mm x4mmx 0.1mm Negative: (material, dimension): aluminum. 54mm x4mmx 0.1mm
GP753465	Positive: (material, dimension): nickel. 54mm x3mmx 0.1mm Negative: (material, dimension): aluminum. 54mm x3mmx 0.1mm
GP482970	Positive: (material, dimension): nickel. 54mm x4mmx 0.1mm Negative: (material, dimension): aluminum. 54mm x4mmx 0.1mm
GP454362	Positive: (material, dimension): nickel. 49mm x4mmx 0.1mm Negative: (material, dimension): aluminum. 49mm x4mmx 0.1mm
GP438384	Positive: (material, dimension): nickel. 64mm x5mmx0.1 mm Negative: (material, dimension): aluminum. 64mm x5mmx0.1 mm
GP4575100	Positive: (material, dimension): nickel. 70mm x5mmx0.1 mm Negative: (material, dimension): aluminum. 70mm x5mmx0.1 mm
GP383450	Positive: (material, dimension): nickel. 44mm x4mmx0.1 mm Negative: (material, dimension): aluminum. 44mm x4mmx0.1 mm
GP705573	Positive: (material, dimension): nickel. 49mm x5mmx0.1 mm Negative: (material, dimension): aluminum. 49mm x5mmx0.1 mm
GP503450	Positive: (material, dimension): nickel. 49mm x4mmx0.1 mm Negative: (material, dimension): aluminum. 49mm x4mmx0.1 mm

Model	Tab Ill Nos.
GP621738	Positive: (material, dimension): nickel. 3mm*10mm*0.1mm Negative: (material, dimension): aluminum. 3mm*10mm*0.1mm
GP452050	Positive: (material, dimension): nickel. 3mm*10mm*0.1mm Negative: (material, dimension): aluminum. 3mm*10mm*0.1mm
GP453038	Positive: (material, dimension): nickel. 3mm*10mm*0.1mm Negative: (material, dimension): aluminum. 3mm*10mm*0.1mm
GP622535	Positive: (material, dimension): nickel. 3mm*10mm*0.1mm Negative: (material, dimension): aluminum. 3mm*10mm*0.1mm
GP503048	Positive: (material, dimension): nickel. 3mm*10mm*0.1mm Negative: (material, dimension): aluminum. 3mm*10mm*0.1mm
GP603443	Positive: (material, dimension): nickel. 4mm*10mm*0.1mm Negative: (material, dimension): aluminum. 4mm*10mm*0.1mm
GP553437	Positive: (material, dimension): nickel. 3mm*10mm*0.1mm Negative: (material, dimension): aluminum. 3mm*10mm*0.1mm
GP822855	Positive: (material, dimension): nickel. 3mm*10mm*0.1mm Negative: (material, dimension): aluminum. 3mm*10mm*0.1mm
GP455085	Positive: (material, dimension): nickel. 4mm*10mm*0.1mm Negative: (material, dimension): aluminum. 4mm*10mm*0.1mm
GP844858	Positive: (material, dimension): nickel. 4mm*10mm*0.1mm Negative: (material, dimension): aluminum. 4mm*10mm*0.1mm
GP804969	Positive: (material, dimension): nickel. 4mm*10mm*0.1mm Negative: (material, dimension): aluminum. 4mm*10mm*0.1mm
GP925060	Positive: (material, dimension): nickel. 5mm*10mm*0.1mm Negative: (material, dimension): aluminum. 5mm*10mm*0.1mm
GP925176	Positive: (material, dimension): nickel. 6mm*10mm*0.1mm Negative: (material, dimension): aluminum. 6mm*10mm*0.1mm
GP835085	Positive: (material, dimension): nickel. 5mm*10mm*0.1mm Negative: (material, dimension): aluminum. 5mm*10mm*0.1mm
GP596193	Positive: (material, dimension): nickel. 4mm*10mm*0.1mm Negative: (material, dimension): aluminum. 4mm*10mm*0.1mm
GP322970	Positive: (material, dimension): nickel. 3mm*45mm*0.1mm Negative: (material, dimension): aluminum. 3mm*45mm*0.1mm
GP803040	Positive: (material, dimension): nickel. 3mm*35mm*0.1mm Negative: (material, dimension): aluminum. 3mm*35mm*0.1mm
GP423382	Positive: (material, dimension): nickel. 3mm*45mm*0.1mm Negative: (material, dimension): aluminum. 3mm*45mm*0.1mm
GP554858	Positive: (material, dimension): nickel. 4mm*45mm*0.1mm Negative: (material, dimension): aluminum. 4mm*45mm*0.1mm
GP634070	Positive: (material, dimension): nickel. 4mm*45mm*0.1mm Negative: (material, dimension): aluminum. 4mm*45mm*0.1mm
GP784863	Positive: (material, dimension): nickel. 4mm*45mm*0.1mm Negative: (material, dimension): aluminum. 4mm*45mm*0.1mm
GP3565120	Positive: (material, dimension): nickel. 4mm*70mm*0.1mm Negative: (material, dimension): aluminum. 4mm*70mm*0.1mm

Model	Tab Ill Nos.	
GP457590	Positive: (material, dimension): nickel.	5mm×70mm×0.1mm
	Negative: (material, dimension): aluminum.	5mm×70mm×0.1mm
GP854678	Positive: (material, dimension): nickel.	5mm×55mm×0.1mm
	Negative: (material, dimension): aluminum.	5mm×55mm×0.1mm
GP607080	Positive: (material, dimension): nickel.	5mm×45mm×0.1mm
	Negative: (material, dimension): aluminum.	5mm×45mm×0.1mm
GP3581117	Positive: (material, dimension): nickel.	5mm×70mm×0.1mm
	Negative: (material, dimension): aluminum.	5×70×0.1
GP3660165	Positive: (material, dimension): nickel.	4mm×70mm×0.1mm
	Negative: (material, dimension): aluminum.	4mm×70mm×0.1mm
GP696483	Positive: (material, dimension): nickel.	4mm×55mm×0.1mm
	Negative: (material, dimension): aluminum.	4mm×55mm×0.1mm
GP905385	Positive: (material, dimension): nickel.	4mm×55mm×0.1mm
	Negative: (material, dimension): aluminum.	4mm×55mm×0.1mm

7. Venting Mechanism - Pressure build up within the cells is prevented by a venting mechanism constructed as follows: It relieves pressure through the seam of cell.



