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# **Certification**

☐ Lithium-ion cell or battery

model name: CR2025

Lithium metal cell or battery

C190329-7

Littiuiti Conte	<u> </u>	vvaii-nour raiing									
<b>⊄</b> cell	☐ battery(pack)	□ cell	☐ battery(pack)								
<b>♥</b> ≤ 0.3g	□ <b>≤</b> 0.3g	□ ≦ 2.7Wh	□ ≦ 2.7Wh								
□ ≦ 1g	□ ≦ 2g	□ ≦ 20Wh	□ ≦ 100Wh								
□ > 1g	□ > 2g	□ > 20Wh	□ > 100Wh								
		Nominal Voltage	V								
		Rated Capacity	mAh								
Transport tests	and results										
Test number		Results	Remarks								
T-1	Altitude		Remarks								
T-2	Thermal cycling	Accepted									
T-3	Vibration	Accepted									
T-4	Shock	Accepted									
T-5	External short circuit	Accepted									
T-6	Crush	Accepted Accepted									
T-7		· · · · · · · · · · · · · · · · · · ·	for rechargeable battery only								
		• •	lor rechargeable battery orlig								
of the UN Recomm	T-7 Overcharge Not applicable for rechargeable battery or T-8 Forced Discharge Accepted  We certify that above results are confirmed in accordance with the Manual of Tests and Criteria of the UN Recommendations on the Transport of Dangerous Goods(5th revised edition Amendment2), Part III, sub-section 38.3  Name / Title of Signatory  Takashi Kimura / Senior Manager, MD Design Deposition Signature  March 29, 2019										

Test No.				C	-1804-6									
Test		T.1: Altitude simulation												
					Appro	ved by	Checked by	Prepared by						
Item (Status)			2025 charge	ed)	-	(5,30) (1,5,30)	竹内 18.5.30	<b>申谷</b> 8.5.30 洗						
Place	Safety t	test hou	ise	Equipment No	o. P-2	3-01	Туре	Li content						
	nber of pecimen		10				Cell	0.05 g						
Perfo	rmed by			Koya nakatar	i		Battery	5.55 g						
Time and	Test time	Start	2018	8/4/5	9:15	Finish	2018/4/5	9:15						
	Temperature	Otart		20.3°C		1 1111311	20.	3°C						
tempera-	Observe time	Start	2018	8/4/5 1	5:15	Finish	2018/4/5	15:15						
ture	Temperature	Siari		20.3°C		Finish	20.3°C							
Test proce	dure			<u> </u>										

Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least 6 hours at ambient temperature (20 ± 5 °C).

# Requirements

There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

### Test result

		γ											
No.		1	2	3	4	5	6	7	8	9	10		
L	ot No.		0	0	0	0	0	0	0	0	0		
		Test tim	Test time 6 hr										
Test	condition	Pressur	Pressure: Less than 11.6kPa										
	Pre-test(V <sub>1</sub> ) [V]	3.261	3.271	3.267	3.259	3.266	3.256	3.267	3.265	3.258	3.264		
Voltage	After-test(V <sub>2</sub> ) [V]	3.263	3.262	3.267	3.269	3.264	3.267	3.262	3.265	3.262	3.265		
	Change rate <sup>*1</sup> [%]	100	100	100	100	100	100	100	100	100	100		
	Pre-test(M <sub>1</sub> ) [g]	2.462	2.455	2.469	2.477	2.472	2.462	2.470	2.465	2.467	2.466		
Mass	After-test(M <sub>2</sub> ) [g]	2.462	2.455	2.469	2.477	2.472	2.462	2.470	2.465	2.467	2.466		
	Mass loss*2 [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.		
After-	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.		
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.		
Status	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.		
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.		

\*1: Change rate[%]=V<sub>2</sub>/V<sub>1</sub> x 100 Limit Change rate: 90% \*2: Mass loss[%]=(M<sub>1</sub>-M<sub>2</sub>)/M<sub>1</sub>x 100

Mass M of cell or battery	Mass loss limit
M < 1g	0.5%
1g ≤ M ≤ 75g	0.2%
M > 75g	0.1%

Test No.				C	-1804-6									
Test		T.1: Altitude simulation												
					Appro	ved by	Checked by	Prepared by						
Item (Status)	(F	CR Fully di	2025 scharg	ged)	18	5,30	<b>将内</b> 18.5.30	中谷 18.5.30 光						
Place	Safety t	est hou	ise	Equipment N	o. P-2	3-01	Туре	Li content						
	nber of pecimen	10			<u> </u>		Cell	0.05 g						
Perfo	rmed by			Koya nakata	ni		Battery							
Time and	Test time	Start	2018	8/4/5	9:15	Finish	2018/4/5	9:15						
	Temperature	Otart		20.3°C		I IIIIOII	20.	3°C						
tempera- ture	Observe time	Start	2018	8/4/5	15:15	Finish	2018/4/5	15:15						
ture	Temperature	Start		20.3°C		FILLISH	20.3°C							
Test proce	dure													

Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least 6 hours at ambient temperature ( $20 \pm 5$  °C).

# Requirements

There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire.

# Test result

	No.	1	2	3	4	5	6	7	8	9	10		
1	ot No.	0	0	0	0	·							
<u> </u>	.OL INO.			-	U	0	0	0	0	0	0		
		Test time 6 hr											
Test	condition	Pressur	Pressure: Less than 11.6kPa										
	Pre-test(V <sub>1</sub> ) [V]	-	-	-		-	-	-	-	-	-		
Voltage	After-test(V <sub>2</sub> ) [V]	-	ı	-	•	-	-	1	-	-	-		
	Change rate <sup>*1</sup> [%]	-	-	-	-	-	1	-	-	-	-		
	Change rate*1 [%]	2.470	2.452	2.450	2.454	2.466	2.481	2.466	2.508	2.453	2.496		
Mass	After-test(M <sub>2</sub> ) [g]	2.470	2.452	2.450	2.454	2.466	2.481	2.466	2.508	2.453	2.496		
	Mass loss*2 [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.		
After-	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.		
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.		
Status	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.		
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.		

\*1: Change rate[%]= $V_2/V_1 \times 100$ Limit Change rate: 90%

\*2: Mass loss[%]=(M<sub>1</sub>-M<sub>2</sub>)/M<sub>1</sub>x 100

Mass M of cell or battery	Mass loss limit
M < 1g	0.5%
1g ≤ M ≤ 75g	0.2%
M > 75g	0.1%

							(1 0	in revision date	5.0-3an-2017)					
Test No.					<u>C-1</u>	804-6								
Test		T.2: Thermal test												
								Checked by	Prepared by					
Item (Status)		<b>2025</b> charge			18.	<b>参</b> 5,30	行内 18,5,30	中谷 18.5.30 洗						
Place	Safety t	test hou	ise	Equipm	ent No.	A-0:	2-01	Type	Li content					
	nber of pecimen	10						Cell	0.05 g					
Perfo	rmed by			Koya na	akatani			Battery	j siss g					
Time and	Test time	Start	2018	8/4/6	13:	00	Finish	2018/4/11	15:15					
	. Hemperature			_	•		7   1111811   2		0°C					
tempera- ture	Observe time	Start	2018	3/4/11	18:	00	Finiah	2018/4/12	18:45					
iule	Temperature	Start	21.2℃		Finish		21.	2°C						
Test proce	dure													

Test cells and batteries are to be stored for at least 6 hours at a test temperature equal to  $72 \pm 2$  °C, followed by storage for at least 6 hours at a test temperature equal to  $-40 \pm 2$  °C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature ( $20 \pm 5$  °C).

#### Requirements

There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

#### Test result

	-								f			
	No.	1	2	3	4	5	6	7	8	9	10	
L	.ot No.	0	0	0	0	0	0	0	0	0	0	
		Setting temperature: 72°C/-40°C										
Test	condition	Setting time: 6h										
		Setting	cycle:10									
	Pre-test(V <sub>1</sub> ) [V]	3.267	3.262	3.260	3.263	3.268	3.271	3.268	3.256	3.270	3.261	
Voltage	After-test(V <sub>2</sub> ) [V]	3.263	3.264	3.263	3.268	3.266	3.264	3.265	3.262	3.264	3.269	
	Change rate <sup>*1</sup> [%]	100	100	100	100	100	100	100	100	100	100	
	Pre-test(M <sub>1</sub> ) [g]	2.480	2.465	2.474	2.472	2.472	2.471	2.469	2.469	2.472	2.466	
Mass	After-test(M <sub>2</sub> ) [g]	2.480	2.465	2.475	2.472	2.472	2.471	2.469	2.469	2.472	2.467	
	Mass loss <sup>*2</sup> [%]	0.00	0.00	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
After-	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Status	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	

\*1: Change rate[%]=V<sub>2</sub>/V<sub>1</sub> x 100 Limit Change rate: 90%

Mass M of cell or battery	Mass loss limit
M < 1g	0.5%
1g ≤ M ≤ 75g	0.2%
M > 75g	0.1%

Test No.					C-1	804-6								
Test		T.2: Thermal test												
								Checked by	Prepared by					
Item (Status)	(F	<b>2025</b> scharc	ged)				竹内 18.5.30 恭	字谷 18.5.30 洗						
Place	Safety t	est hou	ise	Equipmen	t No.	A-0	2-01	Type	Li content					
	nber of pecimen	10					Cell	0.05 q						
Perfo	rmed by			Koya naka	atani			Battery	9					
Time and	Test time	Start	2018	8/4/6	13:	00	Finish	2018/4/11	15:15					
	. Hemperature			_			1 1111311	21.	0°C					
tempera-	Observe time	Start	2018	3/4/11	18:	00	Einich	2018/4/12	18:45					
ture	Temperature	Start		21.2°C	;	Finish		21.2°C						
Test proce	dure													

Test cells and batteries are to be stored for at least 6 hours at a test temperature equal to  $72 \pm 2$  °C, followed by storage for at least six hours at a test temperature equal to -  $40 \pm 2$  °C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature ( $20 \pm 5$  °C).

#### Requirements

There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire.

# Test result

	No.	1	2	3	1	5	6	7	8	9	10		
		<u> </u>			4		0	/	0		10		
L	.ot No.	0	0	0	0	0	0	0	0	0	0		
		Setting temperature: 72°C/-40°C											
Test	condition	Setting time: 6h											
		Setting	cycle:10										
	Pre-test(V <sub>1</sub> ) [V]	_	ı	1	-	1	_	-	1	-	-		
Voltage	After-test(V <sub>2</sub> ) [V]	-	-	-	-	-	_	-	-	-	-		
	Change rate <sup>*1</sup> [%]	-	-	-	_	1	-	-	_	-	-		
	Pre-test(M <sub>1</sub> ) [g]	2.485	2.460	2.471	2.494	2.470	2.488	2.474	2.505	2.493	2.495		
Mass	After-test(M <sub>2</sub> ) [g]	2.485	2.460	2.471	2.494	2.470	2.488	2.474	2.505	2.493	2.495		
	Mass loss*2 [%]	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.		
After-	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.		
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.		
Status	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.		
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.		

\*1: Change rate[%]=V<sub>2</sub>/V<sub>1</sub> x 100 Limit Change rate: 90%

Mass M of cell or battery	Mass loss limit
M < 1g	0.5%
1g ≤ M ≤ 75g	0.2%
M > 75g	0.1%

Test No.						804-6	· · · · · · · · · · · · · · · · · · ·					
Test					<u>3: V</u>	ibration						
						Approved by		Checked by	Prepared by			
Item (Status)		CR2025 (Undischarged)						竹内 18,5,30	中谷 (18,5,30)			
	ļ	<b>\</b>		,				恭	1			
Place	Safety t	Safety test house   Equipment No						Type	Li content			
Nun	nber of	10						(Cell)				
test s	pecimen	10						or	0.05 g			
Perfo	rmed by	Koya nakatani						Battery				
Time and	Test time	Start	2018	3/4/24	9:	)0 Finish		2018/4/24	18:00			
	Temperature	Start		20.9°C			1 1111311		2°C			
tempera-	Observe time	Start	2018/4/24		18	:00	Finish	2018/4/24	18:45			
ture	Temperature	Start	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	21.2°	C		FILISH	20.	9°C			
Test proce	dure											

Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. 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 gn is maintained until 18 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 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.

# Requirements

There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

#### Test result

								,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
	No.	1	2	3	4	5	6	7	8	9	10		
L	.ot No.	0	0	0	0	0	0	0	0	0	0		
		Vibratio	Vibration : 7Hz -200Hz-7Hz										
Test	condition	Test tim	Test time: 3 hours for each direction(x, y, z); total 9 hours										
						( , ,	. ,.						
	Pre-test(V <sub>1</sub> ) [V]	3.262	3.267	3.262	3.272	3.268	3.261	3.270	3.268	3.266	3.261		
Voltage	After-test(V <sub>2</sub> ) [V]	3.281	3.278	3.277	3.283	3.280	3.279	3.283	3.277	3.279	3.284		
	Change rate <sup>*1</sup> [%]	101	100	100	100	100	101	100	100	100	101		
	Pre-test(M <sub>1</sub> ) [g]	2.470	2.471	2.466	2.470	2.474	2.468	2.476	2.470	2.468	2.464		
Mass	After-test(M <sub>2</sub> ) [g]	2.471	2.471	2.466	2.470	2.474	2.468	2.476	2.470	2.468	2.464		
	Mass loss <sup>*2</sup> [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.		
After-	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.		
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.		
Status	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.		
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.		

\*1: Change rate[%]=V<sub>2</sub>/V<sub>1</sub> x 100 Limit Change rate: 90%

Mass M of cell or battery	Mass loss limit
M < 1g	0.5%
1g ≤ M ≤ 75g	0.2%
M > 75g	0.1%

Test No.				C	-1804-6				
Test				T.3:	Vibrati	on			
					Appro	ved by	Checked by	Prepared by	
Item (Status)	(F	CR Fully di	2025 scharç	ged)	1.000	(\$\) (\$\) (\$\) (\$\) (\$\) (\$\) (\$\) (\$\)	行内 '18.5.30 恭	中谷 18.5.30 光	
Place	Safety t	est hou	est house Equipment No.			7-01	Туре	Li content	
	nber of pecimen	10					Cell	0.05 g	
Perfo	rmed by			Koya nakatai	ni		Battery	y y	
Time and	Test time	Start	2018	3/4/24	9:00	Finish	2018/4/24	18:00	
	Temperature	Start		20.9°C		1 1111511	21.	2°C	
tempera- ture	Observe time	Start	2018	3/4/24	18:00	Finish	2018/4/24	18:45	
tule	Temperature	Siari		21.2°C		FIIIISN	20.9°C		
Test proce	dure								

Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. 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 gn is maintained until 18 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 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.

#### Requirements

There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire.

#### Test result

r	NI-				4	T	_			_	4.0	
No.		1	2	3	4	5	6	7	8	9	10	
L	ot No.	0	0	0	0	0	0	0	0	0	0	
		Vibration : 7Hz -200Hz-7Hz										
Test	condition	Test tim	ie: 3 hou	ırs for ea	ach dired	ction(x, y	, z); tota	l 9 hours	5			
	Pre-test(V <sub>1</sub> ) [V]	-	-	-	-	1	-	-	-	-	-	
Voltage	After-test(V <sub>2</sub> ) [V]	_	-	-	ı	-	-	-	-	-	-	
	Change rate*1 [%]	-	ı		-	-	•	-	-	-	-	
	Pre-test(M <sub>1</sub> ) [g]	2.476	2.458	2.479	2.465	2.476	2.461	2.437	2.480	2.444	2.461	
Mass	After-test(M <sub>2</sub> ) [g]	2.476	2.458	2.479	2.465	2.476	2.461	2.437	2.480	2.444	2.461	
	Mass loss*2 [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
After-	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Status	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	

\*1: Change rate[%]=V<sub>2</sub>/V<sub>1</sub> x 100 Limit Change rate: 90%

Mass M of cell or battery	Mass loss limit
M < 1g	0.5%
1g ≤ M ≤ 75g	0.2%
M > 75g	0.1%

Test No.					C-18	304-6		oriir revision date						
Test		T.4: Shock												
						Approved by		Checked by	Prepared by					
Item (Status)	1	CR2025 (Undischarged)						竹内 185.30	8,5,30					
Place	Safety t	Safety test house Equipment No					3-01	Туре	Li content					
	nber of pecimen	10						Cell	0.05 g					
Perfo	rmed by			Koya nakata	ani			Battery	]					
Time and	Test time	Start	2018	3/4/19	14:1	:15 Finish		2018/4/19	15:15					
	Temperature	Otart		20.1°C			1 1111311	20.	1°C					
tempera-	Observe time	2018		3/4/19	15:1	15	Finish	2018/4/19	15:45					
ture	Temperature	Start		20.1°C		Finis		20.1℃						
Test proce	dure						· · · · · · · · · · · · · · · · · · ·							

Test cells and 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 cell or battery shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Each cell or 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 cell or battery for a total of 18 shocks.

# Requirements

There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

### Test result

p						···							
	No.	1	2	3	4	5	6	7	8	9	10		
L	ot No.	0	0	0	0	0	0	0	0	0	0		
		Peak acceleration: 150 gn											
Test	condition	Pulse d	Pulse duration: 6 ms										
	Pre-test(V <sub>1</sub> ) [V]	3.280	3.281	3.280	3.282	3.280	3.281	3.281	3.278	3.280	3.283		
Voltage	After-test(V2) [V]	3.282	3.287	3.281	3.287	3.285	3.287	3.283	3.288	3.286	3.288		
	Change rate*1 [%]	100	100	100	100	100	100	100	100	100	100		
	Pre-test(M <sub>1</sub> ) [g]	2.468	2.468	2.469	2.468	2.469	2.471	2.467	2.474	2.472	2.471		
Mass	After-test(M <sub>2</sub> ) [g]	2.468	2.468	2.469	2.468	2.469	2.471	2.467	2.474	2.472	2.471		
	Mass loss*2 [%]	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.		
After-	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.		
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.		
Status	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.		
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.		

\*1: Change rate[%]=V<sub>2</sub>/V<sub>1</sub> x 100 Limit Change rate: 90%

Mass M of cell or battery	Mass loss limit
M < 1g	0.5%
1g ≤ M ≤ 75g	0.2%
M > 75g	0.1%

Test No.					C-1	804-6			
Test				Т.	4:	Shoc	k		
				Marine Ma		Approved by		Checked by	Prepared by
Item (Status)	(F	CR2025 (Fully discharged)						18,5,30	18.5.30 洗
Place	Safety t	test hou	ise	Equipment	No.	A-0	8-01	Туре	Li content
	nber of pecimen	10						Cell	0.05 g
Perfo	rmed by			Koya nakat	ani			Battery	3.55 g
Time and	Test time	Start	2018	3/4/19	14:	15	Finish	2018/4/19	15:15
	Temperature	Start		20.1°C			FIIIISII	20.	1℃
tempera-	Observe time	Start	2018	2018/4/19 15:		15	Einiah	2018/4/19	15:45
ture	Temperature	Siari		20.1°C			Finish	20.	1°C
Test proce	dure				***************************************				

Test cells and 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 cell or battery shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Each cell or 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 cell or battery for a total of 18 shocks.

#### Requirements

There is no leakage (no mass loss), no venting, no disassembly, no rupture and no fire.

# Test result

					r		<del></del>						
	No.	1	2	3	4	5	6	7	8	9	10		
L	ot No.	0	0	0	0	0	0	0	0	0	0		
		Peak acceleration: 150 gn											
Test	condition	Pulse duration: 6 ms											
	Pre-test(V <sub>1</sub> ) [V]	-	-	-	-	-	-	-	_	-	_		
Voltage	After-test(V <sub>2</sub> ) [V]	-	-	1	_	1	-	-	-	-	_		
	Change rate <sup>*1</sup> [%]	-	-	-	-	-	-		-		-		
	Pre-test(M <sub>1</sub> ) [g]	2.466	2.479	2.486	2.492	2.481	2.440	2.480	2.460	2.477	2.486		
Mass	After-test(M <sub>2</sub> ) [g]	2.466	2.479	2.486	2.492	2.481	2.440	2.480	2.460	2.477	2.486		
	Mass loss*2 [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00		
	Leakage	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.		
After-	Venting	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.	N.V.		
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.		
Status	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.		
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.		

\*1: Change rate[%]= $V_2/V_1 \times 100$ Limit Change rate: 90%

Mass M of cell or battery	Mass loss limit
M < 1g	0.5%
1g ≤ M ≤ 75g	0.2%
M > 75g	0.1%

Test No.				C	-1804-6				
Test			T	.5: Exteri	nal sho	ort circ	cuit		
					Appro	oved by	Checked by	Prepared by	
Item (Status)		<b>CR</b> (Undis	2025 charge	ed)	18	多 5,30 七	份内 18.5.30 恭	中谷(8,5,30) 洸	
Place	Safety t	est hou	ise	Equipment N	o. A-0	2-30	Type	Li content	
	nber of pecimen			10			Cell	0.05 g	
Perfo	rmed by			Koya nakata	ni		Battery	9	
Time and	Test time	Start	2018	3/4/24	9:00	Finish	2018/4/24	16:00	
	Temperature	Otart		20.9°C		1 1111311	21.2°C		
tempera-	Observe time	2018		3/4/24	16:00	Finish	2018/4/25	9:00	
ture	Temperature	mperature Start 21.2°C				rinish	21.3°C		
Test proc	edure								

The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches  $55 \pm 2$  °C 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  $55 \pm 2$  °C. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to  $55 \pm 2$  °C. The cell or battery must be observed for a further six hours for the test to be concluded.

# Requirements

Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire within six hours of this test.

### Test result

	No.	1	2	3	4	5	6	7	8	9	10		
L	ot No.	0	0	0	0	0	0	0	0	0	0		
		Setting	Temper	ature of	chambe	r: 55°C							
Test	condition	Resista	Resistance: Less than 0.10hm										
Voltage	Pre-test [V]	3.291	3.285	3.288	3.281	3.281	3.286	3.284	3.290	3.283	3.286		
Mass	Pre-test [g]	2.462	2.473	2.465	2.463	2.472	2.459	2.459	2.462	2.464	2.468		
Max. Ter	nperature (°C)	57.1	57.5	57.8	57.5	57.4	57.3	55.9	56.8	57.0	56.5		
	Leakage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
After-	Venting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.		
Status	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.		
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.		

Test No.					-1804-6				
Test			Т	.5: Exteri	nal sho	rt circ	cuit		
					Appro	ved by	Checked by	Prepared by	
Item (Status)	(1	<b>CR</b> Fully di	2025 scharg	ged)	\$ man	(A) (B) (5) (3) (本)	18,5.30	海 30 洪	
Place	Safety t	test hou	ıse	Equipment N	o. A-0	2-30	Туре	Li content	
	nber of pecimen			10			Cell	0.05 g	
Perfo	rmed by			Koya nakata	ni		Battery	3.33 g	
Time and	Test time	Start	2018	3/4/24	9:00	Finish	2018/4/24	16:00	
tempera-	Temperature	Otart		20.9°C		1 1111511	21.2°C		
ture	Observe time	Start	2018	3/4/24	16:00	Finish	2018/4/25	9:00	
ture	Temperature	e Start 21.2°C				rinish	21.3°C		
Test proce	edure								

The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches  $55 \pm 2$  °C 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  $55 \pm 2$  °C. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to  $55 \pm 2$  °C. The cell or battery must be observed for a further six hours for the test to be concluded.

# Requirements

Test result

Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire within six hours of this test.

	No.	1	2	3	4	5	6	7	8	9	10	
Lot No.		0	0	0	0	0	0	0	0	0	0	
Test condition		Setting	Setting Temperature of chamber: 55°C									
		Resista	Resistance: Less than 0.1ohm									
Voltage	Pre-test(V <sub>1</sub> ) [V]	-	-	-	-	_	-	-	-	-	-	
Mass	Pre-test(M <sub>1</sub> ) [g]	2.464	2.474	2.504	2.470	2.462	2.488	2.451	2.451	2.486	2.472	
Max. Ter	nperature (°C)	55.5	55.4	55.1	55.8	55.5	55.4	55.2	55.5	55.6	55.2	
	Leakage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
After-	Venting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Status	Rupture	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	

N.F.

N.F.

N.F.

N.F.

N.F.

N.F.

N.F.

Fire

N.F.

N.F.

N.F.

Compliant with 5th revised edition Amendment 1 (Revision date : 1-Jan-2013)

Test			P	T.6:	Crusl	h			
					Appro	ved by	Checked by	Prepared by	
Item (Status)		CR	2025		(13.12.03)		1312 3	1312.02	
(Otatao)		(Undis	charged)		13.12.03				
Place			Safety test house	)			Nominal Voltage	Rated Capacity	
1	nber of pecimen		5				3.0V	170mAh	
Perfo	rmed by		Atsushi Ya			3.0 V	170mAn		
Time and	Test time	Start		1:45		Finish	2013/12/2	12:15	
l Lemperature		O	22.0°	$^{\circ}$		1 1111311	21.5℃		
tempera- ture	Observe time	Start	2013/12/2 1	2:15		Finish	2013/12/2	18:15	
lule	Temperature	Start	21.5℃				19.5℃		
Test proc	edure								

A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.

- (a) The applied force reaches 13 kN  $\pm$  0.78 kN;
- (b) The voltage of the cell drops by at least 100 mV; or
- (c) The cell is deformed by 50% or more of its original thickness.

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.

A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis. Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.

#### Requirements

Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly and no fire within six hours of this test.

#### Test result

			r	r					·	<b>r</b>	
	No.	1	2	3	4	5	6	7	8	9	10
L	.ot No.	130906	130906	130906	130906	130906					
		Crushin	g speed	: 1.5cm	/s	.,,,					
Test	condition	Ram dia	ameter:	32	mm	Pre	essure:	13KN (	17	Mpa	)
		Directio	Direction of the force : Widest side								
Force	Peak (kN)	15.000	15.000	15.000	15.000	15.000					
	Pre-test(V <sub>1</sub> ) [V]	3.261	3.264	3.259	3.263	3.258					
Voltage	After-test(V <sub>2</sub> ) [V]	3.257	3.251	3.248	3.260	3.246					
	Drop*1 [V]	0.004	0.013	0.011	0.003	0.012					
Mass	Pre-test [g]	-	ı	1	1	-					
Thick-	Pre-test(T <sub>1</sub> ) [mm]	2.464	2.435	2.461	2.471	2.433					
ness	After-test(T <sub>2</sub> ) [mm]	2.471	2.446	2.469	2.478	2.449					
11033	Change rate*2 [%]	100%	100%	100%	100%	101%					
Max. Ter	mperature (°C)	30°C<	30°C<	30°C<	30°C<	30°C<					
	Leakage	N/A	N/A	N/A	N/A	N/A					
After-	Venting	N/A	N/A	N/A	N/A	N/A					
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.					
Status	Rupture	N/A	N/A	N/A	N/A	N/A					
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.					
*4 5	*4 5 6 3 7 3 7	1 1111	, ,,,, ,		*0 01		F0/1 T0/				

<sup>\*1:</sup> Drop\*1 [V]=V<sub>1</sub>-V<sub>2</sub>

<sup>\*2:</sup> Change rate[%]=T2/T1 x 100

(Revision date: 1-Jan-2013)

		T.6: Crush									
				Appro	ved by	Checked by	Prepared by				
	CR	2025				4543 A	13.12.02				
(F	ully di	scharged)		3	and the second s	10 C V					
		Safety test house	Э		Nominal Voltage	Rated Capacity					
ber of ecimen		5			2.01/	170mAh					
med by		Atsushi Ya	amano			3.00	TrumAn				
Test time	Start	2013/12/1 1	3:00		Einich	2013/12/1	13:30				
me and Temperature		21.0	°C		1 1111511	21.0°C					
Observe time	Start	2013/12/1 1	3:30		Einich	2013/12/2	18:15				
Temperature	e Start 21.0°C			Finis		19.5°C					
r	Der of ecimen med by  Test time  Temperature  Dbserve time	(Fully dispersion of the color	CR2025  (Fully discharged)  Safety test house over of ecimen med by  Fest time Temperature Disserve time Temperature Start Temperature Start Temperature Temperature Temperature Start Temperature Tem	CR2025           (Fully discharged)           Safety test house           per of ecimen         5           med by         Atsushi Yamano           Test time Temperature         Start         2013/12/1         13:00           Dbserve time Temperature         Start         2013/12/1         13:30           Temperature         Start         2013/12/1         13:30           Temperature         Start         2013/12/1         13:30	CR2025   Approx	Approved by   CR2025   (Fully discharged)   Safety test house   Safety test house	Approved by   Checked by				

A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.

- (a) The applied force reaches 13 kN  $\pm$  0.78 kN;
- (b) The voltage of the cell drops by at least 100 mV; or
- (c) The cell is deformed by 50% or more of its original thickness.

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.

A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis. Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.

#### Requirements

Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly and no fire within six hours of this test.

#### Test result

							·				
	No.	1	2	3	4	5	6	7	8	9	10
L	ot No.	130906	130906	130906	130906	130906					
		Crushin	g speed	: 1.5cm	/s						
Test	condition	Ram dia	ameter:	32	mm	Pre	essure:	13KN (	17	Мра	)
		Directio	Direction of the force : Widest side								
Force	Peak (kN)	15.000	15.000	15.000	15.000	15.000					
	Pre-test(V <sub>1</sub> ) [V]	2.841	2.815	2.845	2.811	2.865					
Voltage	After-test(V <sub>2</sub> ) [V]	2.827	2.801	2.836	2.801	2.855					
	Drop*1 [V]	0.014	0.014	0.009	0.010	0.010					
Mass	Pre-test [g]	-	-	-	•	ı					
Thick-	Pre-test(T <sub>1</sub> ) [mm]	2.431	2.429	2.444	2.461	2.471					
ness	After-test(T <sub>2</sub> ) [mm]	2.441	2.438	2.451	2.479	2.484					
	Change rate <sup>*2</sup> [%]	100%	100%	100%	101%	101%					
Max. Ter	nperature (°C)	30°C<	30°C<	30°C<	30°C<	30°C<					
	Leakage	N/A	N/A	N/A	N/A	N/A					
After-	Venting	N/A	N/A	N/A	N/A	N/A					
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.					
Status	Rupture	N/A	N/A	N/A	N/A	N/A					
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.					

<sup>\*1:</sup> Drop\*1 [V]=V<sub>1</sub>-V<sub>2</sub>

\*2: Change rate[%]=T2/T1 x 100

Test No.					C-18	04-6				
Test				T.8: For	ced	dis	charg	е		
						Appro	ved by	Checked by	Prepared by	
Item (Status)	(F		2025 schar			(18,	5,30 5	竹内 (18,5,30) 恭	中谷 (8,5,30 洗	
Place	Safety t	test hou	ise	Equipment N	Vo.	E-0	7-27	Туре	Li content	
	nber of pecimen	10						Cell	0.05 g	
Perfo	rmed by	Koya nakatani						Battery	j 5.55 g	
Time and	Test time	Start	2018	3/4/24	9:30	0 Finish		2018/4/25	10:30	
tempera-	Temperature	Start		21.1℃			FIIIISII	20.5℃		
ture	Observe time	Start	2018	3/4/25	10:30	0	Finish	2018/5/7	9:00	
iui C	Temperature	Start		20.5°C			Finish	21.0℃		
Test proce	edure				***************************************				·	

Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12 V 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).

#### Requirements

There is no disassembly and no fire during the test and within seven days of the test.

#### Test result

	No.	1	2	3	4	5	6	7	8	9	10
L	ot No.	0	0	0	0	0	0	0	0	0	0
Test	condition	1	-	ent: 7m. ge time:							
Voltage	Pre-test [V]	-	_	_	-	-	-	-	_	-	-
Mass	Pre-test [g]	-	-	-	-	-	-	-	_	-	-
	Leakage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
After-	Venting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
test	Disassembly	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Status	Rupture	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Fire	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.	N.F.