



**TECHNICAL SPECIFICATION**  
**FOR**  
**MANGANESE DIOXIDE LITHIUM BATTERY**  
**TYPE: CR1220**

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### 1. Scope

This specification is applicable to the Manganese Dioxide Lithium Battery CR1220 supplied by Guangdong TIANQIU Electronics Technology Co., Ltd.

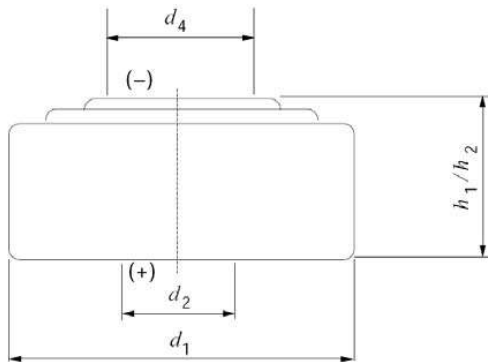
### 2. Designations

TIANQIU: CR1220

IEC: CR1220

Other: ----

### 3. Dimensions



SPEC code	specification standard(mm)	
	MAX	MIN
h1/h2	2.0	1.8
d1	12.5	12.3
d2		-
d4		4.0

Note: h1 battery maximum total height  
 h2 battery positive and negative minimum distance between contacting surfaces  
 d1 Maximum and minimum diameter of the battery  
 d2 minimum diameter of the anode contact area  
 d4 minimum diameter of the cathode surface

### 4. Technical Specification

4.1 Chemical system: Lithium-Manganese Dioxide (Organic electrolyte)

4.2 Average weight: 0.8g

4.3 Nominal voltage: 3.0V

4.4 Nominal capacity: 35mAh/0.115Wh (At the temperature of  $20 \pm 2^\circ\text{C}$ , Continuously loading at 62K $\Omega$  resistance till the voltage down to 2.0V)

4.5 Recommended continuous drain: 0.05mA

Recommended pulse drain: 3mA

4.6 Working temperature range:  $-20^\circ\text{C}$  -  $60^\circ\text{C}$

Storage conditions: Temp.:  $0^\circ\text{C}$  -  $35^\circ\text{C}$  RH: 45% - 75%( no condensate)

## 5. Performance

### 5.1 Test conditions

Unless otherwise specified, the test conditions shall be, as a general rule, at the temperature of  $20 \pm 2^\circ\text{C}$  and the relative humidity of  $60 \pm 15\%$ .

### 5.2 Electrical characteristics

Storage period	Off-load voltage (V)	On-load voltage (V)	Sampling plan
Initial	3.10 - 3.50	3.00 - 3.40	MIL-STD-105E, General Inspection Lever II, Single Sampling, AQL=0.4
12 months @ RT	3.00 - 3.40	3.00 - 3.40	

Remark: On-load voltage:  $62\text{K}\Omega$  / 1 second.

The initial samples shall be tested within 30 days after delivery.

### 5.3 Service output

Discharge conditions			Minimum average duration	
Load resistance	Daily period	End point voltage	Initial	12 months at RT
$62\text{K}\Omega$	24h/d	2.0V	750hrs	700hrs

Remark: The initial samples shall be tested within 30 days after delivery.

### 5.4 Temperature characteristics

Discharge conditions:			Minimum average duration	
Load resistance	Daily period	End point voltage	$0 \pm 2^\circ\text{C}$	$60 \pm 2^\circ\text{C}$
$62\text{K}\Omega$	24h/d	2.0V	608hrs	700hrs

5.3 & 5.4 Acceptance test:

- 1) 9 pieces of battery will be tested for each discharging method.
- 2) The average discharging time from each discharging method shall be equal to or greater than the specified figure, and no more than one battery has a service output less than 80% of the specified figure.
- 3) One retest is allowed to confirm the results if the first test didn't meet the requirements.

### 5.5 Electrolyte leakage resistance

Item	Test method	Requirements	Acceptance standard
Over-discharge	Continuously discharge at $62\text{K}\Omega$ to 1.2V.	No leakage, no deformation	N=9, Ac=0, Re=1
High Temp. storage	Storage the samples at $60^\circ\text{C}$ , RH below 70% for 30 days.	No leakage	N=40, Ac=0, Re=1

## 5.6 Safety characteristics

Item	Test method	Requirements	Acceptance standard
Short circuit test	Short circuit at 55°C. Continued the test at least 1 hour after the cell external case temperature has returned to 55°C.	No explosion, no fire	N=5, Ac=0, Re=1

## 5.7 Shelf life

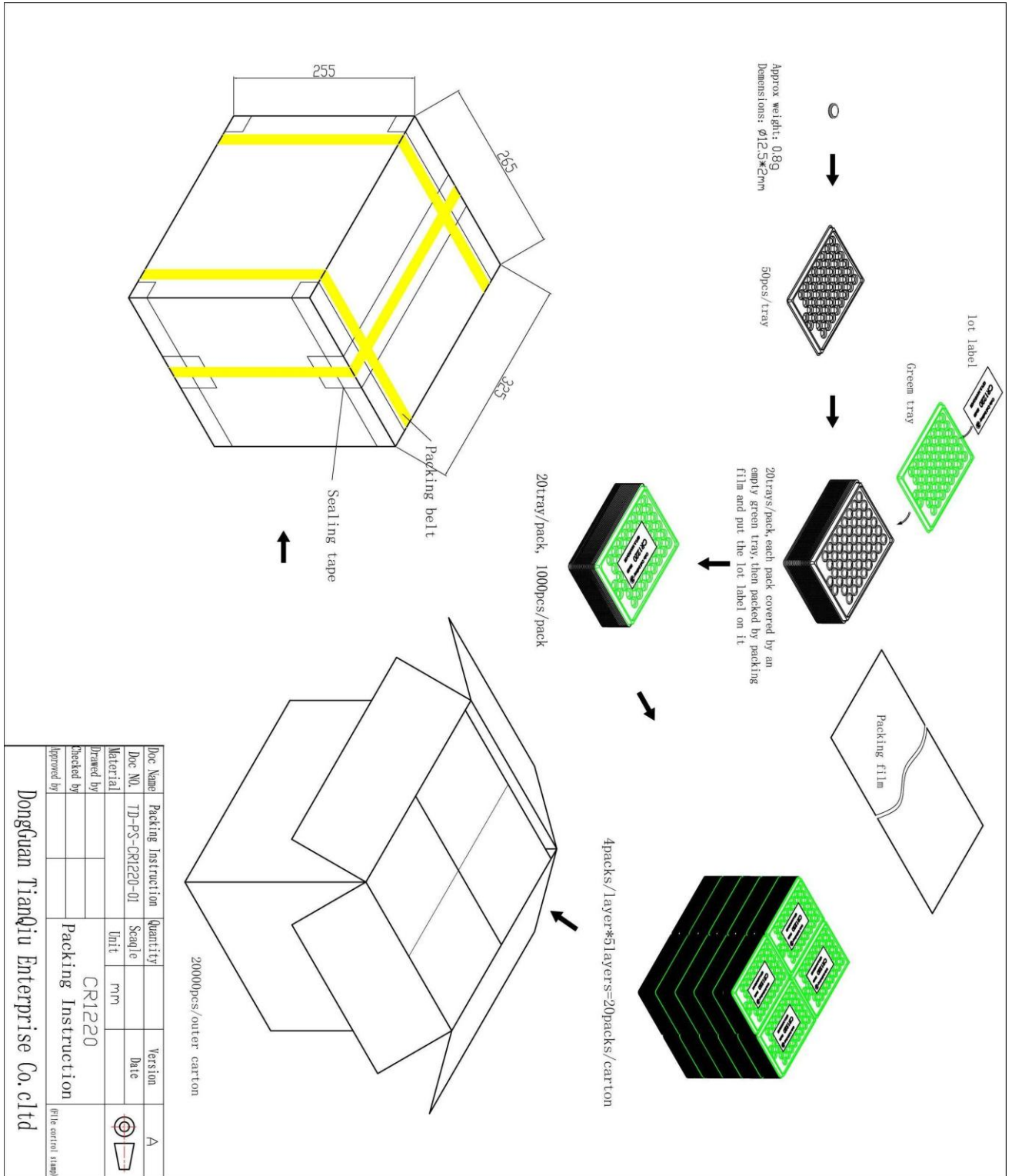
One year after delivery under normal storage conditions.

**6. Packing and Marking**

6.1 Any specific design and packing requirements will be accommodated as required. But as a general, the following markings will be printed, stamped or impressed on the body of the battery:

- 1) Designation: CR1220.
- 2) Polarity Marking: " + "
- 3) Type: Lithium Cell

## 6.2 Packing picture



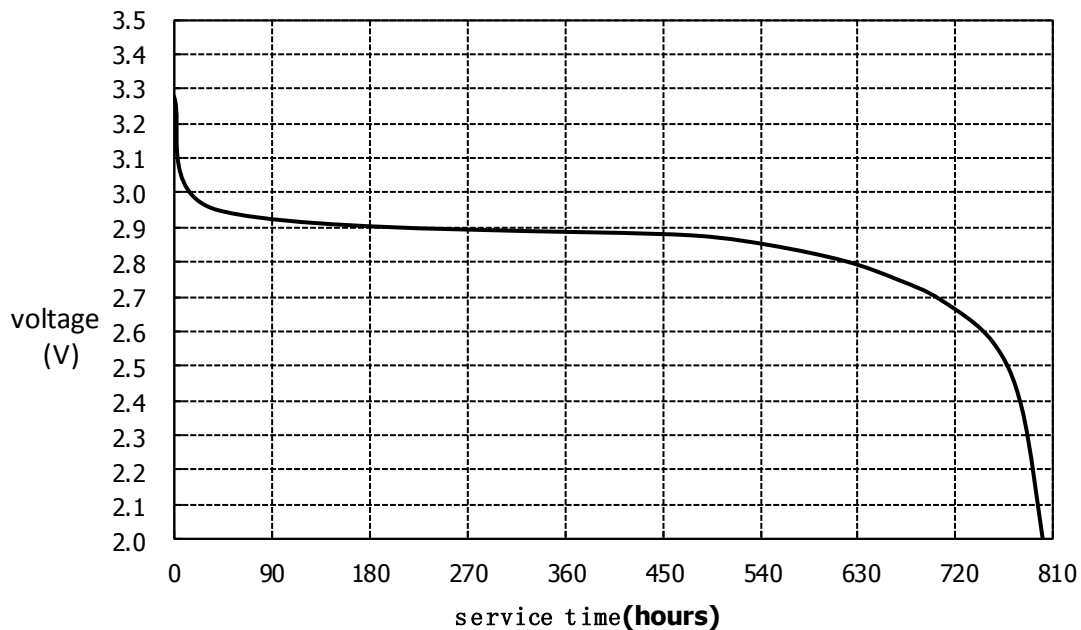
### 7. Caution for Use

- 1) Since the battery is not designed to be charged, there are risks of electrolyte leakage or causing damage to the device if the battery is charged.
- 2) The battery shall be installed with its "+" and "-" polarity in correct position, otherwise may cause the battery to be charged or over-discharged.
- 3) Short-circuiting, heating, disposing of in fire and disassembling the battery are prohibited.
- 4) Battery cannot be forced discharge, which lead to excess internal gas generation and, may result in bulging, leakage and explosion.
- 5) New and used batteries cannot be mix used at the same time, when replaced batteries, it is recommend to replace all and with the same brand type.
- 6) Exhausted batteries should be removed from compartment to prevent over-discharge, which cause leakage and damage to the device.
- 7) Direct soldering is not allowed, which will damage the battery.
- 8) Keep the battery out of the reach of children to prevent swallow, in case of accident should contact physician at once.
- 9) The battery should not be dismantled and deformed.

### 8. Referenced Standards

- IEC 60086-1:2015 –Primary Batteries –Part 1: General
- IEC 60086-2:2015 –Primary Batteries –Part 2: Physical and electrical specifications
- IEC 60086-4:2019 –Primary Batteries –Part 4: Safety of lithium batteries

### 9. Discharge Curve



**Discharge method: 62K $\Omega$ , 24 hours/day EV 2.0V**

**Temperature: 20 $\pm$ 2 $^{\circ}$ C**

