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**Specification**

**Model:** 460AA1.5LET

**Type :** Rechargeable Nickel Metal Hydride Cylindrical Cell

**Nominal Dimension :** d= 14+0/-0.5 mm, h=49+0/-0.5mm (with sleeve)

**Nominal Capacity :** 1500mAh (20°C,0.2C discharge to 1.0V/cell)

**Nominal Voltage :** 1.2V

**Internal Resistance :** ≤ 25mW (at 1 kHz, fully charged, 20°C,average)

**Applications :** Recommended discharge current 0.05C to 3.0C

**Standard Charge :** 0.1C for 16hrs at 20°C

**Service Life :** >500 cycles (20°C, IEC Standard)

**Average Weight :** 26g

**Typical Capacity :** (20°C)  
1500mAh (0.2 C to 1.0V)

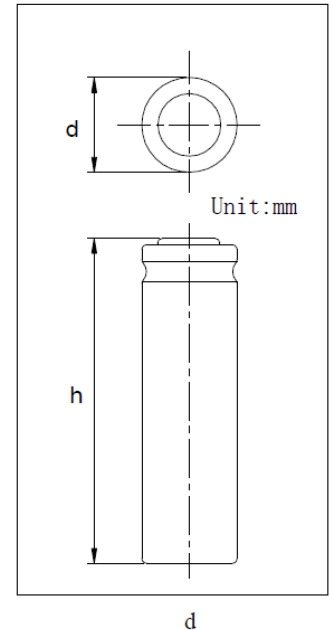
**Max. Discharge Current :** 3.0C (continuous)

**Fast charge :** 0.2C to 0.5C, Charge termination control recommended  
(20°C, -ΔV=5~10mV, Timer =110% nominal input)

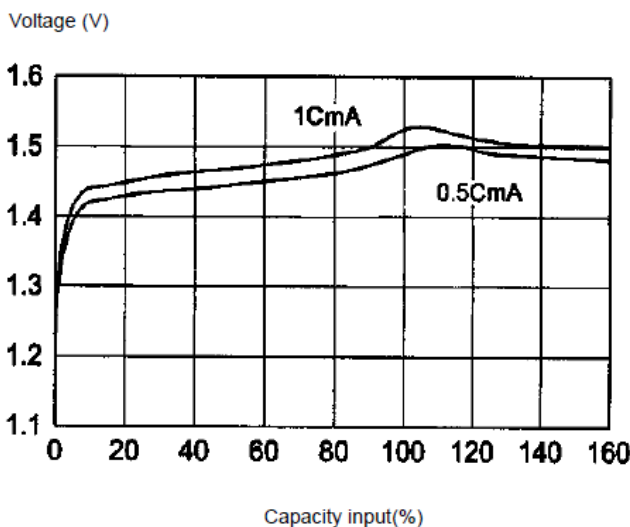
**Continuous overcharge :** 0.1C(less than 100hrs)

**Trickle Charge:** 45mA to 75mA

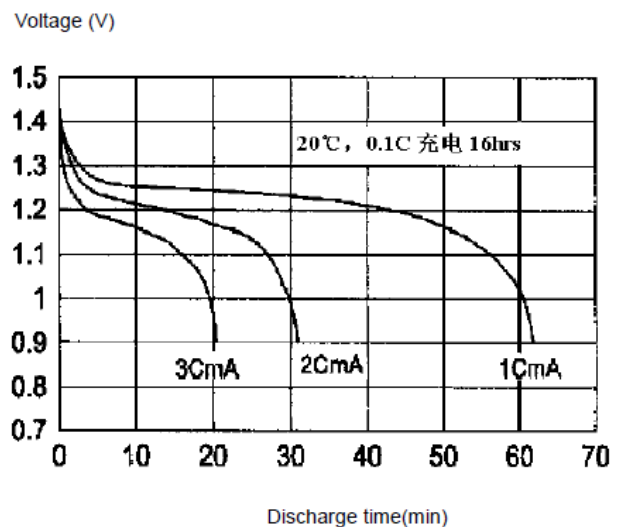
**Operation temperatures** -20°C to +70°C (standard charge)  
(for recommended) -20°C to +45°C (fast charge)  
-20°C to +70°C (discharge)  
-20°C to +70°C (storage )



**Fast Charge Curve**



**High Rate Discharge**



**Performance and Quality Assurance**

**1. Scope**

This Spec. governs the performance of Nickel Metal Hydride Cylindrical cell. The nominal voltage of this type unit cell is 1.2V.

For example: 460AA1.5LET

Nominal voltage of unit cell: 1.2V

Voltage of the batteries: 1.2V, Capacity of the battery : 1500mAh

**2. Ratings**

The following is the basic item to rating a cell. May test the cell under demand.

Description	Unit	Specification	Conditions
Nominal Voltage	V/cell	1.2	Per cell
Nominal Capacity	mAh	1500	Standard charge and discharge
Standard Charge	mA	150(0.1C)	Ambient temperature 0~45°C
	hrs	16	
Fast Charge	mA	750(0.5C)	-ΔV=5~10mV, ambient temperature 0~45°C Timer =110% nominal input TCO: 45~50°C -dT/dt=0.8~1.0°C/min
	hrs	2.4	
Internal Resistance	mΩ/cell	≤ 25	at 1 kHz, fully charged, 20°C
Cut-off Voltage	V/cell	1.0	Discharge current ≤1.0C
Max. Discharge Current	mA	4500(3C)	Ambient temperature -20~60°C
Storage Temperature	°C	-20 ~70	Charges 80% nominal input
Average weight	g/cell	26	

**3. Performance**

Except for special notice, the test should be carried out with a month after delivery under the following conditions:

The ambient temperature is: 20±5°C

The ambient humidity is: 65±20%

The testing instrument must meet the following:

Voltmeter : IEC 485 prescribed 0.5 grade or more, resistance must be more than 10KΩ/V

Galvanometer : IEC 51/IEC 485 prescribed 0.5 grade or more, total resistance must be less than 0.01Ω

Ri ohmmeter: AC sine 1KHz, 4 terminal

Test	Unit	Specification	Conditions	Remarks
OCV	V/cell	≥ 1.25	With in 1hrs after standard charge	

Capacity	mAh	≥ 90%	Standard charge and discharge	Allow 3 cycles
Internal Impedance	mΩ/cell	≤ 25	Fully charged, Ambient temperature 20°C	
High Rate Discharge	min	≥ 108	Standard charge, rest 1hrs 0.5C discharge to 1.0V/cell	Allow 3 cycles
Discharge at Low Temperature	mAh	≥60% Nominal Capacity	Standard charge at 20°C 0.5C discharge to 1.0V/cell at 0°C	
Charge at High Temperature	mAh	≥80% Nominal Capacity	1.0C charge at 55°C, -ΔV=10mV /cell, Standard discharge at 20°C	
Self-discharge	mAh	≥60% Nominal Capacity	Standard charge, storage 28 day at 20°C, Standard discharge	
Humidity		Deformation	1C fully charged, 33±3°C , 80±5%R.H., storage 14 day	
The Resistance to Vibration		The change of voltage: ≤0.02V/cell The change of Ri: ≤5 mΩ/cell	Charge: 16hrs at 0.1C Rest: 24hrs Inspect the cell before and after vibration Vibration conditions: Amplitude: 1.5mm Frequency: 3000CPM at random orientation for 60 min	
The Resistance to Shock		The change of voltage: ≤0.02V/cell The change of Ri: ≤5 mΩ/cell	Charge: 16hrs at 0.1C Rest: 24hrs Inspect the cell before and after shock Shock condition: Drop 3 times onto solid wood (10mm thickness) from 1.5m height at random orientation.	
Over Charge		No rupture	1C for 5hrs	
Over Discharge		No rupture	Standard charge Short circuit: 1h Conductor: 0.75mm <sup>2</sup> ×20mm (Cu line)	
IEC Cycles Life	cycle	≥500	IEC61951-2 (2001) 4.4.1	See note 1
Accelerated Cycles Life	cycle	≥300	0.5C charged, rest 30min, 0.5C discharge to 1.0V/cell,	Cycling charge /cutoff condition:

			capacity ≥60% Nominal Capacity	-ΔV=10mV/cell voltage cutoff =110% of input capacity
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**4. Appearance**

Cell should be without any cracking, rupture, dirt, shading, leakage and deformation.

**5. Standard of quality assurance (AQL)**

All tests should be done according the following methods (ref.MIL-STD-105E)

Number	Item of test	Sampling criteria	Standard of quality assurance
1.	Cosmetic	I grade	1.5
2.	Dimension	I grade	0.65
3.	Performance	I grade	0.4

Including: capacity, performance of charge and discharge at 1C, open current voltage, Internal Resistance

**6. Warranty**

One year's guarantee is valid for the defects caused by processing and materials.

**7. Caution**

- 7.1 Do not dispose of cell into a fire or dismantled under any condition
- 7.2 Do not mix different cell types and capacities in the same battery assembly
- 7.3 Charge and discharge under specified current recommend to the specification
- 7.4 Short circuit leading to cell venting must be avoided
- 7.5 Never solder onto cell directly
- 7.6 Cell reversal should be avoided
- 7.7 Use batteries in extreme condition may affect the service life, such as: extreme temperature , deep cycle, extreme overcharge and over discharge
- 7.8 Batteries should be stored in a cool, dry place, Please discharge before mass storage or transportation
- 7.9 Once problems be found , stop using, send batteries to local agent
- 7.10 Because the limit of the electrochemical system, charged the cell of 80%~100% nominal input under long storage is recommended
- 7.11 To maintain the performance of the cell stored for about 6 months, cycling(charging and discharging) the cell for several times is recommended