Tohoku Murata Manufacturing Co., Ltd.
1-1 Shimosugishita, Takakura, Hiwada-machi, Koriyama-shi, Fukushima, 963-0531 Japan
Tel.: +81-24-955-7770 / Fax: +81-24-955-7808

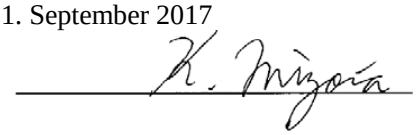
SICHERHEITSDATEN

1. Produkt- und Unternehmensidentifikation

Produktinformationen

Unternehmensbezeichnung	: SHIMANO INC.
Produktkategorie	: Lithium-Ionen-Akkupack
Modellname	: BT-E8010 / LIPY030
Nennleistung	: 14,0 Ah (504 Wh)
Mittlere Betriebsspannung	: 36 V

Unternehmensidentifikation

Name des Lieferanten	: Tohoku Murata Manufacturing Co., Ltd.
Adresse des Lieferanten	: 1-1 Shiosugishita, Takakura, Hiwada-machi, Koriyama-shi, Fukushima, 963-0531 Japan
Telefon für Auskünfte	: +81-24-955-7770
Erstellungsdatum	: 1. September 2017
Unterschrift auf Papier	: 

2. Gefahrenkennzeichnung

Klassenbezeichnung	: Gilt nicht für regulierte Klassen
Gefahr	: Wärmeentwicklung oder Elektrolytaustritt sind möglich, wenn die Batteriepole mit anderen Metallen in Kontakt kommen. Das Elektrolyt ist entzündlich. Im Falle eines Elektrolytlecks die Batterie umgehend aus der Nähe von Feuer entfernen.
Toxizität	: Die bei der Verbrennung von Batterien freigesetzten Dämpfe können Augen, Haut und Atemwege reizen.

3. Zusammensetzung / Angaben zu Bestandteilen:

WICHTIGER HINWEIS:

Das Akkupack umfasst vierzig wiederaufladbare Lithium-Ionen-Zellen vom Typ US18650VC7 und einen Steuerkreis auf der Leiterplatte. Die Zellen sind in 4 parallelen Ketten aus 10 Zellen in Reihe miteinander verbunden.
Der Akkupack darf nicht geöffnet oder verbrannt werden, da die folgenden in der Zelle enthaltenen Inhaltsstoffe bei ihrer Freisetzung oder bei unsachgemäßer Verwendung schädlich sein können.
Die Zelle enthält weder metallisches Lithium noch Lithium-Legierungen.

Kathode	: Lithium-Nickel-Kobaltoxide	(aktives Material)
	Polyvinylidenfluorid-	(Bindemittel)
	Graphit	(leitfähiges Material)
Anode	: Graphit	(aktives Material)
	Styrol-Butadien-Kautschuk / Carboxymethylcellulose-Natriumsalz	(Bindemittel)
Elektrolyt	: Organisches Lösungsmittel	(nicht wässrige Flüssigkeit)
	Lithiumsalz	
Sonstige	: Schwermetalle wie Quecksilber, Cadmium, Blei und Chrom werden im Akku nicht verwendet.	
Gehäuse	: Kunststoff (PC)	
UN-Nummer (Klasse)	: UN3480 (Klasse 9)	
UN-Verpackungsgruppe:	II	
Nennleistung in Wattstunden	: 504 Wh für Akkupack	

4. Erste-Hilfe-Maßnahmen

Das Produkt enthält organisches Elektrolyt. Im Fall eines Austritts von Elektrolyt aus der Batterie sind die nachstehend genannten Maßnahmen zu ergreifen.

Augenkontakt	: Augen sofort mindestens 15 Minuten lang mit sauberem Wasser spülen und keinesfalls reiben; ärztliche Hilfe hinzuziehen. Bei Unterlassung angemessener Maßnahmen kann es zur Reizung der Augen kommen.

Hautkontakt : Betroffene Hautpartien sofort mit reichlich Wasser und Seife waschen.
Bei Unterlassung angemessener Maßnahmen kann es zu Hautreizungen und Verätzungen kommen.

Einatmen : Sofort an die frische Luft gehen und ärztliche Hilfe hinzuziehen.

5. Maßnahmen zur Brandbekämpfung

- Spezielle Feuerlöscher (Gas, Schaum, Pulver) und Löschanlagen gemäß Brandschutzgesetz verwenden.
- Da zum Zeitpunkt des Feuerlöschens korrosives Gas entstehen kann, sollte bei drohender Gefahr eine Atemschutzmaske verwendet werden.
- Eine große Menge Wasser als unterstützende Maßnahme verwenden, um bei Bedarf eine Kühlwirkung zu erzielen. (Innen-/Außenhydrant)
- Im Brandfall brennbare Materialien sofort außer Reichweite bringen.
- Akkus im Brandfall sofort an einen sichereren Ort bringen.

6. Maßnahmen bei unbeabsichtigter Freisetzung

- Mit einem trockenen Tuch abwischen.
- Von Feuer fernhalten.
- Bei Bedarf Schutzbrille und Schutzhandschuhe tragen.

7. Vorsichtsmaßnahmen für die sichere Handhabung und Verwendung

Lagerung	:	Innerhalb der empfohlenen Grenzwerte von -20 bis 40 °C (-4 bis 104 °F) in einem gut durchlüfteten Raum lagern. Keinen hohen Temperaturen (80°C/176°F) aussetzen. Da ein Kurzschluss zu Brandgefahren oder zur Öffnung der Sicherheitsentlüftung führen kann, nicht mit Metallschmuck, Metalltischen oder Metallgurtteilen aufbewahren.
Handhabung	:	Nicht zerlegen, verändern oder löten. Die Plus- und Minuspole nicht mit Metall kurzschließen. Den Akkupack nicht öffnen.
Aufladen	:	Bei Temperaturen zwischen 0 und 60°C (zwischen 32 und 140°F) laden. Mit dem für diesen Akkupack vorgesehenen Ladegerät aufladen.
Entladen	:	Bei Temperaturen zwischen -20 und 80°C (zwischen 4 und 176°F) entladen.
Entsorgung	:	Das Produkt gemäß den geltenden staatlichen, regionalen und kommunalen Vorschriften entsorgen.
Achtung	:	Nicht verbrennen. Nicht zerlegen. Keinen hohen Temperaturen aussetzen. (60 °C/140 °F). Die Batterie keinen Schlägen, Stößen oder Quetschungen aussetzen. Nur das angegebene Ladegerät verwenden. Ordnungsgemäß entsorgen.

8. Expositionskontrolle und persönliche Schutzausrüstung (falls Elektrolyt aus dem Akku austritt)

Zulässige Konzentration	: Nicht in ACGIH angegeben.
Einrichtungen	: Angemessene Belüftung sicherstellen, z. B. durch eine örtliche Lüftungsanlage im Lager
Schutzkleidung	: Gasmaske für organische Gase, Schutzbrille, Sicherheitshandschuhe.

9. Physikalische und chemische Eigenschaften

Aussehen	: Lithium-Ionen-Akkus befinden sich in einem Harzgehäuse.
Mittlere Betriebsspannung	: 36 V

10. Stabilität und Reaktivität

Bei externen Kurzschlüssen, Verformungen durch Druck und hohe Temperaturen (über 100 °C) wird Wärme erzeugt, die zur Entzündung führen kann.

11. Toxikologische Informationen

Akute Toxizität	: Keine Informationen als Akku
Lokale Effekte	: Keine Informationen als Akku

12. Umweltbezogene Angaben

Bei leeren im Boden vergrabenen Akkus kann es zu Korrosion am Außengehäuse der Batterie kommen und Elektrolyt kann austreten. Zu Auswirkungen auf die Umwelt gibt es keine Informationen.

13. Bei der Entsorgung zu beachten

Wenn der Akku entsorgt wird, die Plus- (+) und Minuspole (-) der Batterie isolieren, um deren Berührung zu verhindern. Akkus können sich gegenseitig kurzschließen, wenn sie gestapelt oder mit anderen Akkus vermischt werden. Das Produkt gemäß den geltenden staatlichen, regionalen und kommunalen Vorschriften entsorgen.

14. Transport

- Beim Transport mehrerer Akkus auf dem Wasser, auf der Straße oder Schiene hohe Temperaturen und Kondensation vermeiden.
- Transportarten vermeiden, bei dem es zu Beschädigungen der Verpackung kommen kann.
- Lithium-Ionen-Batterien mit einer Wattstunden-Nennleistung über 100 Wh unterliegen der Gefahrgutverordnung für den Transport durch das Department of Transportation (DOT) der USA, die International Civil Aviation Organization (ICAO), die International Air Transport Association (IATA) bzw. die Vorschriften für International Maritime Dangerous Goods (IMDG). In Bezug auf den Lufttransport gilt die Verpackungsanweisung 965 Abschnitt I der International Civil Aviation Organization (ICAO) der entsprechenden Empfehlung; des Weiteren übernimmt die International Air Transport Association (IATA) die ICAO-Verpackungsanweisung 965 Abschnitt I. Darüber hinaus basieren die Vorschriften des Department of Transportation der USA für den Land-, See- und Lufttransport auf den UN-Empfehlungen.
- IATA: International Air Transport Association (Internationale Flug-Transport-Vereinigung)
  Gefahrgutvorschriften Verpackungsanweisung 965 (Lithium-Ionen- oder Lithium-Polymer-Zellen und Batterien ohne elektronische Ausrüstungen) mit Wirkung zum 1. April 2016: Lithium-Ionen-Zellen und -Batterien dürfen für den Transport einen Ladezustand von maximal 30 Prozent der Nennkapazität aufweisen. UN 3480, PI 965, Abschnitt IA und IB und II sind auf die Beförderung in Frachtflugzeugen beschränkt. Alle Pakete müssen zusätzlich zu den anderen gesetzlich vorgeschriebenen Kennzeichnungen das Etikett „Cargo Aircraft Only“ tragen.

  Die Fracht entspricht der Verpackungsanweisung 965 Abschnitt IA der IATA.
  Jede Zelle und jeder Akku entsprechen nachweislich den Anforderungen jeder Prüfung im UN-Handbuch über Prüfungen und Kriterien, Teil III, Unterabschnitt 38.3.
  Das fertige Paket für die Zellen oder Akkus entspricht den Leistungsstandards der Verpackungsgruppe II.
- IMDG – Gefahrgutkennzeichnung der Internationalen Seeschifffahrts-Organisation
  Laut IMDG-Gefahrgutliste (Kapitel 3.2) wird die Verpackungsgruppe der Lithium-Ionen-Batterie (UN Nr. 3480) als „-“ bezeichnet.
  Die Sendung entspricht jedoch der Verpackungsanweisung P903 gemäß IMDG.

15. Aufsichtsrechtliche Information

- IMDG-Code: International Maritime Dangerous Goods (IMDG) Code, Ausgabe 2016
- ICAO TI: International Civil Aviation Organization (ICAO): technische Anweisungen für den sicheren Transport von Gefahrgütern per Luft, Ausgabe 2017–2018
- IATA-DGR: International Air Transport Association (IATA), Gefahrgutvorschriften 58. Ausgabe

16. Sonstige Informationen

Die hierin enthaltenen Informationen dienen ausschließlich Ihrer Information. Die hier enthaltenen Informationen und Empfehlungen werden nach bestem Wissen und Gewissen bereitgestellt und gelten zum Zeitpunkt ihrer Zusammenstellung als zutreffend. Tohoku Murata Manufacturing GIBT JEDOCH WEDER AUSDRÜCKLICH NOCH STILLSCHWEIGEND EINE GARANTIE AUF DIESE INFORMATIONEN UND LEHNT JEGLICHE HAFTUNG AB, WENN AUF DIESE VERTRAUT WIRD.

2014002837Z

CNAS L2999

TEST REPORT OF CLASSIFICATION FOR DANGEROUS GOODS – LITHIUM METAL AND LITHIUM ION BATTERIES

Report ID: 2016036J2292

Sample Name: Lithium-ion Battery Pack

Model/Type: BT-E8010

Applicant: Sony Electronics (Wuxi) Co., Ltd.

CQC Intime Testing Technology Co.,Ltd

TEST REPORT

Report ID: 2016036J2292

Project Leader: 沙 海 勇 **Signature:**

Verdict : 曹 玮 **Signature:**

Issued By : 邓 爽 **Signature:**

Date of issue : May. 06, 2016

Test Unit: CQC Intime Testing Technology Co., Ltd

Address: East Taihu Technology and Finance City, No.1368 Wuzhong Dadao Rd., Wuzhong Economic Development Zone, Suzhou, Jiangsu.

Postal code: 215104 **Phone:** 0512-66303623 **Fax:** 0512-66303625

Testing location/procedure: East Taihu Technology and Finance City, No.1368 Wuzhong Dadao Rd., Wuzhong Economic Development Zone, Suzhou, Jiangsu.

Applicant's name: Sony Electronics (Wuxi) Co., Ltd..

Address: No.27, Changjiang Road, New District, Wuxi, Jiangsu Province

Sample Name: Lithium-ion Battery Pack **Trade Mark:** SHIMANO

Model/Type: BT-E8010 **Ratings:** 36V 14.0Ah

Manufacturer: Sony Electronics (Wuxi) Co., Ltd..

Address: No.27, Changjiang Road, New District, Wuxi, Jiangsu Province

Standard Specification: UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3. Rev.5

Test Procedure: — **Non-standard Test Method:** —

Test Item: Altitude Simulation, Thermal Test, Vibration, Shock, External Short Circuit, Impact, Overcharge, Force Discharge

Date of receipt of test item: Mar. 28, 2016

Test Period: Mar. 29, 2016 ~ May. 04, 2016

Conclusion: The Submitted Sample(s) Meet the Requirement of the Standard.

Testing Conditions: Temperature: 21.5℃ ~ 25.2℃ Relative Humidity: 53.7%~65.5%

Battery Critical Component List

No	Name	Model/Type	Manufacturer	Remarks
1	BMS	BQ77PL900	Texas Instruments	--
2	Cell	18650VC7	--	--
3	Intercell tabs	Ni	--	--
4	Plastics cases and Lida	PC	KINGFA	--
5	Fuse	--	--	--
6	--	--	--	--
7	--	--	--	--
8	--	--	--	--
9	--	--	--	--
10	--	--	--	--

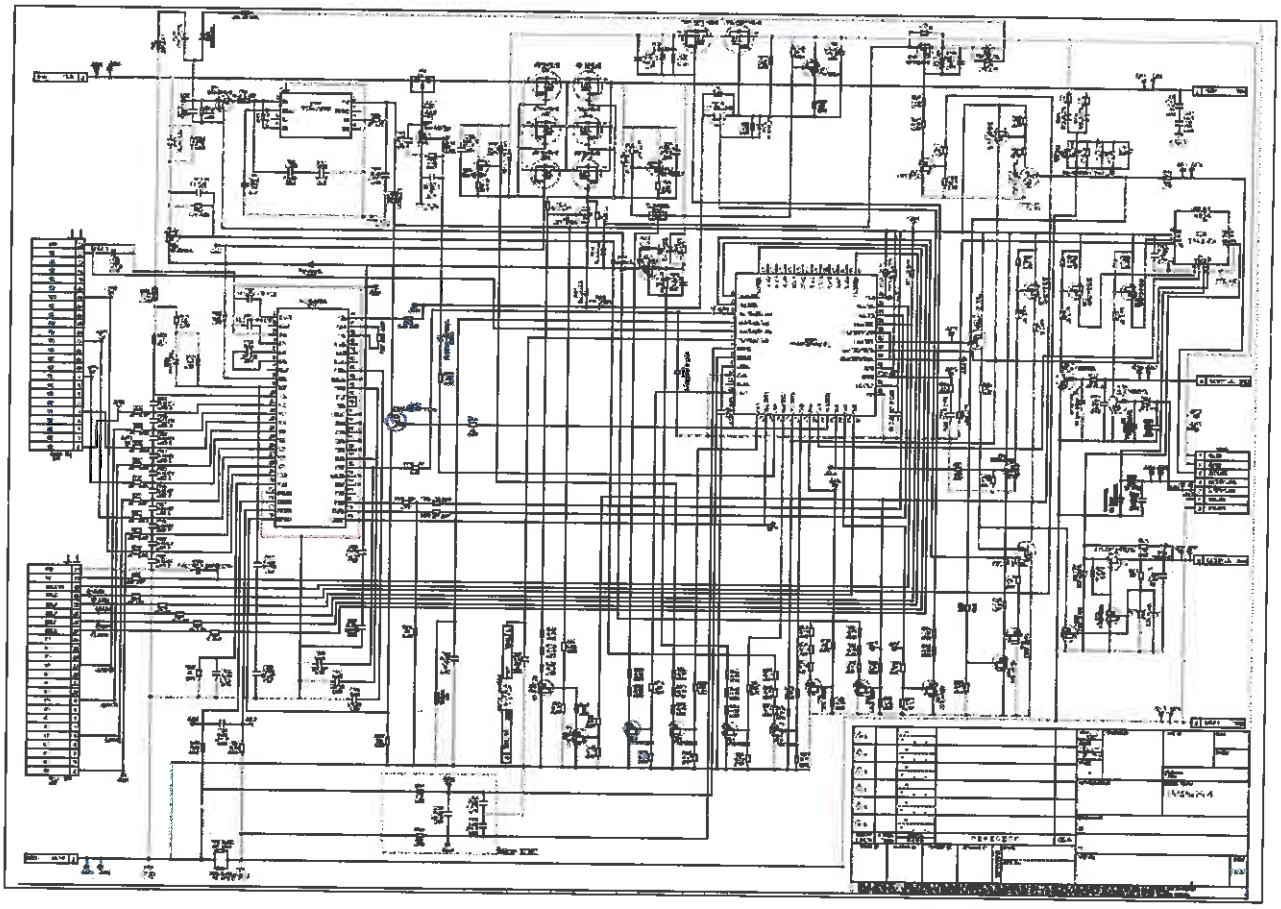
Cell Main Chemical Composition

No	Name	Component	Manufacturer	Remarks
1	Cathode material	Lithium Nickel Cobalt Aluminum Oxides	--	--
2	Anode material	Graphite Silicon Monoxide	--	--
3	Conductive agent	Graphite	--	--
4	Binder	Styrene-butadiene rubber Polyvinylidene fluoride	--	--
5	Seperator	Polyethylene	--	--
6	Electrolyte	Organic Solvent	--	--
7	--	--	--	--
8	--	--	--	--
9	--	--	--	--
10	--	--	--	--

The Table of Battery Fundamental Parameters

Item	Rated Performance	Item	Rated Performance
Nominal capacity (Ah)	14.0	Nominal voltage(V)	36.0
Rated power(Wh)	504.00	Limited charge voltage(V)	42.0
Charge current(A)	4.36A(~40V) 4.0A(40~42V)	Maximum continous charging current (A)	6.0
End charge current(mA)	500.0	Discharge current(A)	20.0
Cut-off voltage (V)	30.0	Cell numbers	40
Maximum discharge current(A)	30A/5s	Type of cellt(mm)	CylindricalΦ≤20
Permutation of cell	10S4P	Capacity of cell(Ah)	3.5
--	--	--	--
--	--	--	--

The Battery Electrical Connection Diagram



Sample photograph-1

Sample photograph-2

Sample photograph-3

Sample photograph-4

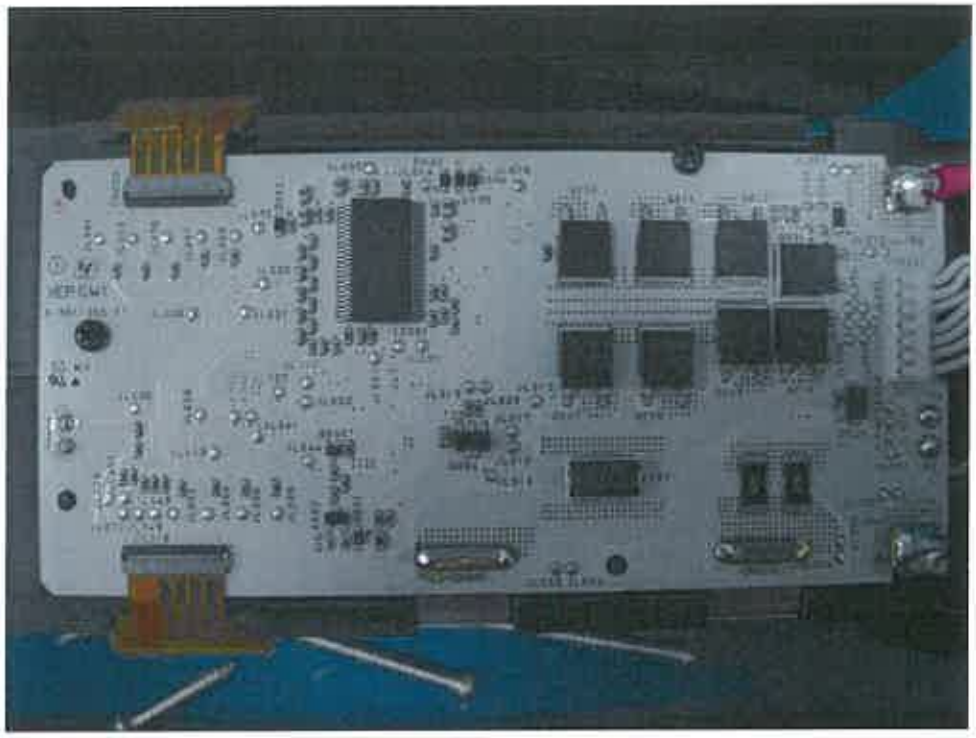
Sample photograph-5

Sample photograph-6

Sample photograph-7

Sample photograph-8

Sample photograph-9



Sample photograph-10

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.1 Altitude simulation	**Battery at first cycle in fully charged state.** Test batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20 ± 5℃).	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.	/	Group1 Group2 Group3 Group4	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage. No mass loss. Test data is shown in Annex 1.	P
	Battery after 50 cycles in fully charged state. Test batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20 ± 5℃).		/	Group5 Group6 Group7 Group8		P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results
UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.2 Thermal test	**Battery at first cycle in fully charged state.** Test batteries are to be stored for at least six hours at a test temperature equal to 72±2℃, followed by storage for at least six hours at a test temperature equal to -40±2℃. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test batteries are to be stored for 24 hours at ambient temperature (20±5℃).	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.	/	Group1 Group2 Group3 Group4	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage. No mass loss. Test data is shown in Annex 2.	P
	Battery after 50 cycles in fully charged state. Test batteries are to be stored for at least six hours at a test temperature equal to 72±2℃, followed by storage for at least six hours at a test temperature equal to -40±2℃. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test batteries are to be stored for 24 hours at ambient temperature (20±5℃).		/	Group5 Group6 Group7 Group8		P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.3 Vibration	**Battery at first cycle in fully charged state.** Batteries are firmly secured to the platform of the vibration machine without distorting the cells. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face. The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 g_n is maintained until18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 g_n occurs (approximately 50 Hz). A peak acceleration of 8 g_n is then maintained until the frequency is increased to 200 Hz.	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.	/	Group1 Group2 Group3 Group4	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage No mass loss. Test data is shown in Annex 3.	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results
UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.3 Vibration	**Battery after 50 cycles in fully charged state.** Batteries are firmly secured to the platform of the vibration machine without distorting the cells. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face. The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 g_n is maintained until18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 g_n occurs (approximately 50 Hz). A peak acceleration of 8 g_n is then maintained until the frequency is increased to 200 Hz.	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.	/	Group5 Group6 Group7 Group8	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage No mass loss . Test data is shown in Annex 3.	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.4 Shock	**Battery at first cycle in fully charged state.** Test batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each battery shall be subjected to a half sine shock of peak acceleration of 150 g_n and pulse duration of 6 milliseconds. Each battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the battery for a total of 18 shocks.	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.	/	Group1 Group2 Group3 Group4	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage. No mass loss . Test data is shown in Annex 4.	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results
UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.4 Shock	**Battery after 50 cycles in fully charged state.** Test batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each battery shall be subjected to a half sine shock of peak acceleration of 150 g_n and pulse duration of 6 milliseconds. Each battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the battery for a total of 18 shocks.	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.	/	Group5 Group6 Group7 Group8	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage. No mass loss . Test data is shown in Annex 4.	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.5 External short circuit	**Battery at first cycle in fully charged state.** The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 55±2℃and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at 55 ±2℃. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 55±2℃. The battery must be observed for a further six hours for the test to be concluded.	External temperature does not exceed 170℃. No disassembly No rupture No fire	/	Group1 Group2 Group3 Group4	External temperature does not exceed 170℃. No disassembly No rupture No fire Test data is shown in Annex 5.	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results
UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.5 External short circuit	**Battery after 50 cycles in fully charged state.** The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 55±2℃and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at 55 ±2℃. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 55±2℃. The battery must be observed for a further six hours for the test to be concluded.	External temperature does not exceed 170℃. No disassembly No rupture No fire	/	Group5 Group6 Group7 Group8	External temperature does not exceed 170℃. No disassembly No rupture No fire Test data is shown in Annex 5.	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.6 Impact	**Cell at first cycle at 50% of the design rated capacity.** The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg ± 0.1 kg mass is to be dropped from a height of 61 ± 2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface. The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm ± 0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact. The battery must be observed for a further six hours for the test to be concluded.	External temperature does not exceed 170℃. No disassembly No fire	/	1# 2# 3# 4# 5#	External temperature does not exceed 170℃. No disassembly No fire Test data is shown in Annex 6.	P

*: **Component Cells Of Battery.**

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results
UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.7 Overcharge	**Battery at first cycle in fully discharged state.** The charge current shall be the twice the manufactures recommended maximum continuous charge current. The minimum voltage of the test shall be follows: (a) When the manufactures recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V. (b) When the manufactures recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage. Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The test sample shall be observed for a further 7 days.	No disassembly No fire	/	Group 9 Group10 Group11 Group12	No disassembly No fire Test data is shown in Annex 7	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results
UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.7 Overcharge	**Battery after 50 cycles in fully charged state.** The charge current shall be the twice the manufactures recommended maximum continuous charge current. The minimum voltage of the test shall be follows: (c) When the manufactures recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V. (d) When the manufactures recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage. Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The test sample shall be observed for a further 7 days.	No disassembly No fire	/	Group13 Group14 Group15 Group16	No disassembly No fire Test data is shown in Annex 7	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results
UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.8 Forced discharge	**Battery at first cycle in fully discharged state.** Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer. The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere). The test sample shall be observed for a further 7 days.	No disassembly No fire	/	6#-15#	No disassembly No fire Test data is shown in Annex 8	P

*: **Component Cells Of Battery.**

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results
UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.8 Forced discharge	**Battery after 50 cycles in fully charged state.** Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer. The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere). The test sample shall be observed for a further 7 days.	No disassembly No fire	/	16#-25#	No disassembly No fire Test data is shown in Annex 8	P

*: **Component Cells Of Battery.**

CQC Intime Testing Technology Co., Ltd

TEST REPORT

List of Test Equipment

No	Test Equipment	Equipment Model	Equipment No	Expiry Date of Calibration	Remarks (√)
1	Low Pressure Chamber	315Z	ITCS1206013	2016.07.30	√
2	Thermal Shock Chambers	PHV1512-DW	ITCB13012	2016.10.08	√
3	Electric Vibration Test System	HV-300-D-25	ITCEN07007	2016.08.03	√
4	Battery Shock Tester	H-V-100	ITCEN07008	2016.08.03	√
5	High Temperature Explosion-proof Chamber	SPHH-101	ITCS06031	2016.11.22	√
6	Electric Vehicle Battery Tester	BNT100-0100ME	ITCB13010	2016.08.23	√
7	Electric Vehicle Battery Tester	BNT100-0100ME	ITCB13011	2016.08.23	√
8	Temperature Recorder	MV2020	ITCS11100001	2016.09.06	√
9	Digital Multicenter	FLUKE177	ITCS06060-3	2016.08.13	√
10	Battery internal resistance tester	BT3563	ITCB14001	2016.08.13	√
11	Battery Impact Tester	H-FZ-500	ITCEN07009	2017.04.20	√
12	High-precision battery tester	CT-3008W-20V6A-NTF	ITCS110201	2016.08.03	√
13	High-precision battery tester	CT-3008W-20V6A-NTF	ITCS110203	2016.08.03	√
14	Electronic Scale	BCS-ACSC-30	ITCS11030	2016.11.07	√
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CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 1. Altitude Simulation

No	Battery Condition	Before Test OCV_1 (V)	Before Test M_1 (g)	After Test OCV_2 (V)	After Test M_2 (V)	OCV_2/OCV_1 (%)	Mass Loss $(M_2-M_1)/M_1$(%)	Remarks
Group 1	First cycle fully charged	41.41	2556.5	41.40	2556.5	99.98%	0.000%	--
Group 2	First cycle fully charged	41.42	2566.0	41.41	2566.0	99.98%	0.000%	--
Group 3	First cycle fully charged	41.40	2565.0	41.40	2565.0	100.00%	0.000%	--
Group 4	First cycle fully charged	41.42	2567.0	41.41	2567.0	99.98%	0.000%	--
Group 5	After 50 cycles fully charged	41.40	2570.0	41.39	2570.0	99.98%	0.000%	--
Group 6	After 50 cycles fully charged	41.42	2565.0	41.41	2565.0	99.98%	0.000%	--
Group 7	After 50 cycles fully charged	41.43	2566.5	41.42	2566.5	99.98%	0.000%	--
Group 8	After 50 cycles fully charged	41.41	2565.5	41.40	2565.5	99.98%	0.000%	--
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Remarks:
NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 2. Thermal Test

No	Battery Condition	Before Test OCV_1 (V)	Before Test M_1 (g)	After Test OCV_2 (V)	After Test M_2 (V)	OCV_2/OCV_1 (%)	Mass Loss $(M_2-M_1)/M_1$(%)	Remarks
Group 1	First cycle fully charged	41.40	2556.5	41.02	2555.0	99.08%	0.059%	--
Group 2	First cycle fully charged	41.41	2566.0	41.03	2565.0	99.08%	0.039%	--
Group 3	First cycle fully charged	41.40	2565.0	41.05	2564.0	99.15%	0.039%	--
Group 4	First cycle fully charged	41.41	2567.0	41.01	2565.5	99.03%	0.058%	--
Group 5	After 50 cycles fully charged	41.39	2570.0	41.02	2568.5	99.11%	0.058%	--
Group 6	After 50 cycles fully charged	41.41	2565.0	41.00	2564.0	99.01%	0.039%	--
Group 7	After 50 cycles fully charged	41.42	2566.5	41.05	2565.0	99.11%	0.058%	--
Group 8	After 50 cycles fully charged	41.40	2565.5	41.04	2564.5	99.13%	0.039%	--
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Remarks:
NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 3. Vibration

No	Battery Condition	Before Test OCV_1 (V)	Before Test M_1 (g)	After Test OCV_2 (V)	After Test M_2 (V)	OCV_2/OCV_1 (%)	Mass Loss $(M_2-M_1)/M_1$(%)	Remarks
Group 1	First cycle fully charged	41.02	2555.0	41.01	2555.0	99.98%	0.000%	--
Group 2	First cycle fully charged	41.03	2565.0	41.02	2565.0	99.98%	0.000%	--
Group 3	First cycle fully charged	41.05	2564.0	41.04	2564.0	99.98%	0.000%	--
Group 4	First cycle fully charged	41.01	2565.5	41.00	2565.5	99.98%	0.000%	--
Group 5	After 50 cycles fully charged	41.02	2568.5	41.01	2568.5	99.98%	0.000%	--
Group 6	After 50 cycles fully charged	41.00	2564.0	41.00	2564.0	100.00%	0.000%	--
Group 7	After 50 cycles fully charged	41.05	2565.0	41.04	2565.0	99.98%	0.000%	--
Group 8	After 50 cycles fully charged	41.04	2564.5	41.03	2564.5	99.98%	0.000%	--
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Remarks:
NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 4. Shock

No	Battery Condition	Before Test OCV_1 (V)	Before Test M_1 (g)	After Test OCV_2 (V)	After Test M_2 (V)	OCV_2/OCV_1 (%)	Mass Loss $(M_2-M_1)/M_1$(%)	Remarks
Group 1	First cycle fully charged	41.01	2555.0	41.01	2555.0	100.00%	0.000%	--
Group 2	First cycle fully charged	41.02	2565.0	41.01	2565.0	99.98%	0.000%	--
Group 3	First cycle fully charged	41.04	2564.0	41.03	2564.0	99.98%	0.000%	--
Group 4	First cycle fully charged	41.00	2565.5	41.00	2565.5	100.00%	0.000%	--
Group 5	After 50 cycles fully charged	41.01	2568.5	41.00	2568.5	99.98%	0.000%	--
Group 6	After 50 cycles fully charged	41.00	2564.0	40.39	2564.0	98.51%	0.000%	--
Group 7	After 50 cycles fully charged	41.04	2565.0	41.03	2565.0	99.98%	0.000%	--
Group 8	After 50 cycles fully charged	41.03	2564.5	41.02	2564.5	99.98%	0.000%	--
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Remarks:
NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 5. External Short Circuit

No	Battery Condition	Voltage (V)	Initial Temperature (℃)	Max Temperature (℃)	Remarks
Group 1	First cycle fully charged	41.01	55.1	55.5	--
Group 2	First cycle fully charged	41.01	55.1	55.7	--
Group 3	First cycle fully charged	41.03	55.1	55.4	--
Group 4	First cycle fully charged	41.00	55.1	55.5	--
Group 5	After 50 cycles fully charged	41.00	55.2	55.5	--
Group 6	After 50 cycles fully charged	40.39	55.2	55.4	--
Group 7	After 50 cycles fully charged	41.03	55.1	55.6	--
Group 8	After 50 cycles fully charged	41.02	55.1	55.5	--
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Remarks:
NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 6. Impact

No	Battery Condition	Voltage (V)	Initial Temperature (℃)	Max Temperature (℃)	Remarks
1	First cycle in 50% rated capacity	3.463	25.0	113.2	--
2	First cycle in 50% rated capacity	3.464	24.8	37.6	--
3	First cycle in 50% rated capacity	3.464	24.5	90.3	--
4	First cycle in 50% rated capacity	3.462	24.5	100.3	--
5	First cycle in 50% rated capacity	3.462	25.1	117.0	--
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Remarks:
NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 7. Overcharge

No	Battery Condition	Voltage (V)	Initial Temperature (℃)	Max Temperature (℃)	Remarks
9 Group	First cycle in fully charged	41.40	23.3	24.5	--
10 Group	First cycle in fully charged	41.42	23.3	24.7	--
11 Group	First cycle in fully charged	41.43	23.2	24.5	--
12 Group	First cycle in fully charged	41.42	23.3	24.4	--
13 Group	After 50 cycles in fully charged	41.32	23.3	24.5	--
14 Group	After 50 cycles in fully charged	41.33	23.3	24.4	--
15 Group	After 50 cycles in fully charged	41.31	23.2	24.3	--
16 Group	After 50 cycles in fully charged	41.32	23.3	24.4	--
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Remarks:
NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 8. Force Discharge

No	Battery Condition	Voltage (V)	Initial Temperature (℃)	Max Temperature (℃)	Remarks
6#	First cycle in fully charged	3.261	23.3	84.8	--
7#	First cycle in fully charged	3.260	23.3	76.3	--
8#	First cycle in fully charged	3.217	23.3	83.5	--
9#	First cycle in fully charged	3.194	23.2	73.9	--
10#	First cycle in fully charged	3.196	23.2	84.6	--
11#	First cycle in fully charged	3.203	23.2	78.2	--
12#	First cycle in fully charged	3.172	23.3	77.6	--
13#	First cycle in fully charged	3.260	23.3	89.2	--
14#	First cycle in fully charged	3.195	23.3	86.3	--
15#	First cycle in fully charged	3.199	23.2	76.3	--
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Remarks:
NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 8. Force Discharge

No	Battery Condition	Voltage (V)	Initial Temperature (℃)	Max Temperature (℃)	Remarks
16#	After 50 cycles in fully charged	3.260	23.3	84.2	--
17#	After 50 cycles in fully charged	3.261	23.3	84.9	--
18#	After 50 cycles in fully charged	3.262	23.2	75.2	--
19#	After 50 cycles in fully charged	3.308	23.2	86.7	--
20#	After 50 cycles in fully charged	3.261	23.3	78.8	--
21#	After 50 cycles in fully charged	3.298	23.2	79.3	--
22#	After 50 cycles in fully charged	3.264	23.3	82.3	--
23#	After 50 cycles in fully charged	3.256	23.2	86.5	--
24#	After 50 cycles in fully charged	3.255	23.2	76.2	--
25#	After 50 cycles in fully charged	3.263	23.2	88.6	--
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Remarks:
NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

Unless otherwise stated, All of the above tests were conducted at 20 ± 5 ℃.

——End——