	Test Report issued under the responsibility of: **NCB TÜV SÜD PSB Pte Ltd** **1 Science Park Drive,** **Singapore 118221**	

TEST REPORT
IEC 60086-4
Primary batteries
Part 4: Safety of lithium batteries

Report Number. .....:	085-28217588-000
Date of issue .....:	2018-03-22
Total number of pages.....	22 pages
Name of Testing Laboratory preparing the Report.....:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Applicant's name.....:	EVE Energy Co.,Ltd
Address .....:	NO.36,Hui Feng 7th Road, Zhongkai Hi-Tech Zone, 516006 Huizhou,Guangdong, PEOPLE'S REPUBLIC OF CHINA
Test specification:	
Standard .....:	IEC 60086-4:2014 (Fourth Edition)
Test procedure.....:	CB Scheme
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC60086_4B
Test Report Form(s) Originator.....:	Intertek Semko AB
Master TRF.....:	Dated 2015-03

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description .....:	Lithium Thionyl Chloride Cell	
Trade Mark .....:	EVE®	
Manufacturer.....:	Same as the Applicant	
Model/Type reference .....:	ER14505	
Ratings .....:	3.6Vd.c., 2.7Ah	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒ **CB Testing Laboratory:**	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch	
Testing location/ address ..... :	No.11, Jukeng Rd., Juling Village, Jutang District, Guanlan, Longhua New District, 518110 Shenzhen, CHINA	
☐ **Associated CB Testing Laboratory:**		
Testing location/ address ..... :		
Tested by (name, function, signature) ..... :	Kyle Huang Project Handler	
Approved by (name, function, signature) .. :	Ryan Jin Project Reviewer	
☐ **Testing procedure: TMP/CTF Stage 1:**		
Testing location/ address ..... :		
Tested by (name, function, signature) ..... :		
Approved by (name, function, signature) .. :		
☐ **Testing procedure: WMT/CTF Stage 2:**		
Testing location/ address ..... :		
Tested by (name + signature)..... :		
Witnessed by (name, function, signature). :		
Approved by (name, function, signature) .. :		
☐ **Testing procedure: SMT/CTF Stage 3 or 4:**		
Testing location/ address ..... :		
Tested by (name, function, signature) ..... :		
Witnessed by (name, function, signature). :		
Approved by (name, function, signature) .. :		
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment):

Attachment No.1: 4 pages of Photo Documentation

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
Tests are made with the number of samples specified Table 1 and Table 2 of IEC 60086-4:2014 (Edition 4.0). Cl. 6.4.1 Test A: Altitude Cl. 6.4.2 Test B: Thermal cycling Cl. 6.4.3 Test C: Vibration Cl. 6.4.4 Test D: Shock Cl. 6.5.1 Test E: External short-circuit Cl. 6.5.3 Test G: Crush Cl. 6.5.4 Test H: Forced discharge Cl. 6.5.5 Test I: Abnormal charging Cl. 6.5.6 Test J: Free fall Cl. 6.5.7 Test K: Thermal abuse The samples comply with the requirements of IEC 60086-4:2014 (Edition 4.0).	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Address: No.11, Jukeng Rd., Juling Village, Jutang District, Guanlan, Longhua New District, 518110 Shenzhen, CHINA

Summary of compliance with National Differences: N/A

List of countries addressed

☐ **The product fulfils the requirements of _____ (insert standard number and edition and delete the text in parenthesis, leave it blank or delete the whole sentence, if not applicable)**

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Remark:

Date code: “MM YY XX” represents the date of manufacturing.
MM=01, 02, 03…12 is for the month. “01” represents “January”, “02” represents “February”, “03” represents “March” …, “12” represents “December”.
YY=00, 01, 02… 99 is for the year, “00” is for 2000, “01” is for 2001, “02” is for 2002… “99” is for 2099.
XX=01, 02…31 is for the date. “01” is the first day in month, “02” is the second day in month, …”31” is the 31st day.

Test item particulars.....:	
Classification of installation and use.....:	To be fixed in equipment.
Supply Connection.....:	Supply by positive cap and negative can.
Possible test case verdicts:	
- test case does not apply to the test object .....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement .....:	F (Fail)
Testing.....:	
Date of receipt of test item.....:	2017-11-23
Date (s) of performance of tests .....:	2017-11-27 to 2018-03-15
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. **Throughout this report a ☐ comma / ☒ point is used as the decimal separator.** The samples also comply with the requirement of EN 60086-4:2015. There are no differences between IEC 60086-4:2014 and EN 60086-4:2015.	
Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	☐ **Yes** ☒ **Not applicable**
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) .....:	Same as the Applicant.

General product information:

The Lithium Thionyl Chloride Cell, Model ER14505 is cylindrical primary lithium cell.
Additionally, detail information of the cell is as following:

Product name	Lithium Thionyl Chloride Cell
Type/model	ER14505
Nominal voltage	3.6Vd.c.
Rated capacity	2.7Ah
End-point Voltage	2.0V
Abnormal charging current declared by the manufacturer for test I (Ic)	10mA
Discharge current declared by manufacturer (standard discharging current)	50mA
Maximum continuous discharge current	50mA
Predischarge current or resistive load specified by the manufacturer	1mA
Normal reverse current declared by the manufacturer which can be applied to the battery during its operating life	0mA (the primary lithium cell is used in an equipment, there is no other power source in the equipment and the equipment is not connected to a power supply)
Dimension	Max. 14.50mm(Diameter) × max. 50.50mm(Height)
Weight	Approx. 18g

The final evaluation of the cell must be conducted in the end product for which the cell will be used.

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

4	**REQUIREMENTS FOR SAFETY**		**P**
4.1	**Design consideration**		P
	a) Abnormal temperature rise above the critical value		P
	b) Control of temperature increases in the battery		P
	c) Lithium cells and batteries shall be designed to relieve excessive internal pressure or to preclude a violent rupture under conditions of transport, intended use and reasonably foreseeable misuse.		P
4.2	**Quality plan**		**P**
	The manufacturer shall prepare and implement a quality plan defining the procedures for the inspection of materials, components, cells and batteries during the course of manufacture, to be applied to the total process of producing a specific type of battery. Manufactures should understand their process capabilities and should institute the necessary process controls as they relate to product safety.	The manufacturer has ISO 9001:2008 certificate and such quality plan.	P
5	**SAMPLING**		**P**
5.1	**General**		P
5.2	**Test samples**	(See table 1)	P
6	**TESTING AND REQUIREMENTS**		**P**
6.1	**General**		P
6.1.1	Test application	(See 6.2)	P
	s: cell or single cell battery ……..:	Cell	P
	m: multi cell battery ……..:		N/A
6.1.3	Ambient temperature ..... :		P
6.1.4	Parameter measurement tolerances		P
6.1.5	Predischarge		P
6.1.6	Additional cells		P
6.2	**Evaluation of test criteria**		P
6.2.1	Short-circuit		P
6.2.2	Excessive temperature rise		P
6.2.3	Leakage		P
6.2.4	Venting		P
6.2.5	Fire		P
6.2.6	Rupture		P
6.2.7	Explosion		P

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict
6.3	**Tests and requirements – Overview**	(See table 4 in the standard)	P
6.4	**Tests for intended use See the standard**		P
6.4.1	Test A: Altitude ……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.4.2	Test B: Thermal cycling .....……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.4.3	Test C: Vibration ……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.4.4	Test D: Shock ……..……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5	**Tests for reasonably foreseeable misuse**	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.1	Test E: External short-circuit ……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.2	Test F: Impact ……..……..……..:	Cylindrical cell not more than 20mm in diameter. (See appended Table 1 and Table 6.4.1 – 6.5.9)	N/A
6.5.3	Test G: Crush ……..……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.4	Test H: Forced discharge ..……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.5	Test I: Abnormal charging …..…..……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.6	Test J: Free fall ……..……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.7	Test K: Thermal abuse ……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.8	Test L: Incorrect installation ……..…..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	N/A
6.5.9	Test M: Overdischarge ……..……..:	(See appended Table 1 and Table 6.4.1 – 6.5.9)	N/A
6.6	**Information to be given in the relevant specification**		P
	a) Predischarge current or resistive load and end-point voltage specified by the manufacturer ……..……..:	Nominal discharge current: 1mA; end-point voltage: 2.0V.	P
	b) Shape: prismatic, flexible, coin or cylindrical Diameter: not more than 20 mm or greater than 20 mm. …..……..……..……..:	Shape: Cylindrical; Diameter: not more than 20 mm;	P

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict
	c) Maximum continuous discharge current specified by the manufacturer for test H; …..……..: NOTE Forced discharge of a cell can occur when it is connected in series with other cells and when it is not protected with a bypass diode.	50mA	P
	d) Rated capacity specified by the manufacturer for test H……: 	2.7Ah	P
	e) Abnormal charging current declared by the manufacturer for test I …..……..: NOTE Abnormal charging of a cell can occur when it is connected in series with other cells and one cell is reversed or when it is connected in parallel with a power supply and the protective devices do not operate correctly. and	I_C: 10mA	P
	f) Normal reverse current declared by the manufacturer which can be applied to the battery during its operating life……: NOTE Normal reverse current flow through a cell can occur when it is connected in parallel with a power supply and the protected devices are operating properly.	0mA (the primary lithium cell is used in an equipment, there is no other power source in the equipment and the equipment is not connected to a power supply)	P
7	**INFORMATION FOR SAFETY**		**P**
7.1	**Safety precautions during design of equipment**		P
7.1.1	General		P
7.1.2	Charge protection	Stated in Installation Manual.	P
7.1.3	Parallel connection	Stated in Installation Manual.	P
7.2	**Safety precautions during handling of batteries**		P
7.3	**Packaging**		P
7.4	**Handling of battery cartons**		P
7.5	**Transport**		P
7.5.1	General		P
7.5.2	Air transport		P
7.5.3	Sea transport		P
7.5.4	Land transport		P
7.6	**Display and storage**		P
7.7	**Disposal**		P
8	**INSTRUCTIONS FOR USE**		**P**

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict
9	**MARKING**		**P**
9.1	**General**		P
9.2	**Small batteries**		N/A
9.3	**Safety pictograms**		N/A

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE 1 and 6.4.1 – 6.5.9				P
Tests A-E	Cells and single cell batteries	Undischarged	10		P
		Fully discharged	10		P
	Multi cell batteries	Undischarged	4		N/A
		Fully discharged	4		N/A
Test F or G	Cells and single cell batteries	Undischarged	5		P
		Fully discharged	5		P
	Multi cell batteries	Undischarged	5 component cells		N/A
		Fully discharged	5 component cells		N/A
Test H	Cells and single cell batteries	Fully discharged	10		P
	Multi cell batteries		10 component cells		N/A
Test I to K	Cells and single cell batteries	Undischarged	5		P
	Multi cell batteries		5		N/A
Test L	Cells and single cell batteries	Undischarged	5 (+15)		N/A
	Multi cell batteries		n/a		N/A
Test M	Cells and single cell batteries	50% predischarged	5 (+15)		N/A
	Multi cell batteries		n/a		N/A
	Cells and single cell batteries	75% predischarged	5 (+15)		N/A
	Multi cell batteries		n/a		N/A

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Critical components information				P
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
1. Electrolyte	HZHR industrial co., Ltd.	81000065	$SOCl_2$ content ≥ 99.60%, H_2O content ≤ 50PPM, Density: 1.630 to 1.640g/mL (25°C)	-	-
2. Separator	Hollingsworth & Vose (Suzhou) Co., Ltd.	10000153	Fiberglass, Heat Loss: 6% to 8%. Bore diameter: ≤17μm, Tension: ≥1N	-	-
3. Negative electrode	EVE Energy Co.,Ltd	LI1.0x36.7mm	Metal lithium, etc., Li content ≥ 99.9%, Fe content ≤ 10PPM, Cu content ≤ 20PPM	-	-
4. Positive electrode	Mostbros chemicals Co., Ltd.	DK-2	Graphite, etc., Heat Loss ≤ 0.5%, Ash content: ≤ 0.2%, PH Value: 6 to 8, 50% Compressed	-	-
5. Cap	EVE Energy Co.,Ltd	ER14505	Φ(13.5+0.04/-0.01)mm × (2.8+0.1/-0.0)mm(Height), Stainless steel	-	-
6. Can	Shangyu daoxu hardware factory	ER14505	Stainless steel can, Φ14.1mm × 48.7mm(Height), 0.3mm thick	-	-
7. Heat-shrinking tube	Shanghai lvnong packaging materials Co., Ltd.	S7053	PET, HB, 140°C, 0.12mm thick.	-	-
Supplementary information: [1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

6.4.1	Test A: Altitude					P
Model	**Mass before test (g)**	**Open circuit voltage before test (V)**	**Mass after test (g)**	**Open circuit voltage after test (V)**	**Results**	
Undischarged samples						
ER14505	17.266	3.678	17.265	3.677	NL, NV, NC, NR, NE, NF	
ER14505	17.370	3.678	17.369	3.677	NL, NV, NC, NR, NE, NF	
ER14505	17.256	3.678	17.255	3.676	NL, NV, NC, NR, NE, NF	
ER14505	17.353	3.677	17.352	3.675	NL, NV, NC, NR, NE, NF	
ER14505	17.299	3.678	17.299	3.677	NL, NV, NC, NR, NE, NF	
ER14505	17.322	3.678	17.321	3.676	NL, NV, NC, NR, NE, NF	
ER14505	17.431	3.678	17.431	3.677	NL, NV, NC, NR, NE, NF	
ER14505	17.276	3.678	17.275	3.677	NL, NV, NC, NR, NE, NF	
ER14505	17.377	3.678	17.376	3.677	NL, NV, NC, NR, NE, NF	
ER14505	17.304	3.677	17.303	3.676	NL, NV, NC, NR, NE, NF	
Fully discharged samples						
ER14505	17.181	3.379	17.180	3.378	NL, NV, NC, NR, NE, NF	
ER14505	17.189	3.386	17.188	3.385	NL, NV, NC, NR, NE, NF	
ER14505	17.151	3.350	17.150	3.348	NL, NV, NC, NR, NE, NF	
ER14505	17.143	3.501	17.142	3.500	NL, NV, NC, NR, NE, NF	
ER14505	17.156	3.435	17.155	3.434	NL, NV, NC, NR, NE, NF	
ER14505	17.139	3.496	17.139	3.494	NL, NV, NC, NR, NE, NF	
ER14505	17.153	3.372	17.152	3.370	NL, NV, NC, NR, NE, NF	
ER14505	17.206	3.327	17.206	3.326	NL, NV, NC, NR, NE, NF	
ER14505	17.205	3.369	17.205	3.368	NL, NV, NC, NR, NE, NF	
ER14505	17.287	3.311	17.286	3.309	NL, NV, NC, NR, NE, NF	

Supplementary information:

NC: No short-circuit
NE: No explosion
NF: No fire
NL: No leakage
NR: No rupture
NT: No excessive temperature rise
NV: No venting

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

6.4.2	Test B: Thermal cycling					P
Model	**Mass before test (g)**	**Open circuit voltage before test (V)**	**Mass after test (g)**	**Open circuit voltage after test (V)**	**Results**	
Undischarged samples						
ER14505	17.265	3.677	17.263	3.674	NL, NV, NC, NR, NE, NF	
ER14505	17.369	3.677	17.366	3.674	NL, NV, NC, NR, NE, NF	
ER14505	17.255	3.676	17.252	3.673	NL, NV, NC, NR, NE, NF	
ER14505	17.352	3.675	17.350	3.671	NL, NV, NC, NR, NE, NF	
ER14505	17.299	3.677	17.297	3.674	NL, NV, NC, NR, NE, NF	
ER14505	17.321	3.676	17.319	3.673	NL, NV, NC, NR, NE, NF	
ER14505	17.431	3.677	17.429	3.674	NL, NV, NC, NR, NE, NF	
ER14505	17.275	3.677	17.273	3.674	NL, NV, NC, NR, NE, NF	
ER14505	17.376	3.677	17.374	3.674	NL, NV, NC, NR, NE, NF	
ER14505	17.303	3.676	17.301	3.672	NL, NV, NC, NR, NE, NF	
Fully discharged samples						
ER14505	17.180	3.378	17.179	3.375	NL, NV, NC, NR, NE, NF	
ER14505	17.188	3.385	17.186	3.382	NL, NV, NC, NR, NE, NF	
ER14505	17.150	3.348	17.148	3.345	NL, NV, NC, NR, NE, NF	
ER14505	17.142	3.500	17.139	3.497	NL, NV, NC, NR, NE, NF	
ER14505	17.155	3.434	17.152	3.431	NL, NV, NC, NR, NE, NF	
ER14505	17.139	3.494	17.137	3.491	NL, NV, NC, NR, NE, NF	
ER14505	17.152	3.370	17.150	3.366	NL, NV, NC, NR, NE, NF	
ER14505	17.206	3.326	17.203	3.322	NL, NV, NC, NR, NE, NF	
ER14505	17.205	3.368	17.203	3.365	NL, NV, NC, NR, NE, NF	
ER14505	17.286	3.309	17.284	3.306	NL, NV, NC, NR, NE, NF	

Supplementary information:

NC: No short-circuit
NE: No explosion
NF: No fire
NL: No leakage
NR: No rupture
NT: No excessive temperature rise
NV: No venting

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

6.4.3	Test C: Vibration					P
Model	**Mass before test (g)**	**Open circuit voltage before test (V)**	**Mass after test (g)**	**Open circuit voltage after test (V)**	**Results**	
Undischarged samples						
ER14505	17.263	3.674	17.262	3.672	NL, NV, NC, NR, NE, NF	
ER14505	17.366	3.674	17.363	3.671	NL, NV, NC, NR, NE, NF	
ER14505	17.252	3.673	17.251	3.670	NL, NV, NC, NR, NE, NF	
ER14505	17.350	3.671	17.349	3.670	NL, NV, NC, NR, NE, NF	
ER14505	17.297	3.674	17.295	3.671	NL, NV, NC, NR, NE, NF	
ER14505	17.319	3.673	17.318	3.669	NL, NV, NC, NR, NE, NF	
ER14505	17.429	3.674	17.427	3.671	NL, NV, NC, NR, NE, NF	
ER14505	17.273	3.674	17.273	3.672	NL, NV, NC, NR, NE, NF	
ER14505	17.374	3.674	17.368	3.670	NL, NV, NC, NR, NE, NF	
ER14505	17.301	3.672	17.299	3.669	NL, NV, NC, NR, NE, NF	
Fully discharged samples						
ER14505	17.179	3.375	17.177	3.372	NL, NV, NC, NR, NE, NF	
ER14505	17.186	3.382	17.182	3.378	NL, NV, NC, NR, NE, NF	
ER14505	17.148	3.345	17.145	3.341	NL, NV, NC, NR, NE, NF	
ER14505	17.139	3.497	17.137	3.495	NL, NV, NC, NR, NE, NF	
ER14505	17.152	3.431	17.150	3.428	NL, NV, NC, NR, NE, NF	
ER14505	17.137	3.491	17.135	3.488	NL, NV, NC, NR, NE, NF	
ER14505	17.150	3.366	17.147	3.362	NL, NV, NC, NR, NE, NF	
ER14505	17.203	3.322	17.200	3.320	NL, NV, NC, NR, NE, NF	
ER14505	17.203	3.365	17.201	3.361	NL, NV, NC, NR, NE, NF	
ER14505	17.284	3.306	17.280	3.304	NL, NV, NC, NR, NE, NF	

Supplementary information:

NC: No short-circuit
NE: No explosion
NF: No fire
NL: No leakage
NR: No rupture
NT: No excessive temperature rise
NV: No venting

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

6.4.4	Test D: Shock					P
Model	**Mass before test (g)**	**Open circuit voltage before test (V)**	**Mass after test (g)**	**Open circuit voltage after test (V)**	**Results**	
Undischarged samples						
ER14505	17.262	3.672	17.260	3.668	NL, NV, NC, NR, NE, NF	
ER14505	17.363	3.671	17.360	3.668	NL, NV, NC, NR, NE, NF	
ER14505	17.251	3.670	17.248	3.667	NL, NV, NC, NR, NE, NF	
ER14505	17.349	3.670	17.347	3.666	NL, NV, NC, NR, NE, NF	
ER14505	17.295	3.671	17.294	3.668	NL, NV, NC, NR, NE, NF	
ER14505	17.318	3.669	17.316	3.667	NL, NV, NC, NR, NE, NF	
ER14505	17.427	3.671	17.425	3.668	NL, NV, NC, NR, NE, NF	
ER14505	17.273	3.672	17.270	3.670	NL, NV, NC, NR, NE, NF	
ER14505	17.368	3.670	17.360	3.669	NL, NV, NC, NR, NE, NF	
ER14505	17.299	3.669	17.297	3.666	NL, NV, NC, NR, NE, NF	
Fully discharged samples						
ER14505	17.177	3.372	17.175	3.369	NL, NV, NC, NR, NE, NF	
ER14505	17.182	3.378	17.179	3.375	NL, NV, NC, NR, NE, NF	
ER14505	17.145	3.341	17.144	3.339	NL, NV, NC, NR, NE, NF	
ER14505	17.137	3.495	17.136	3.491	NL, NV, NC, NR, NE, NF	
ER14505	17.150	3.428	17.147	3.425	NL, NV, NC, NR, NE, NF	
ER14505	17.135	3.488	17.133	3.485	NL, NV, NC, NR, NE, NF	
ER14505	17.147	3.362	17.145	3.360	NL, NV, NC, NR, NE, NF	
ER14505	17.200	3.320	17.196	3.317	NL, NV, NC, NR, NE, NF	
ER14505	17.201	3.361	17.197	3.358	NL, NV, NC, NR, NE, NF	
ER14505	17.280	3.304	17.277	3.302	NL, NV, NC, NR, NE, NF	

Supplementary information:

NC: No short-circuit
NE: No explosion
NF: No fire
NL: No leakage
NR: No rupture
NT: No excessive temperature rise
NV: No venting

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

6.5.1	Test E: External short-circuit					P
Model	**Open circuit voltage before test (V)**	**Open circuit voltage after test (V)**	**Maximum case temperature (°C)**	**Total external resistance (Ω)**	**Results**	
Undischarged samples						
ER14505	3.668	3.418	114.8	0.077	NT, NR, NE, NF	
ER14505	3.668	3.427	117.2	0.086	NT, NR, NE, NF	
ER14505	3.667	3.419	118.1	0.081	NT, NR, NE, NF	
ER14505	3.666	3.425	105.1	0.075	NT, NR, NE, NF	
ER14505	3.668	3.422	103.5	0.079	NT, NR, NE, NF	
ER14505	3.667	3.430	109.0	0.082	NT, NR, NE, NF	
ER14505	3.668	3.427	110.7	0.074	NT, NR, NE, NF	
ER14505	3.670	3.424	102.6	0.076	NT, NR, NE, NF	
ER14505	3.669	3.422	102.9	0.085	NT, NR, NE, NF	
ER14505	3.666	3.428	116.9	0.088	NT, NR, NE, NF	
Fully discharged samples						
ER14505	3.369	0.017	56.6	0.082	NT, NR, NE, NF	
ER14505	3.375	0.008	56.0	0.074	NT, NR, NE, NF	
ER14505	3.339	0.014	56.2	0.076	NT, NR, NE, NF	
ER14505	3.491	0.006	56.1	0.085	NT, NR, NE, NF	
ER14505	3.425	0.018	56.1	0.088	NT, NR, NE, NF	
ER14505	3.485	0.009	56.1	0.077	NT, NR, NE, NF	
ER14505	3.360	0.014	56.1	0.086	NT, NR, NE, NF	
ER14505	3.317	0.019	56.2	0.081	NT, NR, NE, NF	
ER14505	3.358	0.015	56.2	0.075	NT, NR, NE, NF	
ER14505	3.302	0.012	56.1	0.079	NT, NR, NE, NF	

Supplementary information:

NC: No short-circuit
NE: No explosion
NF: No fire
NL: No leakage
NR: No rupture
NT: No excessive temperature rise
NV: No venting

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

6.5.3	Test G: Crush					P
Model	**Open circuit voltage before test (V)**	**OCV at removal of crushing force, Vdc**	**Applied force (kN)**	**Maximum case temperature (°C)**	**Results**	
Undischarged samples						
ER14505	3.677	3.674	12.385	21.6	NT, NE, NF	
ER14505	3.677	3.674	12.176	21.7	NT, NE, NF	
ER14505	3.678	3.676	12.613	21.7	NT, NE, NF	
ER14505	3.677	3.675	12.926	21.9	NT, NE, NF	
ER14505	3.677	3.673	12.817	22.1	NT, NE, NF	
Fully discharged samples						
ER14505	3.385	3.312	0.843	21.3	NT, NE, NF	
ER14505	3.564	3.497	10.880	21.3	NT, NE, NF	
ER14505	3.548	3.416	9.797	21.4	NT, NE, NF	
ER14505	3.559	3.385	9.663	21.6	NT, NE, NF	
ER14505	3.319	3.284	10.584	21.4	NT, NE, NF	

Supplementary information:

NC: No short-circuit
NE: No explosion
NF: No fire
NL: No leakage
NR: No rupture
NT: No excessive temperature rise
NV: No venting

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

6.5.4	Test H: Forced discharge			P
Model	**OCV at Start of Test, Vdc**	**Initial discharge current, mA**	**Time interval, hours**	**Results**
Fully discharged samples				
ER14505	3.516	50	54	NE, NF
ER14505	3.527	50	54	NE, NF
ER14505	3.438	50	54	NE, NF
ER14505	3.397	50	54	NE, NF
ER14505	3.484	50	54	NE, NF
ER14505	3.522	50	54	NE, NF
ER14505	3.378	50	54	NE, NF
ER14505	3.419	50	54	NE, NF
ER14505	3.411	50	54	NE, NF
ER14505	3.447	50	54	NE, NF

Supplementary information:

NC: No short-circuit
NE: No explosion
NF: No fire
NL: No leakage
NR: No rupture
NT: No excessive temperature rise
NV: No venting

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

6.5.5	Test I: Abnormal charging	P

Model	OCV at Start of Test, Vdc	Maximum case temperature (°C)	Time interval, hours	Results
Undischarged samples				
ER14505	3.677	23.9	225	NE, NF
ER14505	3.676	23.9	225	NE, NF
ER14505	3.677	23.9	225	NE, NF
ER14505	3.677	23.7	225	NE, NF
ER14505	3.676	24.0	225	NE, NF

Supplementary information:

NC: No short-circuit
NE: No explosion
NF: No fire
NL: No leakage
NR: No rupture
NT: No excessive temperature rise
NV: No venting

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

6.5.6	Test J: Free fall	P

Model	OCV at Start of Test, Vdc	Weight before test, g	Weight after test, g	Results
Undischarged samples				
ER14505	3.678	17.317	17.316	NV, NE, NF
ER14505	3.677	17.296	17.295	NV, NE, NF
ER14505	3.678	17.304	17.303	NV, NE, NF
ER14505	3.678	17.288	17.287	NV, NE, NF
ER14505	3.678	17.324	17.322	NV, NE, NF

Supplementary information:

NC: No short-circuit
NE: No explosion
NF: No fire
NL: No leakage
NR: No rupture
NT: No excessive temperature rise
NV: No venting

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict

6.5.7	Test K: Thermal abuse	P

Model	OCV at Start of Test, Vdc	Weight before test, g	Weight after test, g	Results
Undischarged samples				
ER14505	3.677	17.273	17.221	NE, NF
ER14505	3.678	17.267	17.246	NE, NF
ER14505	3.677	17.331	17.250	NE, NF
ER14505	3.678	17.329	17.302	NE, NF
ER14505	3.677	17.276	17.253	NE, NF

Supplementary information:

NC: No short-circuit
NE: No explosion
NF: No fire
NL: No leakage
NR: No rupture
NT: No excessive temperature rise
NV: No venting

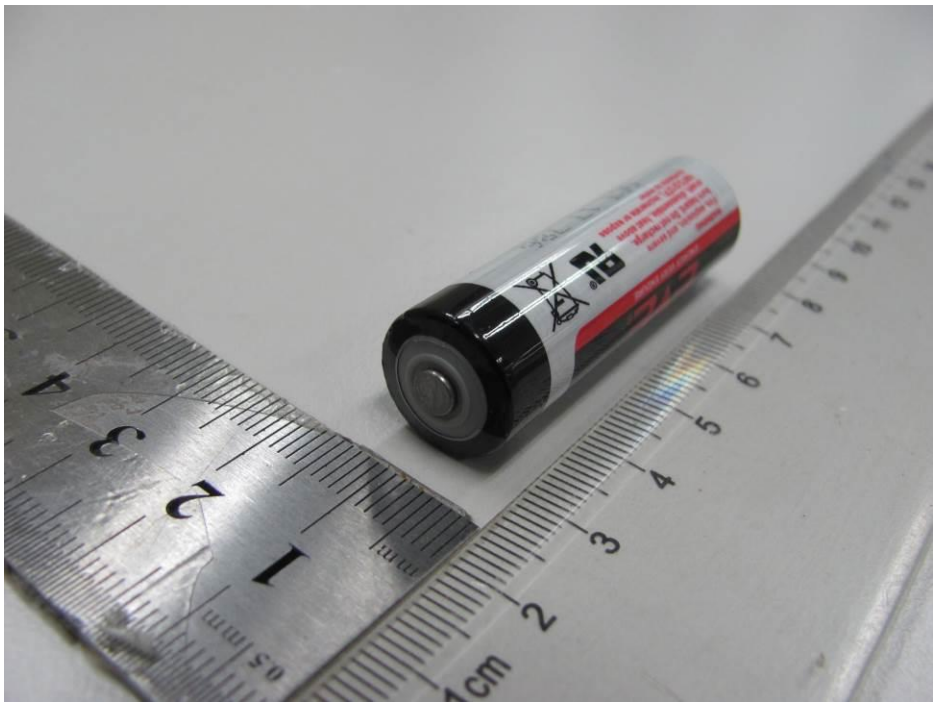
-- End of This Test Report --

Attachment No. 1
Photo Documentation

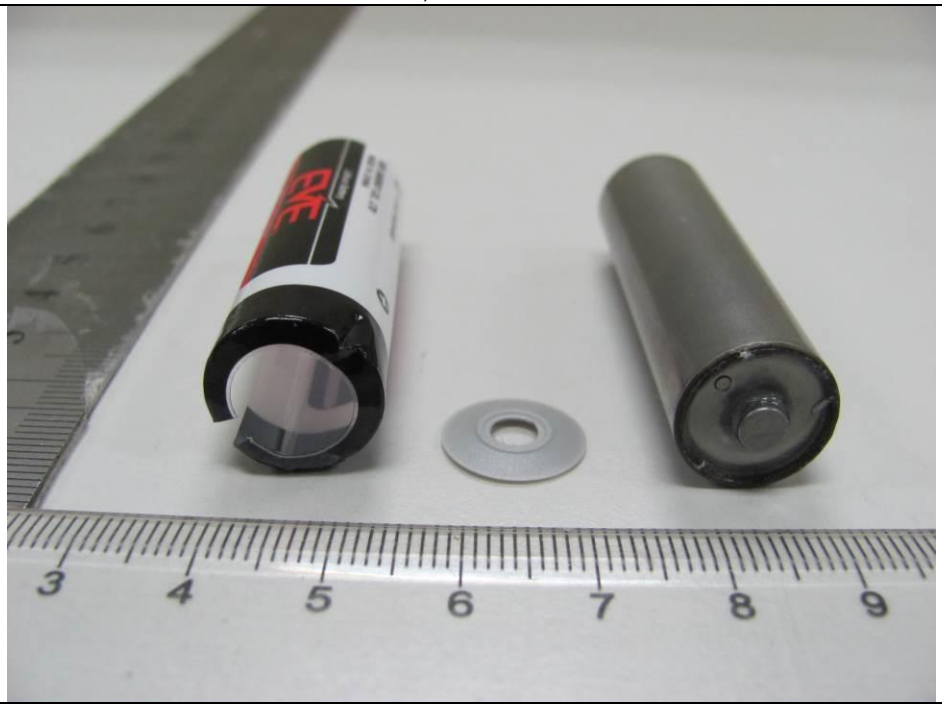
Details of:	Fig. 1 Overall view 1 of Lithium Thionyl Chloride Cell, Model No.: ER14505

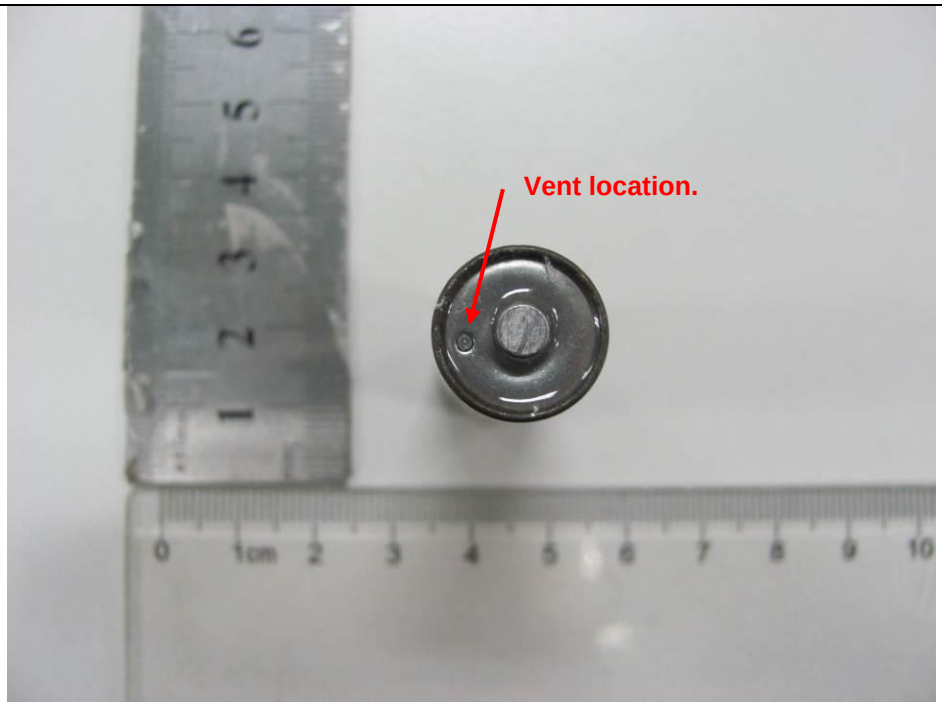
Details of:	Fig. 2 Label artwork of Lithium Thionyl Chloride Cell, Model No.: ER14505

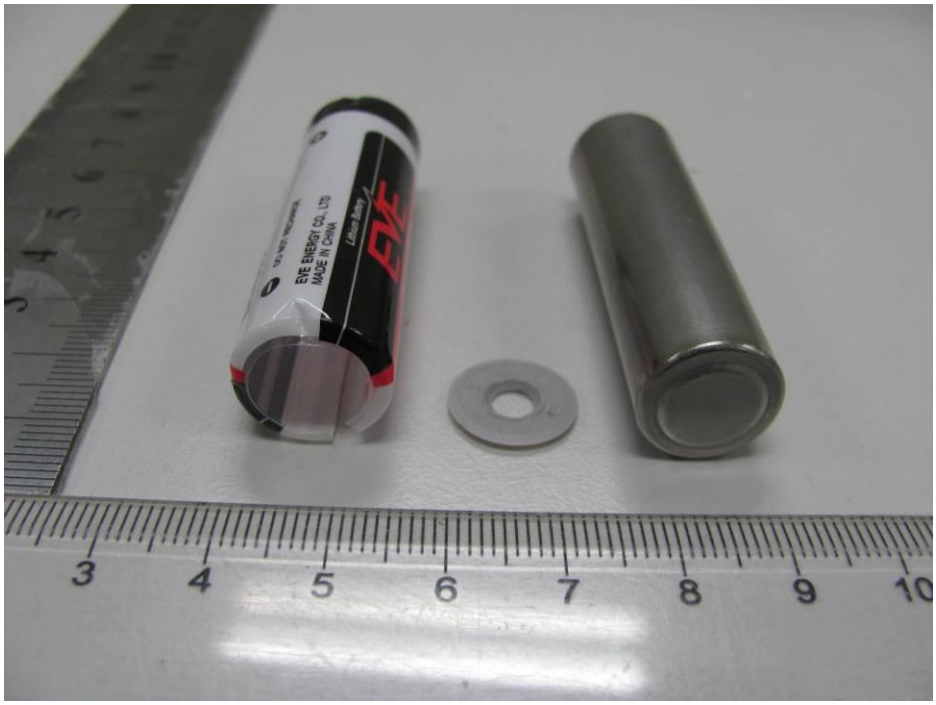
Remark:
Date code: “MM YY XX” represents the date of manufacturing.
MM=01, 02, 03…12 is for the month. “01” represents “January”, “02” represents “February”, “03” represents “March” …, “12” represents “December”.
YY=00, 01, 02… 99 is for the year, “00” is for 2000, “01” is for 2001, “02” is for 2002… “99” is for 2099.
XX=01, 02…31 is for the date. “01” is the first day in month, “02” is the second day in month, …”31” is the 31st day.

Details of:	Fig. 3 Overall view 2 of Lithium Thionyl Chloride Cell, Model No.: ER14505
	

Details of:	Fig. 4 Overall view 3 of Lithium Thionyl Chloride Cell, Model No.: ER14505
	

Details of:	Fig. 5 Overall view 1 of Lithium Thionyl Chloride Cell with heat-shrinking tube disassembled, Model No.: ER14505
	

Details of:	Fig. 6 Overall view 2 of Lithium Thionyl Chloride Cell with heat-shrinking tube removed, Model No.: ER14505
	

Details of:	Fig. 7 Overall view 3 of Lithium Thionyl Chloride Cell with heat-shrinking tube disassembled, Model No.: ER14505
	

---End of photo documentation---