



Specification Approval Sheet

Name : Rechargeable Cylindrical Cell (Ni-MH)

Model : NM-3S1P-4.5M

SPEC : 3.6V / 4500mAh

Number: NM-3S1P-4.5M

Specification Modification Records

Modification Time	Descriptions	Issued Date	Approved By
	Release 1	2025-01-08	

Content

This specification describes the Product Specification of Rechargeable Cylindrical Cell (Ni-MH) produced by AKYGA.

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1.SCOPE

This specification is applied to the reference battery in this Specification and manufactured by Akyga Battery

2.BATTERY MODEL

NM-3S1P-4.5M

3.EXTERNAL APPEARANCE

The cell / battery shall be free from cracks, scars, breakage, rust, discoloration, leakage and deformation.

4.RATINGS

Item	Unit	Specification	Conditions
Nominal Voltage	V	3.6V	Pack unit
Nominal Capacity	mAh	4500	Standard charge /discharge
Minimum Capacity	mAh	4500	
Standard charge	mA	450 (0.1C)	Ta=20±5°C
	hour	16	
Quick Charge	mA	2250 (0.5C)	Ambient Temperature Ta=10-40°C, -ΔV=15mV/Pack
	hour	2.4	
Trickle charge	mA	0.02C-0.05C	Ta=0-40°C
Standard discharge	mA	900 (0.2C)	Ta=20±5°C Humidity 65±20% Discharge by 0.2C to 3.0V/Pack
Maximum Discharge Current	mA	4500 (1C)	Ta=-20 ~ 60°C ; 3.0V/ Pack cut off
Storage temperature	°C	-20°C~25 within 1 year -20°C~35 within 6 months -20°C~45 within 1 month -20°C~55 within 1 week	Relative humidity: 65±20%
Weight	g	Approx250.0	Pack unit

5. PERFORMANCE

Unless otherwise stated, tests should be done within one month of delivery under the following conditions:

Ambient Temperature $20\pm 5^{\circ}\text{C}$ Relative Humidity $65\pm 20\%RH$

Notes : Standard Charge/Discharge Condition

Charge 450mA (0.1C) $\times 16$ hrs Discharge 900mA(0.2C) to 3.0V/ Pack

Open circuit voltage	V	≥ 3.75	Within 1 hr after standard charge/	Pack unit
Internal impedance	m Ω	≤ 150	Within 1 hr after standard charge	Pack unit
Discharge (0.2C)	Minute	≥ 300	Standard Charge , 1hr rest before discharge	Allow to 3 cycles
Discharge (0.5C)	Minute	≥ 112	Standard Charge , 1hr rest before discharge	Allow to 3 cycles
Overcharge	N/A	No leakage nor Deformation	0.1C charge for 48 hrs 0.1 C 充 48	
Charge retention	mAh	≥ 2700 (60%)	Standard charge Storage: 28 days at Ambient Temperature or 7 days at 45 $^{\circ}\text{C}$ Standard discharge	
IEC Cycles Life Test IEC	Cycle	≥ 500	IEC 61951-2 (2017) /7.5.1.2	(see note 1)

Short Circuit	N/A	Leakage&deformation may occur, but no explosion is allowed	After standard charge., short circuit the cell at 20+/-5°C until the cell temperature returns to ambient temperature. (The resistance of the inter- connecting circuitry shall not exceed 0.1Ω.)	Ta=20±5°C
Vibration Resistance	N/A	Change of voltage: < 0.02V/cell change of internal < 5mΩ/cell	Charge at 0.1C for 16hrs and then leave for 24hrs check battery before after vibration Amplitude: 1.5mm Vibration:3000CPM (any direction for 60mins)	
Impact Resistance	N/A	Change of voltage: < 0.02V/cell change of internal < 5mΩ/cell	Charge at 0.1C for 16hrs and then leave for 24hrs check battery before/ after drop Height: 100cm Thickness of the wooden board: 30mm Direction is not specified Test for 3 times	
Leakage		No leakage nor deformation	Standard charge stand for 14 days	
Safety		No disrupt or burst, explosion, but leakage of electrolyte and deformation are acceptable	The battery shall undergo a forced discharge in an ambient temperature of 20±5°C, at a constant current of 0.2ItA, to a final voltage of 0V. the current shall then be increased to 1.0ItA and the forced discharge continued in the same ambient temperature of 20±5°C, for 60 min.	Ta=20±5°C

Notes

- 1、 Approximate charge time from discharged rate, for reference only IEC 61951-2 (2017) 7.5.1.2
Cycle Life Test

Cycle No.	Charge	Rest	Discharge
1	0.1C, 16h	None	0.25 C, 2h 20min
2—48	0.25 C, 3h 10min	None	0.25 C, 2h 20min
49	0.25 C, 3h 10min	None	0.25 C to 1.0V/cell
50	0.1 C, 16h	1h-4h	0.2 C to 1.0V/cell

Cycle 1 to 50 shall be repeated until the discharges duration on any 50th cycle becomes less than 3hrs

2、 EXTERNAL APPEARANCE

The cell / battery shall be free from cracks, scars, breakage, rust, discoloration, leakage and deformation.

3、 WARRANTY

One year limited warranty against workmanship and material defects.

4. ELECTRICITY RETAINS

Normal conditions with electricity retain 50%, if have special demands, confirm after negotiate

5、 WARNING

5. 1 Do not reverse charge batteries

5. 2 Do not short circuit batteries, permanent damage to batteries may result

5. 3 Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive.

5. 4 Store batteries in a cool dry place. Always discharge batteries before bulk storage or shipment.

5 5Do not solder directly to cells or batteries.

5. 6 If find any noise, excessive temperature or leakage from a battery, please stop its use.

5. 7 Do not incinerate or mutilates batteries, may burst or release toxic material.

5. 8 Do not mix new batteries in use with semi-used batteries, over-discharge may occur.

5. 9 Do not remove the outer sleeve from a battery pack nor cut into its housing

5. 10 Never put a battery into water or seawater.

6、CAUTION

6. 1 Batteries should be charged prior to use.

6. 2 For charging methods please referred to our technical handbook.

6. 3 Use the correct charger for Ni-MH batteries.

6. 4 Avoid batteries being used in an airtight compartment. Ventilation should be provided inside the battery compartment, otherwise batteries may generate hydrogen gas, which could cause an explosion if exposed to an ignition source.

6. 5 Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact.

6. 6 Keep away from children. If swallowed, contact a physician at once.

6. 7 When using a new battery for the first time or after long term storage, please fully charge the battery before use.

6. 8 When using a new battery in use with semi-used batteries, over-discharge may occur.

6. 9 When the battery is hot, please do not touch it and handle it, until it has cooled down.

6. 10 When find battery power down during use please switch off the device to avoid over discharge

6. 11 Unplug a battery by holding the connector itself and not by pulling at its cord.

6. 12 After use, if the battery is hot. Before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.

7、STORAGE贮存

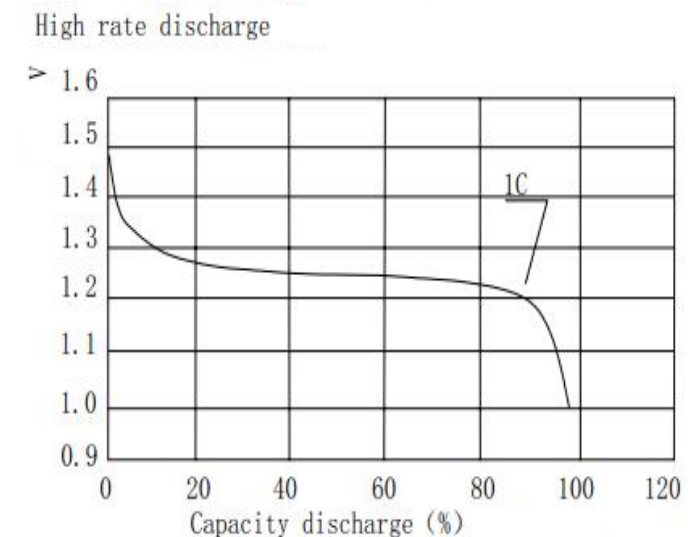
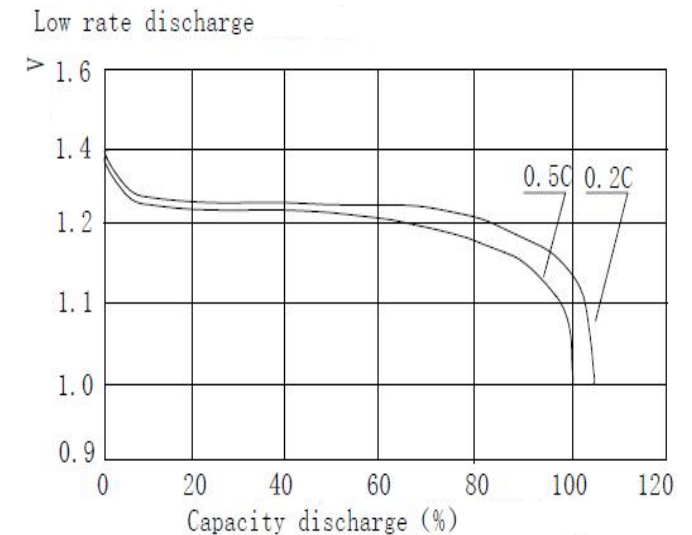
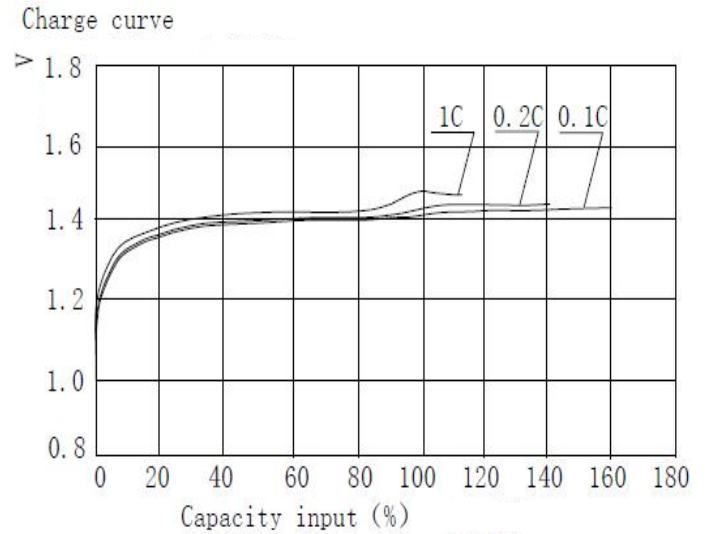
7. 1 In order to ensure the battery to maintain the capacity level, we suggest Ni-MH battery and battery pack should be stored under the condition of the -20 ~ 35 °C, low humidity, no corrosive gases.

- 7.2 Ni-MH battery to avoid the high temperature or high humidity storage, otherwise it would lead to the battery leakage rust and the lower capacity
- 7.3 The long-term storage may lead to NiMH batteries and battery packs to reduce the capacity and need 1-3 charge / discharge cycles to reach the maximum discharge capacity.
- 7.4 Three months after placing the battery need to be charge/discharge for one cycle.

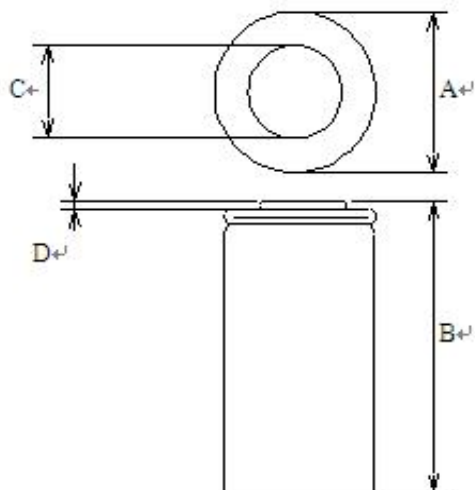
Type Rechargeable Nickel Metal Hydride Cylindrical Cell

Specification of single cell

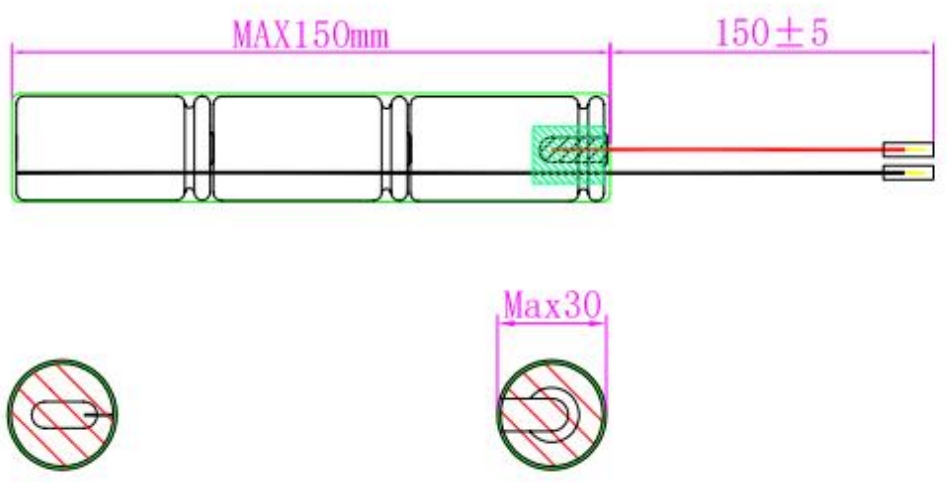
Nominal Voltage		1.2V
Internal Resistance		≤18.0mΩ
Capacity	Nominal	4500mAh
	Minimum	4500mAh
Weight		About 81.0g
Charge	Standard	0.1C
	Fast	0.5C
Temperature Recommended	Standard charge	20±5°C
	Fast charge	10~40°C
	Discharge	-20~60°C
	Storage	-20~35°C
Dimensions with tube	A: Diameter	25.8 (+0/-1.0) mm
	B: Height	49.0 (+0/-1.5) mm
	C: Top diameter	10.0mm
	D: Top height	0.6mm
Continuous Overcharge	0.1C for 48 hrs 0.1C 48	



Drawing



Rev.	Description	Date
A	Release	



10	PVC	44*0.12mm	Pcs	1	367U
9		15*10*0.3mm	Pcs	1	
8		C*1 φ 25	Pcs	2	
7		UL1015AWG18	Pcs	1	
6		UL1015AWG18	Pcs	1	
5		0.1*6*30/0.1*6*15mm	Pcs	1/1	
4		0.1*6*30mm	Pcs	2	
3	PVC	41*0.08mm	Pcs	1	367U
2		φ 23.5* φ 10*0.3mm	Pcs	3	
1		C4500mAh 1.2V	Pcs	3	

UNLESS OTHERWISE SPECIFIED

Dimension	Inspection Requirement	Tolerance per
4/5	Important parameter	±0.10
6/7	Product Tolerance parameter	±0.15
8/9	Process control parameter	±0.20
10/11		±0.30
12/13		±0.30

DRAWING DESCRIPTION

UNIT: mm	SCALE: 1:1	SHEET: 1/1	PROJECTION:	AA
DRAWN BY		CHECKED BY	APPR. BY	
PART NUMBERS				

