EL.CO. ELETTRONICA Srl
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R.E.A. Treviso N° 96432
Capitale Sociale Euro 118.000 i.v.
Iscrizione al Registro Nazionale Pile e Accumulatori nr.: IT13100P00003326
In fase d'implementazione SGQ UNI EN ISO 9001:2008

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Specification

Model: 460AAA1.3SET

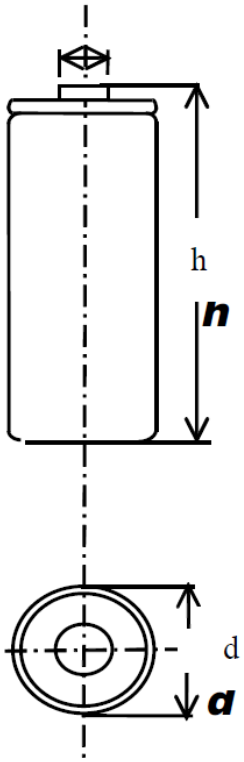
Type : Rechargeable Nickel Metal Hydride Cylindrical Cell

Nominal Dimension : d= 10.4+0-0.7mm, h=43.5+0-1.5mm(with sleeve)

Nominal Capacity : 1300mAh (20℃,0.2C discharge to 1.0V/cell)

Nominal Voltage : 1.2V

Internal Resistance : ≤ 40mΩ (at 1 kHz, fully charged, 20℃,average)



Applications : Recommended discharge current 0.05C to 3.0C

Standard Charge : 0.1C for 16hrs at 20℃

Service Life : >500 cycles (20℃ , IEC Standard)

Average Weight : 13.8g

Typical Capacity : (20℃)
1300mAh (0.2 C to 1.0V)
1250mAh (0.5C to 0.95V)

Max. Discharge Current : 3.0C (continuous)

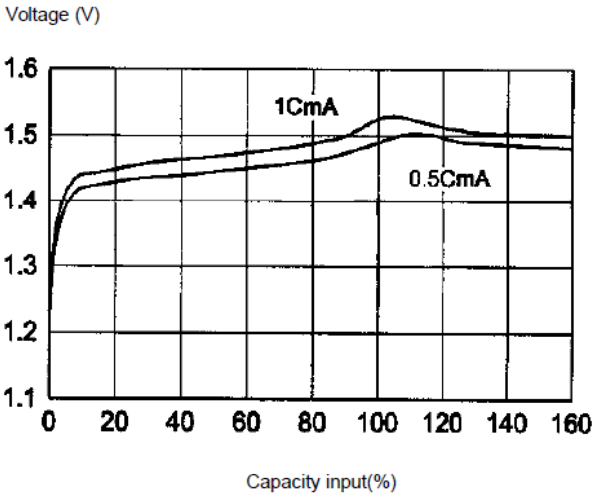
Fast charge : 0.2C to 0.5C, Charge termination control recommended (20℃ , -ΔV=5 ~ 10mV , Timer =110% nominal input)

Continuous overcharge : 0.1C(less than 100hrs)

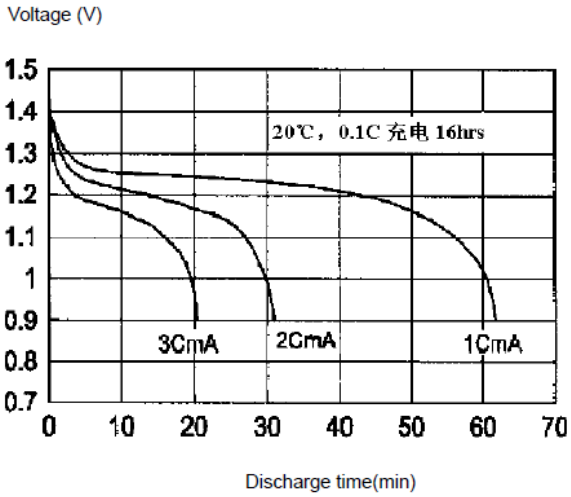
Permanent charge : 130mA to 150mA

Operation temperatures : 0℃ to +45℃ (standard charge)
(for recommended) +10℃ to +45℃ (fast charge)
-20℃ to +60℃ (discharge)
-20℃ to +35℃ (storage)

Fast Charge Curve



High Rate Discharge



Performance and Quality Assurance

1. Scope

This Spe. Governs the performance of Nickel Metal Hydride Cylindrical cell and its stacked-up batteries. The nominal voltage of this type unit cell is 1.2V, and the voltage of the stacked-up batteries shall be equal to the value of the unit cell multiplied by the number of cells in the batteries, and the capacity shall be the capacity of the unit cell:

For example: 460AAA1.3SET, Batteries of 1 cell

Nominal voltage of unit cell: 1.2V

Voltage of the batteries: 1.2*1=1.2V, Capacity of the battery：1300mAh

2. Ratings

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

Description	Uit	Specification	Conditions
Nominal Voltage	V/cell	1.2	Unit cell
Nominal Capacity	mAh	1300	Standard charge and discharge
Standard Charge	mA	130(0.1C)	Ambient temperature 0~45℃
	hrs	16	
Fast Charge	mA	650(0.5C)	-ΔV=5～10mV，ambient temperature 0~45℃ Timer =110% nominal input TCO: 45~50℃ -dT/dt=0.8~1.0℃/min
	hrs	2.4	
Internal Resistance	mΩ/cell	≤ 40	at 1 kHz, fully charged, 20°C
Cut-off Voltage	V/cell	1.0	Discharge current <=1.0C
Max. Discharge Current	mA	3C	Ambient temperature –20 ~60℃
Storage Temperature	°C	-20 ~35	Charges 80% nominal input
Average weight	g/cell	13.8	

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℃

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 lessthan 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	≤ 40	Fully charged, Ambient temperature 20℃	
High Rate Discharge	min	≥ 108	Standard charge, rest 1hrs 0.5Cdischarge to 1.0V/cell	Allow 3 cycles
Discharge at Low Temperature	mAh	≥60% Nominal Capacity	Standard charge at 20℃ 0.5C discharge to 1.0V/cell at 0℃	
Charge at High Temperature	mAh	≥80% Nominal Capacity	1.0C charge at 40℃, -ΔV=10mV /cell, Standard discharge at 20℃	
Self-discharge	mAh	≥60% Nominal Capacity	Standard charge, storage 28 day at 20℃, Standard discharge	
Humidity		Deformation	1Cfully charged, 33±3℃ , 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^2×20mm (Cu line)	
IEC Cycles	cycle	≥500	IEC61951-2（2001）4.4.1	See note 1

Life				
Accelerated Cycles Life	cycle	≥300	0.5C charged, rest 30min, 0.5C discharge to 1.0V/cell, capacity ≥60% Nominal Capacity	Cycling charge /cutoff condition: -ΔV=10mV/cell ortimer cutoff =110% of input capacity

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

Note：IEC61951-2（2001）4.4 .1 Cycle Life Test:

Cycle No.	Charge	Rest	Discharge
1	0.1C×16hrs	0	0.25C×2hrs 20min
2~48	0.25C×3hrs 10min	0	0.25C×2hrs 20min
49	0.25C×3hrs 10min	0	0.25C to 1.0V/cell
50	0.1C×16hrs	1~4hrs	0.20C to 1.0V/cell
Repeat 1 to 50 cycles, until the discharge time of a 50th cycle is less than 3hrs			