

# SPECIFICATION

REFOND P/N  
RF-A2B31-H40C-H4

R&D

Mass Production



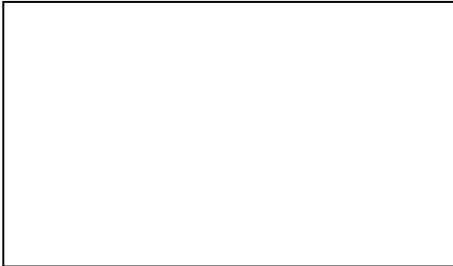
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## 1. Description

### 1.1



The IR source color devices are made with AlGaAs on Substrate Light Emitting Diode

LED AlGaAs

The LED package dimension: 3.5mmX2.8mmX3.5mm.

3.5mmX2.8mmX3.5mm

### 1.2 Features

PLCC4 Package. PLCC4

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process. SMT

Available on tape and reel.

Moisture sensitivity level: Level 3. Level3

Compliance with RoHS and REACH. RoHS REACH

Qualifications: The product qualification test plan is based on the guidelines of AEC-Q102 Stress Test Qualification for Automotive Grade Discrete Semiconductors

AEC-Q102

### 1.3 Application

Automotive Lighting Interior and Exterior.

## 1.4 Package Dimension



### Notes

1. All dimensions units are millimeters.
2. All dimensions tolerances are  $\pm 0.2\text{mm}$  unless otherwise noted.  $\pm 0.2$

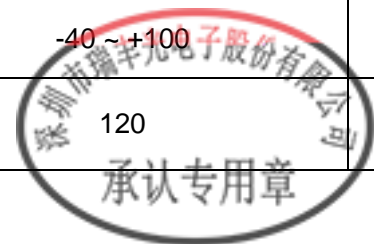
## 1.5 Product Parameters

Table 1-1 Electrical / Optical Characteristics at Ts=25°C

Item	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	$V_F$	$I_F=100\text{mA}$	1.2	1.6	1.8	V
Reverse Current	$I_R$	$V_R=5\text{V}$	---	---	10	$\mu\text{A}$
Radiant Intensity	$I_e$	$I_F=100\text{mA}$	71.5	120	180	mW/sr
Peak wavelength	$\lambda_d$	$I_F=100\text{mA}$	930	940	960	nm
Viewing Angle		$I_F=100\text{mA}$	---	30	---	deg
Thermal Resistance.	$R_{THJ-S}$	$I_F=100\text{mA}$	---	---	130	K/W

Table 1-2 Absolute Maximum Ratings at Ts=25°C

Parameter	Symbol	Rating	Units
Power Dissipation	$P_D$	180	mW
Forward Current	$I_F$	100	mA
Peak Forward Current	$I_{FP}$	700	mA
Reverse Voltage	$V_R$	5	V
Electrostatic Discharge (HBM)	$E_{SD}$	2000	V
Operating Temperature	$T_{OPR}$	-40 ~ +100	
Storage Temperature	$T_{OPR}$	-40 ~ +100	
Junction Temperature	$T_J$	120	



Notes

1. 1/10 Duty cycle, 10ms pulse width.      10ms,      1/10.
2. The above forward voltage measurement allowance tolerance is  $\pm 0.1V$ .       $\pm 0.1V$ .
3. The above color coordinates measurement allowance tolerance is  $\pm 0.005$ .       $\pm 0.005$ .
4. The above luminous intensity measurement allowance tolerance  $\pm 10\%$ .       $\pm 10\%$ .
5. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.
6. All measurements were made under the standardized environment of Refond.
7. When the LEDs are in operation the maximum current should be decided after measuring the package temperature, junction temperature should not exceed the maximum rate. LED
8. ESD yield is over 90% at 2000V ESD (HBM). ESD protection during products handling is needed. 90% LED ESD2000V

**1.6 Bin Range Of Forward Voltage and Luminous Intensity and Dominant wavelength (IF=100mA)      BIN      (IF=100mA)**

Table 1-3

VF V	0		
	1.2-1.8		
Ie mW/sr	Q	R	
	71.5-112.5	112.5-180	
nm	F2	G1	G2
	930-940	940-950	950-960



### 1.7 Typical Optical Characteristics Curves

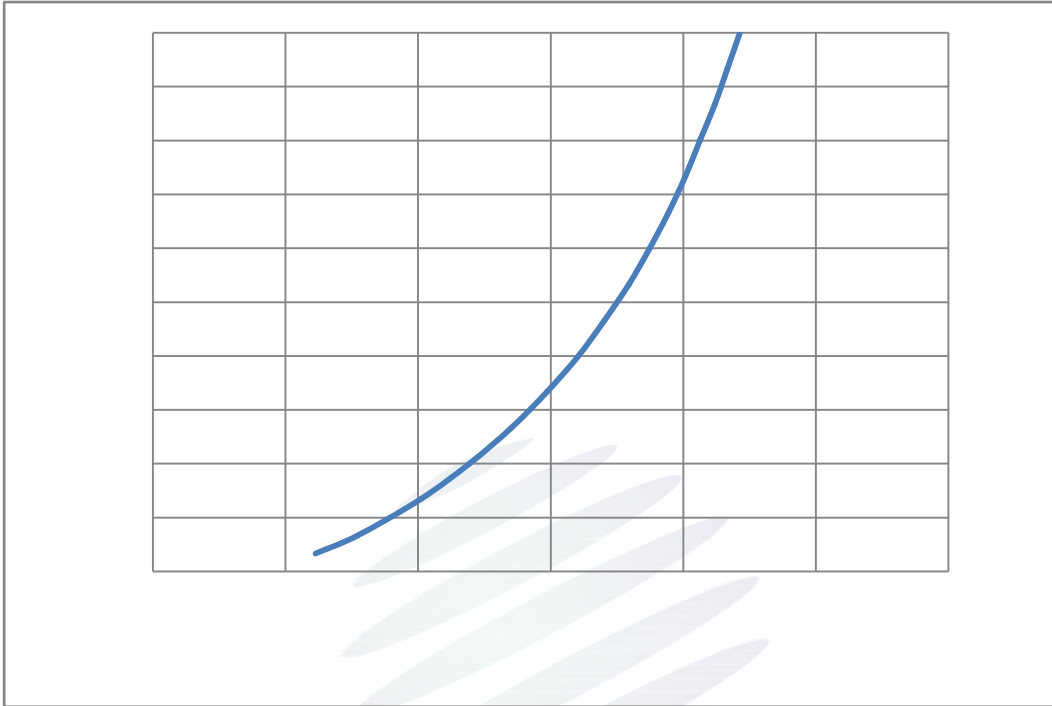


Fig. 1-7 Forward Voltage Vs Forward Current

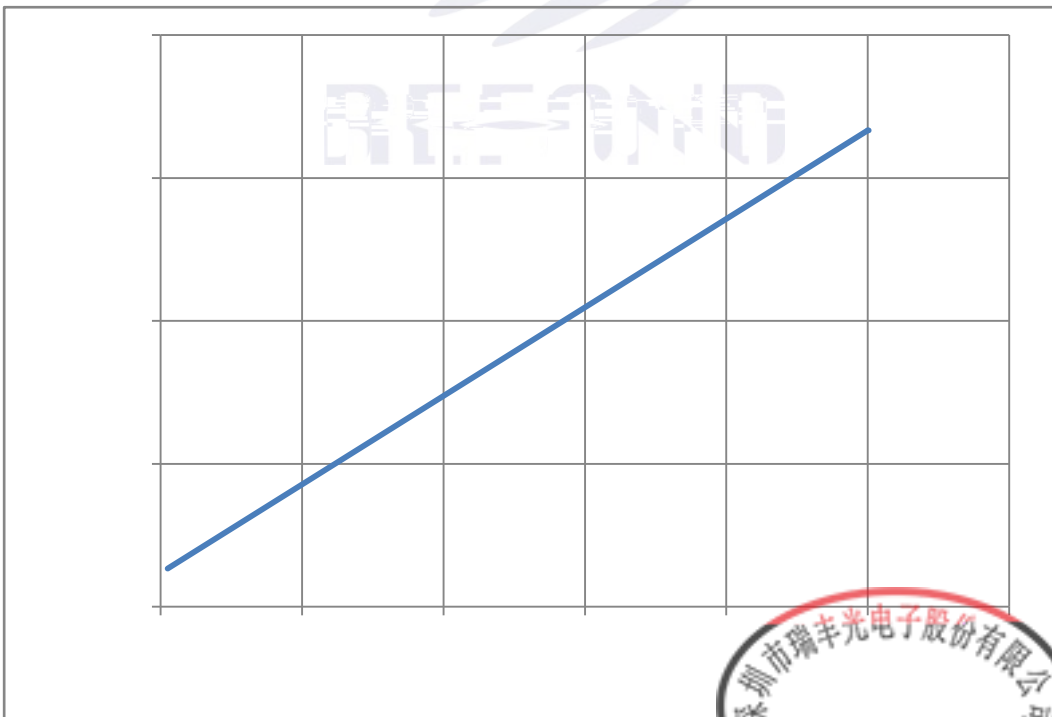


Fig. 1-8 Forward Current Vs Relative Intensity



Fig00793(0) (Solder Temperature vs Relative Humidity) Td(m)7(derd2(m)5 0.001 Tc 0.21 Tw-7(p2(m)5 0.0)4

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Fig. 1-11



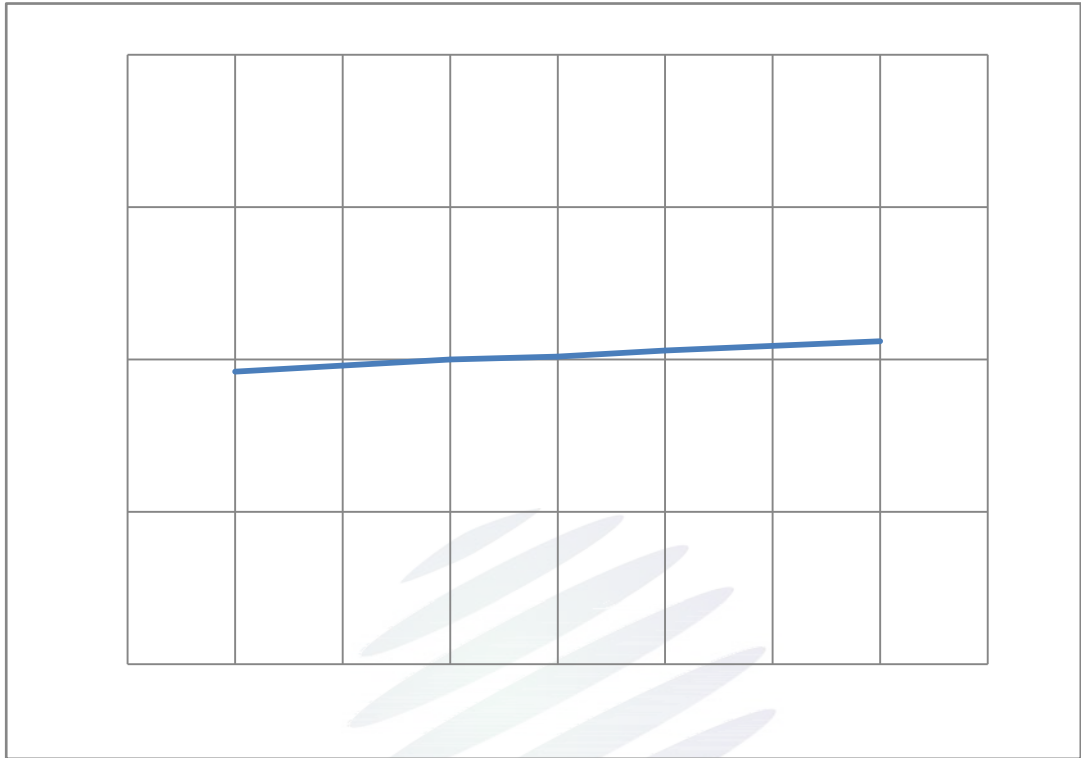


Fig. 1-13

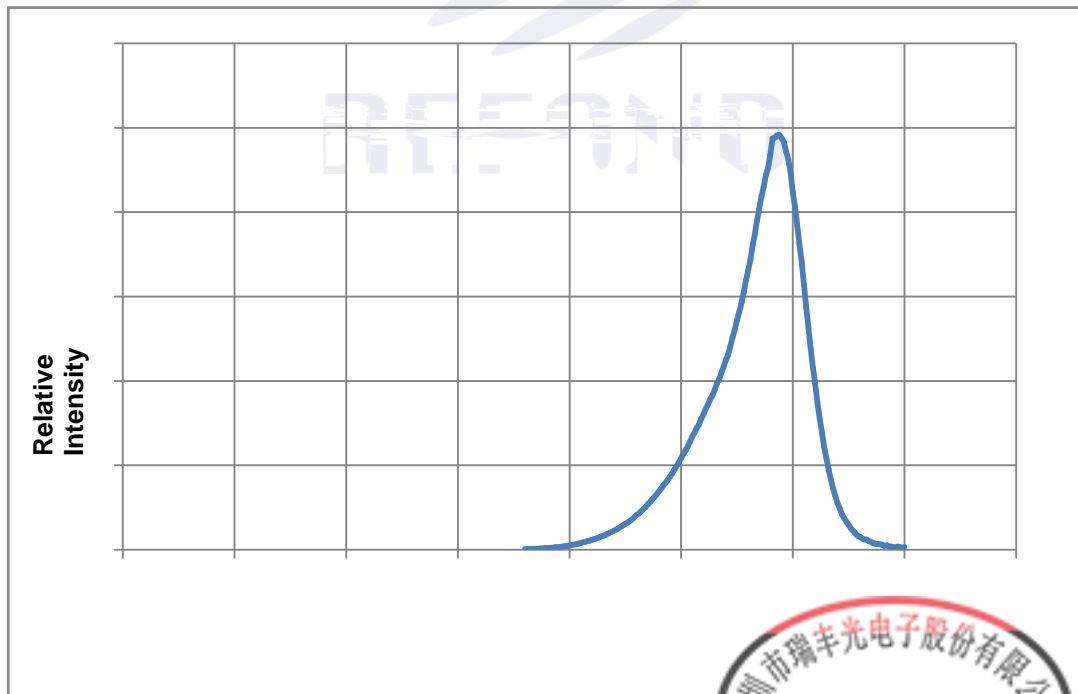


Fig. 1-14 Spectrum Distribution



## 2. Packaging

### 2.1 Packaging Specification

Package: 2000pcs/reel.      2000pcs

#### 2.1.1 Carrier Tape Dimension



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### 2.1.3 Label Form Specification

Table 2-2 Specification

PART NO.	Part Number
SPEC NO.	Spec Number
LOT NO.	Lot Number
BIN CODE	Bin Code
	Luminous flux
XY	Chromaticity Bin
V <sub>F</sub>	Forward Voltage
WLD	Wavelength
QTY	Packing Quantity
DATE	Made Date

Fig. 2-3 Label Form Specification

### 2.2 Moisture Resistant Packing

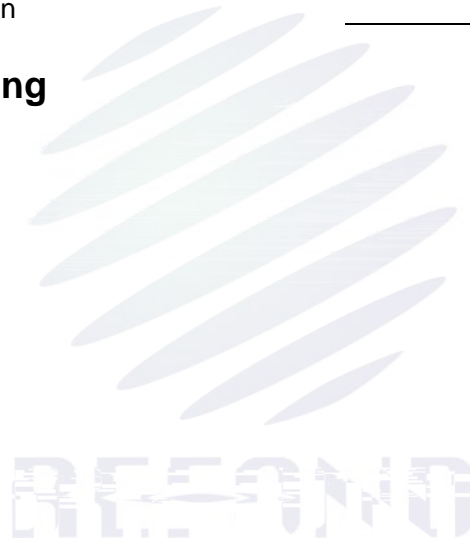


Fig.2-4 Moisture Resistant Packing

### 2.3 Cardboard Box

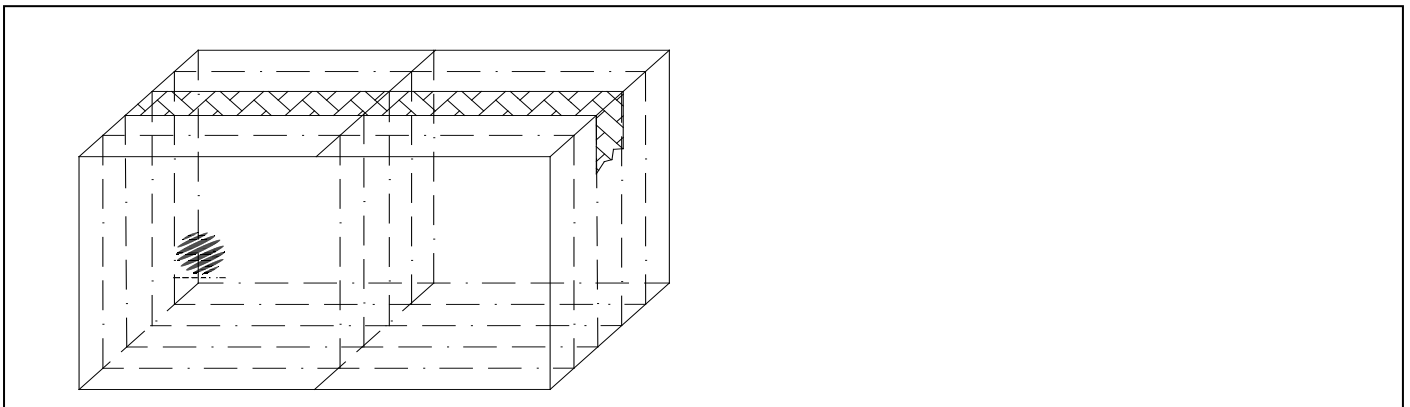


Fig.2-5 Cardboard Box

## 2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re /
Reflow	JESD22-B106	Temp:260 max T=10 sec	2times	20pcs.	0/1
MSL2 2	JESD22-A113	85 / 60%RH	168 hrs.	20pcs.	0/1
Thermal Shock	JEITAED-4701 300307	-40 15min 10s 125 15min	1000 cycle	20pcs.	0/1
Life Test	JESD22-A108	Ta=100 If=100mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH If=100mA	1000hrs.	20pcs.	0/1



## 2.5 Criteria For Judging Damage

Table 2-4 Criteria For Judging Damage

Test Items	Symbol	Test Condition	Criteria For Judgement	
			Min.	Max.
Forward Voltage	$V_F$	$I_F=100\text{mA}$	-	U.S.L*)x1.1
Reverse Current	$I_R$	$V_R = 5\text{V}$	-	U.S.L*)x2.0
Luminous intensity	$I_v$	$I_F=100\text{mA}$	L.S.L*)x0.7	-

### Notes

- 1.U.S.L: Upper standard level                      L.S.L: Lower standard level
2. The above reliability tests is based on the verification of a single/strip LED of Refond's existing experimental platform, the reliability experiment was taken under good heat dissipation conditions. when customers applies the LED to the series and parallel circuit, should take consideration of all the factors such as the current, voltage distribution, heat dissipation and others. / LED  
LED
- 3.The technical information shown in the data sheets is limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license.



## SMT Reflow Soldering Instructions SMT

### 3.1 SMT Reflow Soldering Instructions SMT

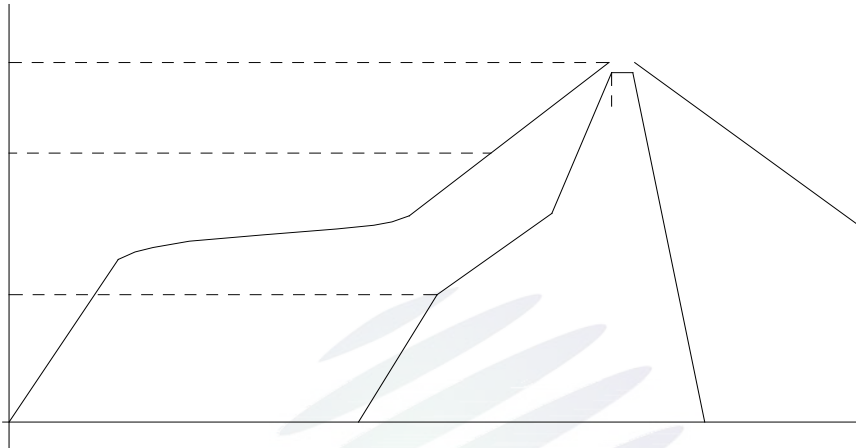


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Reflow parameters

Average temperature rise speed	$T_{smax}$ $T_P$	3 °C/ Max 3 °C/ s
Preheating: minimum temperature	( $T_{smin}$ )	150 °C
Preheating: Max temperature	( $T_{smax}$ )	200 °C
Preheating: Time	$T_{smin}$ $T_{smax}$	60 - 120 60s-120s
Time limited to maintain high temperature: the temperature	( $T_L$ )	217 °C
Time limited to maintain high temperature: The Time	( $t_L$ )	60 Max 60s
Peak /Classification of temperature:	/ ( $T_P$ )	260 °C
Time limit classification of peak temperature time	$t_p$	10 Max 10s
( $T_P$ ) 5 °C Hold time within 5 °C with the actual peak temperature (TP)		30 Max 30s
Cooling speed		6 °C/ Max 6 °C/ s
25 °C Needed time from 25 °C to $T_p$		8 Max 8 minutes

Notes





## 4. Handling Precautions

### 4.1 Handling Precautions

(1) LED operating environment and sulfur element composition cannot be over 100PPM in the LED mating usage material. This is provided for informational purposes only and o( ope)-11 anlloded opeded in( p)-(ur)-7( el)- 723 (



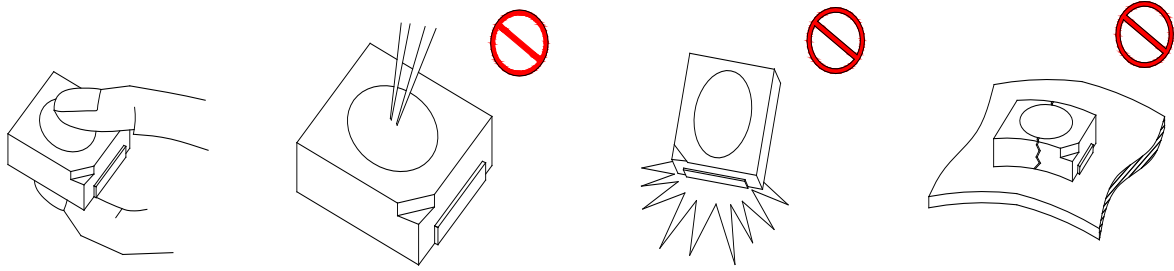


Fig 4-1 Cautions

(5) In designing a circuit, the current through each LED can not exceed the absolute maximum rating specified for each LED. In the mean while, resistors for protection should be applied, otherwise slight voltage shift will cause big current change, burn out may happen. The driving circuit must be designed to allow forward voltage only when it is ON or OFF. If the reverse voltage is applied to LED, migration can be generated resulting in LED damage.

LED

LED

(6) Thermal Design is paramount importance because heat generation may result in the Characteristics decline, such as brightness decreased, Color change and so on. Please consider the heat generation of the LEDs when making the system design.

LED

(7) Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust, requiring special care during processing. In cases where a minimal level of dirt and dust particles cannot be guaranteed, a suitable cleaning solution must be applied to the surface after the soldering of components. Refond suggests using isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that these solvents do not dissolve the package or resin. Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the LED.

LED

Table 4-1 Storage

Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag	30	75%	Within 1 Year From Date
	After Opening Aluminum Bag	30	60%	Recommended for use within 24 hours  24
Baking		60±5	-	24hours  24

(8) If the moisture absorbent material







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Declare

This specification is written both in English and in Chinese and the latter is formal.

