1. General Information

1.1 Scope

This product specification defines the requirements of the rechargeable lithium ion battery to be supplied to the customer by LG Chem.

1.2 Application: Light Electric Vehicle

1.3 Product classification: Cylindrical rechargeable lithium ion battery

1.4 Model name: INR18650 M26

2. Nominal Specification

Item	Condition / Note	Specification
2.1 Capacity	Std. charge / discharge (Refer to 4.1.1./ 4.1.2)	Nominal 2,600 mAh (C_{nom})
		Minimum 2,500 mAh (C_{min})
2.2 Nominal Voltage	Average for Std. discharge	3.65V
2.3 Standard Charge (Refer to 4.1.1)	Constant current Constant voltage End condition(Cut off)	0.5C (1,250mA) 4.2V 50mA
2.4 Max. Charge Voltage		4.2V
2.5 Max. Charge Current		1.0C(2,500mA)
2.6 Standard Discharge (Refer to 4.1.2)	Constant current End voltage(Cut off)	0.2C (500mA) 2.75V
2.7 Max. Discharge Current		10A
2.8 Max. Temperature Limit	Max. discharge current at RT	75℃
2.9 Weight	Approx.	44.0 g
2.10 Operating Temperature	Charge Discharge	0 ~ 45℃ -20 ~ 60℃
2.11 Storage Temperature (for shipping state)	1 month 3 month 1 year	-20 ~ 60℃ -20 ~ 45℃ -20 ~ 20℃

3. Appearance and Dimension

3.1 Appearance

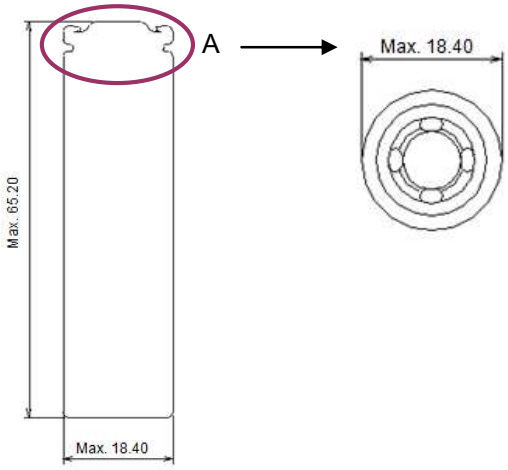
There shall be no such defects as deep scratch, crack, rust, discoloration or leakage, which may adversely affect the commercial value of the cell.

3.2 Dimension

Diameter : Max. 18.4 mm

Diameter is defined as the largest data value measured on the “A” area of a cylindrical cell.

Height : 65.0 ± 0.2 mm (Max. 65.2 mm)



4. Performance Specification

4.1 Standard test condition

4.1.1 Standard Charge

Unless otherwise specified, “Standard Charge” shall consist of charging at constant current of 1,250mA. The cell shall then be charged at constant voltage of 4.2V while tapering the charge current. Charging shall be terminated when the charging current has tapered to 50mA. For test purposes, charging shall be performed at 25ºC ± 2ºC.

4.1.2 Standard Discharge

“Standard Discharge” shall consist of discharging at a constant current of 500mA to 2.75V. Discharging is to be performed at 25 ºC ± 2 ºC unless otherwise noted (such as capacity versus temperature).

4.1.3 Fast Charge / discharge condition

Cells shall be charged at constant current of 1,250mA to 4.2V with end current of 125mA. Cells shall be discharged at constant current of 2,500mA to 3.0V. Cells are to rest 30 minutes after charge and 30 minutes after discharge.

4.2 Electrical Specification

Item	Condition	Specification
4.2.1 Initial AC Impedance	Cell shall be measured at 1kHz after charge per 4.1.1.	≤ 60 mΩ
4.2.2 Initial Capacity	Cells shall be charged per 4.1.1 and discharged per 4.1.2 within 1h after full charge.	C_{ini} ≥ 2,500 mAh (C_{min})
4.2.3 Cycle Life	Cells shall be charged and discharged per 4.1.3, 500 cycles. A cycle is defined as one charge and one discharge. 501st discharge capacity shall be measured per 4.1.1 and 4.1.2	≥ 70 % (of C_{min} in 2.1)

4.3 Environmental specification.

Item	Condition	Specification
4.3.1 Storage Characteristics	Cells shall be charged per 4.1.1 and stored in a temperature-controlled environment at 25ºC ± 2ºC for 30 days. After storage, cells shall be discharged per 4.1.2 to obtain the remaining capacity.*	Capacity remaining rate ≥ 90% of C_{min} in 2.1
4.3.2 High Temperature Storage Test	Cells shall be charged per 4.1.1 and stored in a temperature-controlled environment at 60ºC for 1 week. After storage, cells shall be discharged per 4.1.2 and cycled per 4.1.3 for 3 cycles to obtain recovery capacity*.	No leakage, Capacity recovery rate ≥ 80% of C_{min} in 2.1
4.3.3 Thermal Shock Test	65ºC (8h) ← 3hrs → -20ºC (8h) for 8 cycles with cells charged per 4.1.1 After test, cells are discharged per 4.1.2 and cycled per 4.1.3 for 3 cycles to obtain recovery capacity.	No leakage Capacity recovery rate ≥ 80% of C_{min} in 2.1
4.3.4 Temperature Dependency of	Cells shall be charged per 4.1.1 at 25ºC ± 2ºC and discharged per 4.1.2 at the following temperatures.	

* Remaining Capacity : After storage, cells shall be discharged with Std. condition(4.1.2) to measure the remaining capacity.
** Recovery Capacity : After storage, cells shall be discharged with fast discharge condition(4.1.3), and then cells shall be charged with std. charge condition(4.1.1), and then discharged with Std. condition(4.1.2). This charge / discharge cycle shall be repeated three times to measure the recovery capacity.

Capacity	Charge	Discharge	Capacity
	25℃	-10℃	70% of C_{min}
		0℃	80% of C_{min}
		25℃	100% of C_{min}
		60℃	95% of C_{min}

4.4 Mechanical Specification

Item	Condition	Specification
4.4.1 Drop Test	Cells charged per 4.1.1 are dropped onto an oak board from 1 meter height for 1 cycle, 2 drops from each cell terminal and 1 drop from side of cell. (Total number of drops =3).	No leakage No temperature rising
4.4.2 Vibration Test	Cells charged per 4.1.1 are vibrated for 90 minutes per each of the three mutually perpendicular axes (x, y, z) with total excursion of 0.8mm, frequency of 10Hz to 55Hz and sweep of 1Hz change per minute.	No leakage

4.5 Safety Specification

Item	Condition	Specification
4.5.1 Overcharge Test	Cells are discharged per 4.1.2, then charged at constant current of 3 times the max. charge condition and constant voltage of 4.2V while tapering the charge current. Charging is continued for 7 hours (Per UL1642).	No explode, No fire
4.5.2 External Short - Circuiting Test	Cells are charged per 4.1.1, and the positive and negative terminal is connected by a 100mΩ-wire for 1 hour (Per UL1642).	No explode, No fire
4,5.3 Overdischarge Test	Cells are discharged at constant current of 0.2C to 250% of the minimum capacity.	No explode, No fire
4.5.4 Heating Test	Cells are charged per 4.1.1 and heated in a circulating air oven at a rate of 5ºC per minute to 130ºC. At 130ºC, oven is to remain for 10 minutes before test is discontinued (Per UL1642).	No explode, No fire