Prüfbericht-Nr.: *Test report no.*:	**CN24OIIU 001**	**Auftrags-Nr.:** *Order no.*:	48253943	Seite 1 von 10 *Page 1 of 10*
Kunden-Referenz-Nr.: *Client reference no.*:	N/A	**Auftragsdatum:** *Order date:*	2024-10-16	
Auftraggeber: *Client*:	ProLogium Technology Co., Ltd. No.6-1,Ziqiang 7th Rd., Zhongli Dist., Taoyuan City 320, Taiwan			
Prüfgegenstand: *Test item*:	Rechargeable lithium-ceramic battery cell			
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	LLCB044221542ABUA			
Auftrags-Inhalt: *Order content*:	Service of test report			
Prüfgrundlage: *Test specification*:	As specified by client, refer to the following pages			

Wareneingangsdatum: *Date of sample receipt*:	2024-12-02
Prüfmuster-Nr.: *Test sample no:*	A003881421-001
Prüfzeitraum: *Testing period*:	2024-12-02 - 2024-12-04
Ort der Prüfung: *Place of testing*:	See following pages
Prüflaboratorium: *Testing laboratory:*	Taoyuan Testing Laboratories
Prüfergebnis*: *Test result**:	N/A

zusammengestellt von:
Compliled by:

X

Signed by: Bruce C.C. Tsai

Datum:
Date: 2024-12-11

Stellung / Position: Project Engineer

genehmigt von:
authorized by:

X

Signed by: Dennis H. P. Chiu

Ausstellungsdatum:
Issue date: 2024-12-11

Stellung / Position: Authorizer

Sonstiges /
Other:

Zustand des Prüfgegenstandes bei Anlieferung:
Condition of the test item at delivery: Prüfmuster vollständig und unbeschädigt
Test item complete and undamaged

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g.	N/A = nicht anwendbar	N/T = nicht
** Legend:*	*P(ass) = passed a.m. test*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.
This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.

Prüfbericht-Nr.: CN24OIIU 001
Test report no.:

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.* *Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. *Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.* *Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.*
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. *The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.*

TEST REPORT	
Applicant's name..... :	ProLogium Technology Co., Ltd.
Address ..... :	No.6-1,Ziqiang 7th Rd., Zhongli Dist., Taoyuan City 320, Taiwan
Test specification:	
Standard..... :	As specified by client, refer to the following pages
Test procedure ..... :	Test Report
Test item description .....:	Rechargeable lithium-ceramic battery cell
Trade Mark..... :	N/A
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	LLCB044221542ABUA
Ratings ..... :	DC 3.43 V, 124.4 Ah

List of Attachments:

- Photo Documentation (3 pages)

Tests performed (name of test and test clause):	**Testing location:**
• All applicable tests described in test report have been performed, see the following pages for the test items. • Test methods and conditions are specified by the applicant.	TÜV Rheinland Taiwan Ltd., Taoyuan Testing Laboratories 4F-1, No. 38, Huaya 1st Road, Guishan District, Taoyuan City 333 Taiwan

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..... :	See page 1
Date(s) of performance of tests..... :	See page 1

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

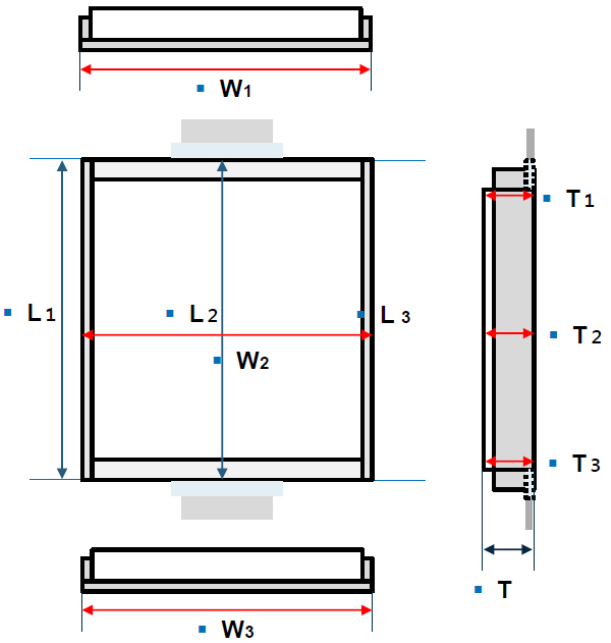
Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Name and address of factory (ies) ..... :	ProLogium Technology Co., Ltd. No.6-1,Ziqiang 7th Rd., Zhongli Dist., Taoyuan City 320, Taiwan

General product information:

- **Product specification**

Item:	Specification
Model:	LLCB044221542ABUA
Nominal voltage (Vdc):	3.43
Nominal capacity (Ah):	124.4
End of discharge voltage (Vdc):	4.2
Maximum charge voltage (Vdc):	2.5
Standard charge current (A):	CC-CV (Constant current & constant voltage), Charging current: 1/3 C rate, Charging voltage: 4.2 V, Cut-off current: 0.05 C rate
Cell weight (g) (Nominal)	CC (Constant current), Discharging current: 1/3 C rate, Cut-off voltage: 2.5 V
Cell dimension (mm) (Nominal)	Approx. 1.232

Clause	Requirement + Test	Result - Remark	Verdict
1	**Energy density measurement**		—
1.1	**Dimension and mass measurement:**		—
	a) Mass measurement: Unless otherwise stated in this document, the mass of a cell is measure at room ambient temperature of 25 °C ± 2 °C.		—
	b) Dimension measurement: Unless otherwise stated in this document, the maximum dimension of the total width, length and thickness of a cell is measure at room ambient temperature of 25 °C ± 2 °C. Step 1: Measured the overall dimension and mass of the cell. Step 2: Rest the cell for 1 h. Step 3 The cell is charged at by using the constant current of 0.2 C rate (24.88 A) and constant voltage of 4.2 V, until the charging current is reduced to 0.05 C rate (6.22 A). Step 4: Measured the overall dimension and mass of the cell after charging. The dimension measurement method specified by the applicant as follows: Overall dimension:  Key: L: The average of the lengths of L1, L2 and L3 W: The average of the widths of W1, W2 and W3 T: The average of the thickness of T1, T2 and T3		—

Clause	Requirement + Test	Result - Remark	Verdict
1.2	**Capacity measurement:**		—
	Unless otherwise stated in this document, all the following tests are carried out in an ambient temperature of 25 °C ± 2 °C. Capacity of cell is measured according to the method declared by the manufacturer as follows: Step 1: Rest the cell for 1 h. Step 2: The cell was discharged at a constant current of 0.2 C rate (24.88 A), down to the specified final voltage (2.5 V). Step 3: Rest the cell for 15 min. Step 4: The cell is charged at by using the constant current of 0.2 C rate (24.88 A) and constant voltage of 4.2 V, until the charging current is reduced to 0.05 C rate (6.22 A). Step 5: Rest the cell for 15 min. Step 6: The cell was discharged at a constant current of 0.2 C rate (24.88 A), down to the specified final voltage (2.5 V). Step 7 Calculate the discharge capacity of step 6 of cell expressed in Ah, by multiplying the discharge current (A) with the discharge duration (h). Step 8: Measured the overall dimension and mass of the cell after discharging.		—
1.3	**Calculation of energy density**		—
1.3.1	Energy density per unit volume		—
	Volumetric power density is calculated according to the following equation: $Volumetric\ energy\ density\ (Wh/L) = \frac{Nominal\ voltage\ (V)\ x\ Measured\ capacity\ (Ah)}{Avg.\ length\ (L)\ x\ Avg.\ width\ (W)\ x\ Avg.\ thickness\ (T)}$ Note: The volume of the cell dimension is the agerage of dimensions measured in clause 1.1 b), step 4		—
1.3.2	Energy density per unit mass		—
	Mass power density is calculated according to the following equation: $Mass\ energy\ density\ (Wh/kg) = \frac{Nominal\ voltage\ (V)\ x\ Measured\ capacity\ (Ah)}{Mass\ of\ cell\ (kg)}$ Note: The volume of the cell mass is the mass measured in clause 1.1 b), step 4		—

Clause	Requirement + Test	Result - Remark	Verdict

1.1	TABLE: Dimension and mass measurement				
Model / Sample no.	Dimension measurement (mm)				Mass (g)
	Position	Length (L)	Width (W)	Thickness (T)	
LLCB044221542ABUA / 001	**Test condition: refer to 1.1 b) step 4**				1245.6
	1	543	221	4.60	
	2	543	220	4.56	
	3	543	221	4.65	
	Average	543	220.7	4.60	
LLCB044221542ABUA / 001	**Test condition: refer to 1.2 step 9**				1245.6
	1	542	220	4.31	
	2	542	219	4.46	
	3	542	220	4.29	
	Average	542	219.7	4.35	
Supplementary information:					

1.2	TABLE: Capacity measurement					
Model / Sample no.	Ambient temperature (°C)	Fully charged voltage (V)	Charge current (A)	End-of-discharge voltage (V)	Discharge current (A)	Measured Capacity (Ah)
Test condition: refer to 1.2 step 6						
LLCB044221542ABUA / 001	24.6	--	24.88	2.5	24.88	130.44
Supplementary information:						

1.3	TABLE: Calculation of energy density							
Model / Sample no.	Nominal voltage (V)	Measured capacity (Ah) [1)]	Average dimension (mm) [2)]			Mass (g) [2)]	Energy density per unit volume (Wh/l)	Energy density per unit mass (Wh/kg)
			length (L)	width (W)	thickness (T)			
LLCB044221542ABUA / 001	3.43	130.44	543	220.7	4.60	1245.6	811.6	359.2

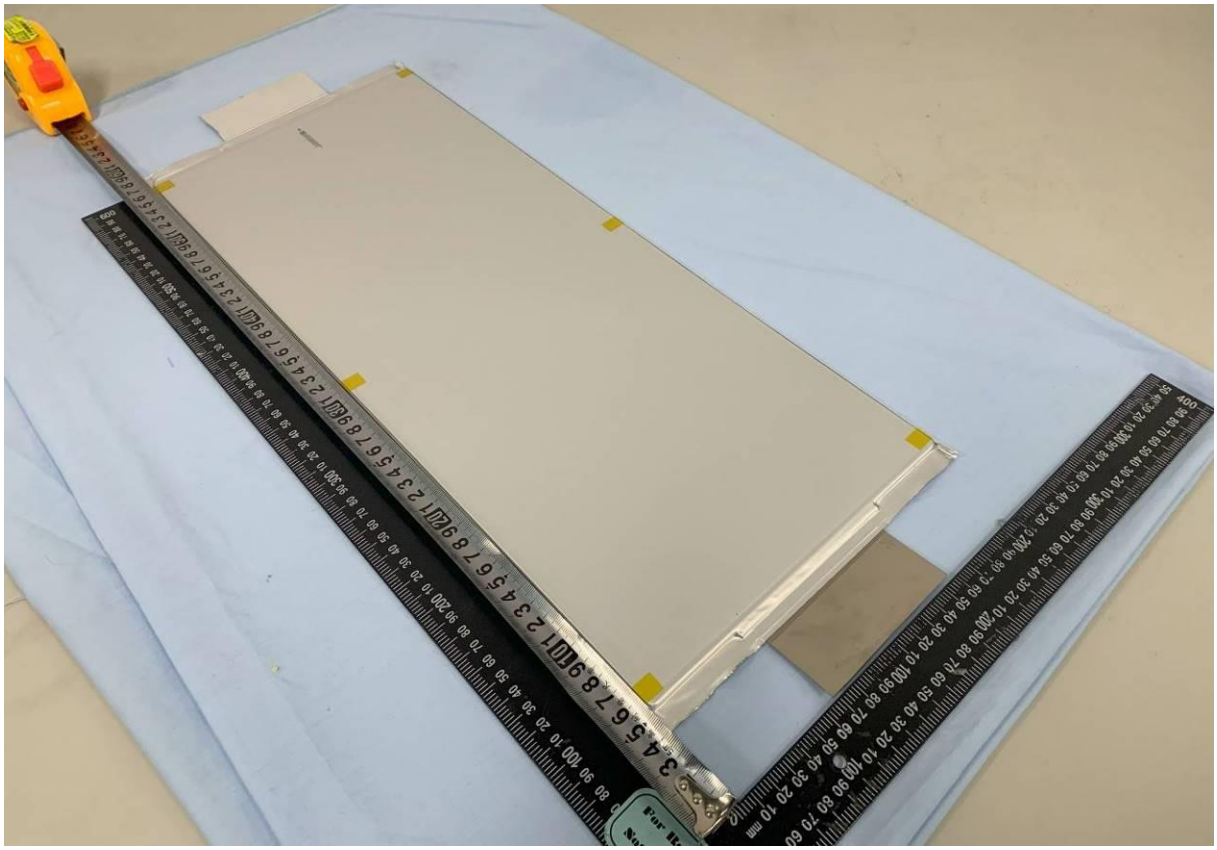
Supplementary information:

1. Discharge capacity measured in 1.2 step 6
2. Dimension and mass measurement measured in 1.1 b) step 4

Product: Rechargeable lithium-ceramic battery cell

Type Designation: LLCB044221542ABUA

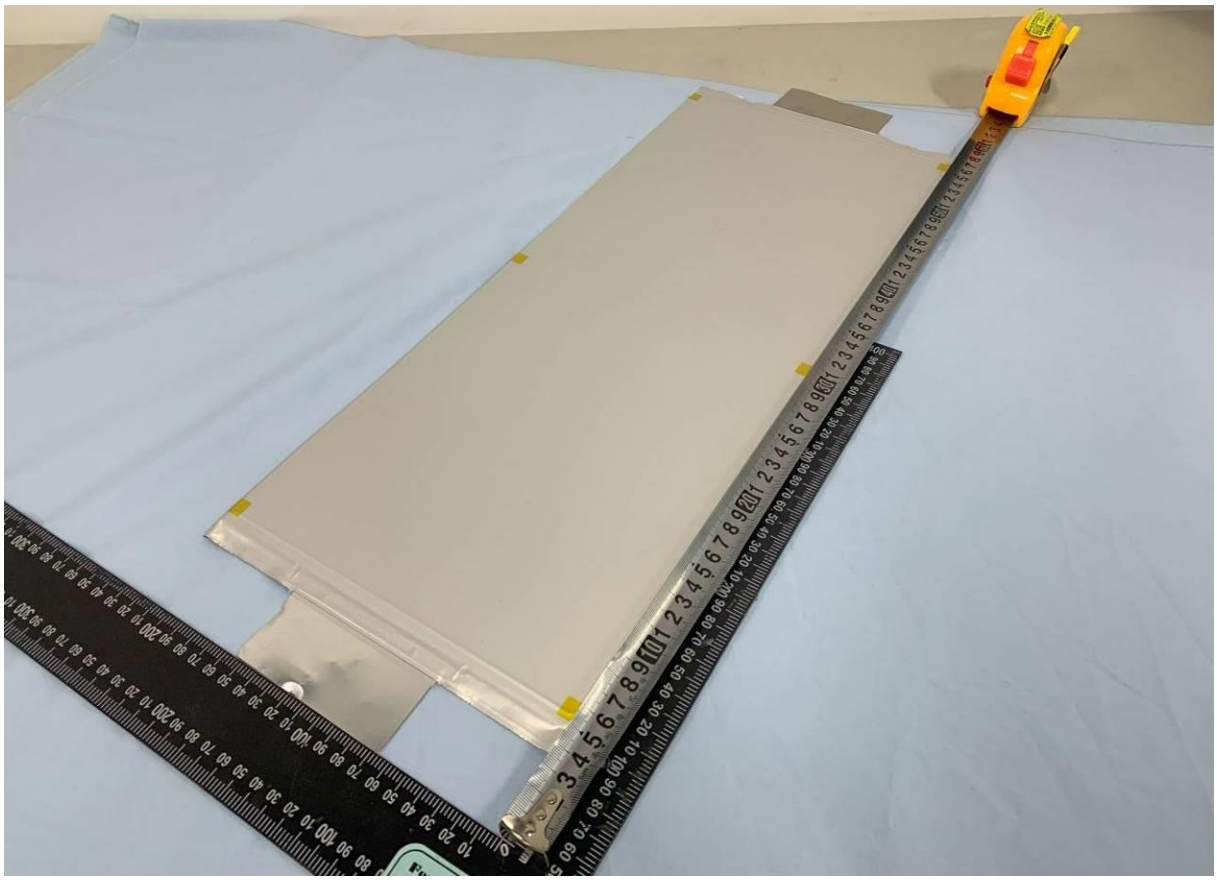
Before test



Product: Rechargeable lithium-ceramic battery cell

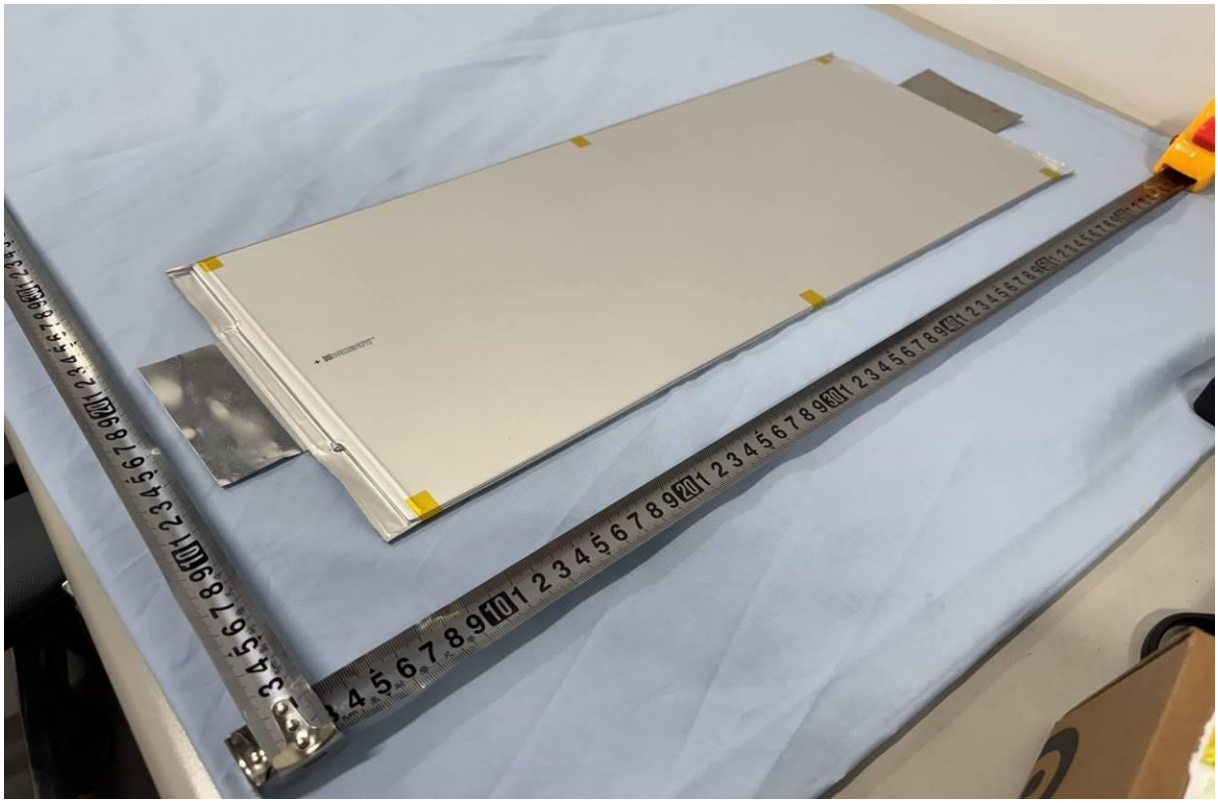
Type Designation: LLCB044221542ABUA

Before test



Product:	Rechargeable lithium-ceramic battery cell
Type Designation:	LLCB044221542ABUA

After test



- End of Test report –