Zhejiang *Yonggao* BATTERY Co., Ltd.

TYPE：R14P-PVC

RODUCT SPECIFICATION

FOR

ZINC MANGANESE DIOXIDE BATTERY

PREPARED BY：

APPROVED BY：

SPEC.NO：R14P-E4030PS

Revision: YG13A Date : 2013.07.30

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1 Scope

This specification is applicable to ***Yonggao's*** R14P-E4030PS super heavy duty.

2 Type designation

IEC/GB	JIS	ANSI	OTHER
R14P	SUM-2	14D	C

3 Reference Document

IEC 60086-1:2011 …*Primary Batteries-Part1:General*
IEC 60086-2:2011 …*Primary Batteries-Part2:Physical and Electrical Specification*
IEC 60086-5:2005 …*Primary Batteries-Part5:Safety of batteries with aqueous electrolyte*
GB/T 8897.1-2008 …*Primary Batteries-Part1: General*
GB/T 8897.2-2008 …*Primary Batteries-Part2:Physical and Electrical Specification*
GB/T 8897.5-2006 …*Primary Batteries-Part5:Safety of batteries with aqueous electrolyte*

4 Chemical System

(-) Zn | $ZnCl_2$-NH_4Cl-H_2O | MnO_2 (+)

Mercury is not added in the battery or mercury and cadmium are not added in the battery.

5 Nominal Voltage：1.5V

6 Weight：Approximate：41g

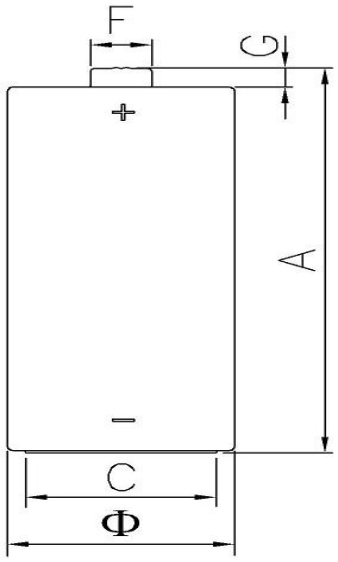
7 Nominal Capacity:

Approximate **2050** mAh (20±2℃,20Ω-4h/d, e.v.=0.9V)

8 Jacket: PVC Lable

9 Dimension (mm)

/	MAX		MIN	
	YG	IEC	YG	IEC
Φ	25.5	26.2	24.9	24.9
A	50.0	50.0	48.8	48.6
C	/	/	16.5	13.0
F	6.6	7.5	/	/
G	/	/	2.0	1.5



10 Appearance

Shall not be observed any major scratches, stains, deformation, crack, corrosion, leakage that may adversely affect actual use of performance of batteries.

11 Electrical Characteristics

- Unless otherwise stated, all measurements are to be performed at a Standard Environment of 20±2℃, 60±15%R.H.
- All samples are normalized for 8 hours at least at 20±2℃, 60±15%R.H environment prior to measurement.
- The digital voltmeter (DCM) is with the precision of 1mV(internal resistance not less than 1MΩ).
- The load resistance of the total circuit is accurate within±5% of the specified value.
- The initial discharge test shall commence within 30 days of manufacture.

11.1 Open circuit voltage(O.C.V) and closed circuit voltage(C.C.V) (Load resistance 3.9Ω, 0.3sec)

/	O.C.V	C.C.V	S.C (reference)	Test Specification
Initial	1.60-1.72V	≥1.43V	≥5.5A	GB/T2828.1/ISO2859-1 General inspection level Ⅰ AQL=0.4
After 1 year	1.55-1.72V	≥1.38V	≥4.0A	

11.2 Service Output

Discharge Condition			IEC60086-2 Standard	Discharge Time			
Load	Test mode	End Voltage		Initial		After 1 year at 20±2℃	
				MAD	Normal	MAD	Normal
20Ω	4h/d	0.9V	28.0h	31.5h	34.5h	35.5h	31.5h
3.9Ω	1h/d	0.8V	4.0h	5.0h	5.5h	4.5h	5.0h
3.9Ω	4m/1h-8h/d	0.9V	270.0m	270.0m	280.0m	250.0m	260.0m
3.9Ω reference	24h/d	0.9V	/	200.0m	220.0m	185.0m	200.0m
Remarks	◆ MAD- Minimum Average Discharge m- minute h- hour d-day ◆ Actual performance for each lot perhaps will be slightly different with normal performance.						

Satisfaction standard:

- ◆ 9 pieces of battery will be tested for each discharging standard.
- ◆ The result of the average discharging time from each discharging standard shall be equal to or more than the average minimum time requirement, and no more than one battery has a service output less than 80% of the specified requirement.
- ◆ One re-test is allowed to confirm the previous result.

12 Leakage Resistance

Item	Test Condition	Period	Requirement	Criterion
Over-discharge leakage test	3.9Ω continuous discharge at temp.20±2℃, Relative Humidity:60±15%RH	E.V. ＝0.60V	There shall be no deformation exceeding the IEC specified dimensions, nor leakage recognized by human eye.	N=9 Ac=0 Re=1
High temperature leakage test	At temp. 45±2℃, Relative Humidity: Less than 65% R.H.	90days		N=40 Ac=1 Re=2

13 Safety Characteristics

Item	Test Condition	Period	Requirement	Criterion
Short circuit characteristics	Positive & negative of an undischarged battery shall be connected directly at temp. 20±2℃, Relative Humidity:60±15%R.H.	24hours	There shall be no explosion * of battery.	N=5 Ac=0 Re=1
Incorrect installation	Four undischarged batteries connected in series with one of the batteries reversed.The resistance of the inter-connecting circuitry is within 0.1Ω.	24hours		N=5 Ac=0 Re=1

***** An instantaneous release wherein solid matter from any part of the battery is propelled to a distance greater than 25 cm away from the battery.

14 Raw & Regulation Compliances

- ◆ This product complies with EU's battery directive 2006/66/EC.
- ◆ Packaging materials comply with EU's directive on packaging materials and waste 94/62/EC.

15 Caution for Use

15.1 Since the battery is not manufactured for recharging, there are risks of electrolyte leakage or causing damage to the device if the battery is charged.

15.2 The battery shall be installed with its "＋"and "－" in correct position, otherwise may cause short-circuit.

15.3 Short-circuiting, heating, disposing of into fire and disassembling the battery are prohibited.

15.4 Battery cannot be forced discharge, which lead to excess internal gas generation and, may result in bulging, leakage and de-crimping of cap.

15.5 New and used batteries cannot be used at the same time, when replaced batteries recommend to replace all and with the same brand type.

15.6 Exhausted batteries should be removed from compartment to prevent over-discharge, which cause leakage & damage to the device.

15.7 Direct soldering is not allowed, which will damage the battery.

15.8 Battery should be kept out of the reach of children to prevent swallow, in case of accident should contact physician at once.

15.9 The battery should not be dismantled and deformed.

16 Storage

16.1 Storage in cool, dry place before use.

16.2 It is recommended that the storage temperature be lower than 30℃.

16.3 Do not keep batteries at relative humidity of 65% or above for long time.

17 Packaging Requirements

The printing on each battery label is legible and permanent. Label defects, if any, shall conform to mutually agreed upon limit samples.

17.1 Packaging for shipment and sales shall conform to the mutually agreed to packaging specification of the designated customers.

17.2 The total of heavy metal lead, cadmium, mercury, and hexavalent chromium concentration shall not exceed 100ppm in packaging materials and printing inks. Ozone depleting substances (ODS) shall not be used in the manufacturing of any packaging.

18 Expiry Date

2 years after delivery under proper storage condition.

19 Expiry Date Marking:

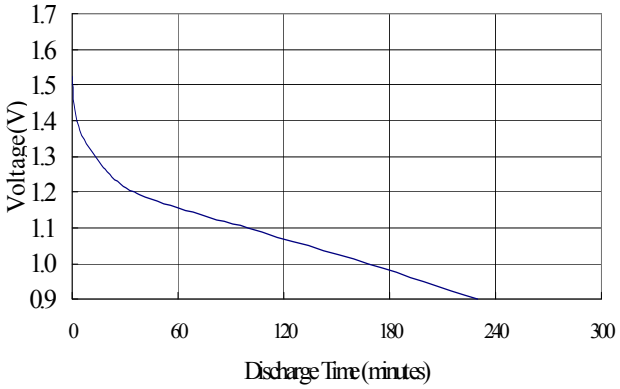
19.1 Unless otherwise specified, each battery will carry a manufacturing date code followed by month and year of manufacturing for domestic and manufacturing date code followed by month and year of expiry for export.(Shelf life 2 years)

19.2 For private label, can mark according to customer's requirements.

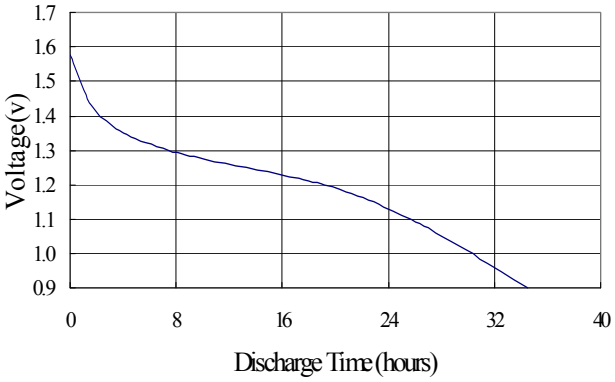
20 Battery Discharge Curves Chart（Page 4）

21 Battery Structure Chart（Page5）

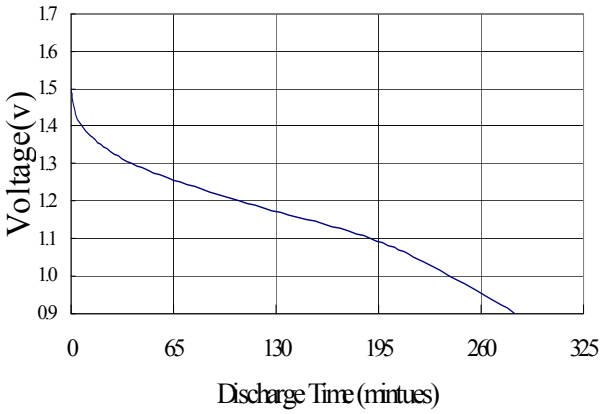
3.9Ω Continuous Discharge Curve



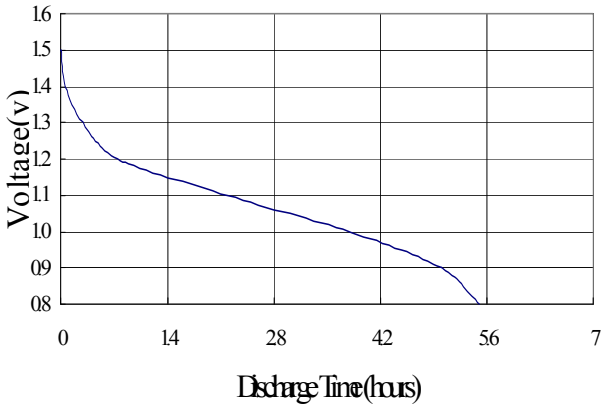
20Ω 4hour/day Discharge Curve

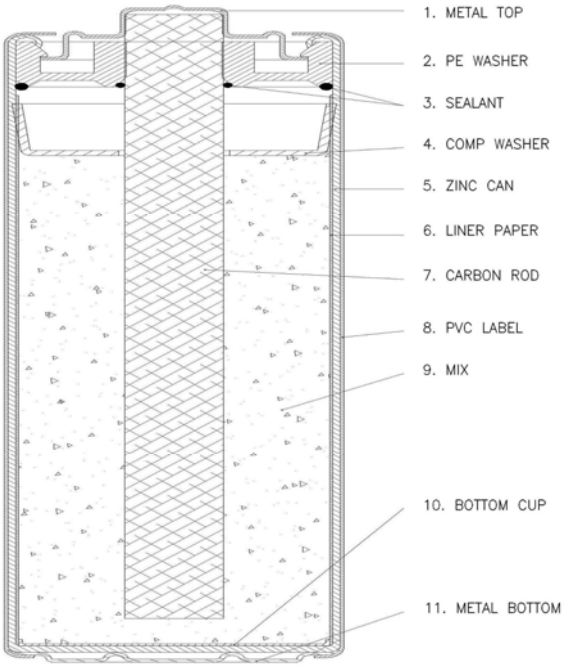


3.9Ω 4m/h-8h/d Discharge Curve



3.9Ω 1hour/day Discharge Curve





R14P(PVC) Battery Structure Chart