Performance Specification

Zinc Chloride Battery

Type：H4R25X

Signature：

Date：

东莞高力电池有限公司

Signature：

Date： 2015.1.1

Performance Specification

Type： H4R25X Zinc Chloride Battery

Issue Date： Jan.2015 Revision：04

1、 Scope

The purpose of this document is to specify the quality requirements for Hi-Watt battery produced with H4R25X zinc chloride battery.

2、 Referenced Documents

2.1 IEC publication 60086-1 Primary batteries --- Part 1 General.

2.2 IEC publication 60086-2 Primary batteries --- Part 2 Specification sheets.

2.3 ISO publication 2859-1:1999 / GB/T 2828.1-2012 Sampling plan and procedure for inspection by attribute; Method of sampling=General inspection levels Ⅱ.

3、 Battery Type and Ratings

3.1 Battery Type：

Type	IEC	ANSI	JIS	NEDA
H4R25X	4R25	908		908

3.2 Nominal Voltage：6.0V

3.3 Average Weight： 560g

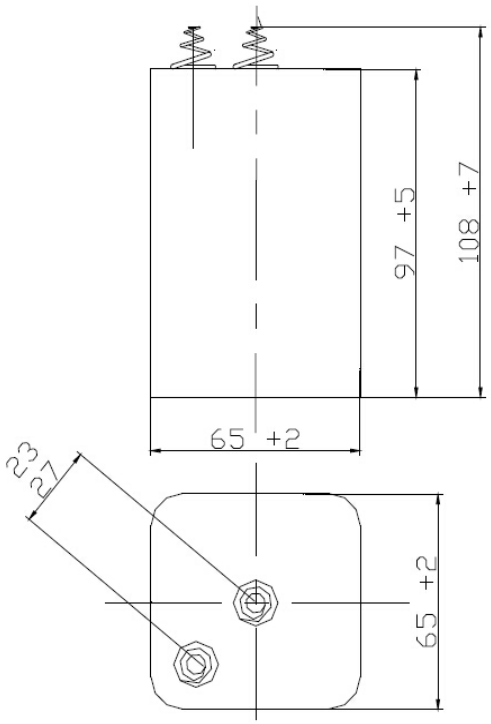
3.4 Operating Temperature： -20~50℃

3.5 Rated Capacity：7500mAh（110Ω 12h/day 3.6V）

4、 Physical Characteristics

4.1 Dimensions

Dimensional requirements are drawn from IEC publication 60086-2, unless otherwise indicated on the relevant supplement.



4.2 Appearance

The products shall be free from dents, scratches, corrosion, contamination, or disfigurations, which affect service and saleability.

4.3 Date Code

Identify expiry date of the battery using Hi-Watt date coding 6 digits mark in the location of the bottom of cell, the first two digits indicate month, others indicate year. Expiry date code for 3 years is used (e.g a battery manufactured on Jan.2015 will carry an expiry code of 012018).

5、 Electrical Characteristics

5.1 Environmental Conditions

All electrical tests shall be conducted (in the sequence shown hereunder) at a temperature of 20 ± 2℃ with a relative humidity between 45% to75%, after stabilization under these condition for minimum period of 24 hours.

5.2 No-load Voltage

The no-load voltage, measured under the conditions prescribe in 5.1. Voltage shall be carried out using a voltmeter with minimum input impedance of one megohm. The voltage shall be within the values specified.

Initial	12 months after manufactured
6.10~6.60 V	6.00~6.50 V

5.3 On-load Voltage

5.3.1 On-load voltage measurement shall be conducted under the conditions prescribed in 5.1. Voltage measurement shall be carried out within 2±0.2 second of applying load.

5.3.2 The load resistor including all parts of the external circuit shall be within 0.5% of the value stated.

Initial	12 months after manufactured
Above 5.50 V	Above 5.40 V

Load resistance：9.1Ω±0.5%

5.4 Jacket Insulation

No voltage reading is permitted between the jacket and either positive or negative terminal.

6、 Service output

6.1 To determine the service output, batteries shall be discharged through a fixed resistive load under conditions prescribed in 5.1 until the on-load voltage falls to the prescribed value (endpoint voltage).

6.2 Sample sizes for discharge test shall be in accordance with IEC Publication 60086-1 requirements.

6.3 Discharge loads, minimum average service lives, and endpoint shall be in accordance with those specified on relevant supplement.

6.4 Service Performance

Discharge Conditions	Applications	EPV	Unit	MAD(Initial)		
				Minimum	Nominal	IEC
8.2Ω 30min/day	Portable lighting 1	3.6V	min	420	500	350
9.1Ω 30min/h,8h/day	Portable lighting 2	3.6V	min	450	520	270
110Ω 12h/day	Road warning lamp	3.6V	h	170	180	155

Note: Delayed discharge performance after 12 months is 80% of MAD(Minimum Average Discharge Performance)

7、 Leakage

7.1 The delivered batteries stored under normal non-air conditioned environments shall not have electrolyte leakage during the guaranteed period.

7.2 When the batteries are discharged under the conditions of specified load, until the on-load voltage falls to 0.6 V per single cell, no leakage or deformation shall occur, in accordance with IEC Publication 60086-1 requirements.

7.3 For further leakage acceptance tests are to be agreed between Hi-Watt and purchaser.

8、 Marking

Artwork for the batteries and packing shall conform to agree standard. This shall include as a minimum.

A Designation;

B The sign " + " shall be mark on or adjacent to positive terminal;

C Nominal voltage;

D Appropriate cautionary advice.

9、 Acceptance Criteria

9.1 Class 1,2,3 and 4

Defect classification	Critical	Major functional	Major	Minor
Class 1				
Live Jacket（CL.4.2）	×			
Polarity marking（CL.8）	×			
Class 2				
No-load voltage（CL.5.2）		×		
On-load voltage（CL.5.3.2）		×		
Leakage（CL.7.1）		×		
Class 3				
Dimension（CL.4.1）			×	
Major appearance defect(CL.10.3)			×	
Class 4				
Minor appearance defect (Cl.10.4)				×

9.2 Class5

Defect classification	Sample size	Permitted failures
Service output	9	*
Leakage(CL.7.2)	9	0

* Average service life shall be greater than or equal to the specified value. If this average is less than the specified value, a repeat test shall be made and a new average is calculated. If this average is still less than the specified value, the lot does not conform, and no further testing is permitted.

10、Defect Classification

10.1 Critical defect (AQL 0.15%)

A defect that analysis, judgment and experience indicates is likely result in hazardous or unsafe conditions for the user.

10.2 Major functional defect (AQL 0.25%)

A defect, other than a critical defect, that is likely to result in a failure, or to reduce materially the ability to use the cell/battery for its intended purpose.

10.3 Major appearance defect (AQL 0.65%)

A defect that is not likely to reduce materially the ability to use the cell/battery for it's intended purpose, or that is a departure from specification having little bearing on the effective performance of the cell/battery, but may reduce saleability of the cells/batteries.

10.4 Minor appearance defect (AQL2.5%)

Minor surface blemishes or scratches that are unlikely to reduce saleability of the cells/batteries.

11、Environmental Requirements

No mercury or cadmium may be added to the product or used during the manufacturing process.
The heavy metal limits as following:

Mercury ≦ 1ppm/battery
Cadmium ≦ 5ppm/battery
Lead ≦ 400ppm/battery

12、Packing

The packing must be adequate to avoid mechanical damage during transport, handling and stacking. The material and pack design must be chosen so as to prevent the development of unintentional conduction, corrosion of terminals and ingress of moisture.