



**APPLICATION FOR LOW VOLTAGE DIRECTIVE**

**On Behalf of**

**Green-Bright Technology Limited**

**LED tube**

**Model No.:** GB-T8-8W-2A, GB-T8-10W-2A, GB-T8-12W-3A, GB-T8-14W-3A,  
GB-T8-15W-4A , GB-T8-18W-4A, GB-T8-20W-4A, GB-T8-22W-4A,  
GB-T8-20W-5A , GB-T8-22W-5A , GB-T8-25W-5A, GB-T8-30W-5A,  
GB-T8-30W-6A, GB-T8-8W-2B, GB-T8-10W-2B, GB-T8-12W-3B,  
GB-T8-14W-3B, GB-T8-15W-4B , GB-T8-18W-4B, GB-T8-20W-4B,  
GB-T8-22W-4B, GB-T8-20W-5B , GB-T8-22W-5B, GB-T8-25W-5B,  
GB-T8-30W-5B, GB-T8-30W-6B

**Prepared for :** Green-Bright Technology Limited

34#, Wangjingkeng Industry Area, Dakan, Xili, Nanshan District,  
Shenzhen, Guangdong, China

**Manufacturer :** Green-Bright Technology Limited

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**Report Number :** GST1101140109

**Date of Test :** Jan. 14, 2010 to Jan. 20, 2010

**Date of Report :** Jan. 21, 2010



<b>TEST REPORT</b>	
<b>IEC 60968</b>	
<b>Self-ballasted lamps for general lighting services Safety requirements</b>	
Report reference No. ....:	GST110114010S
Testing laboratory .....	Global-Standard Testing Service Co., Ltd.
Location.....:	Room 1911-1914, Noble Plaza, Qian Jin 1st Road, Bao An District, Shenzhen, Guangdong, China.
Applicant.....:	Green-Bright Technology Limited
Address:.....:	34#, Wangjingkeng Industry Area, Dakan, Xili, Nanshan District, Shenzhen, Guangdong, China
Manufacturer.....:	Green-Bright Technology Limited
Address:.....:	34#, Wangjingkeng Industry Area, Dakan, Xili, Nanshan District, Shenzhen, Guangdong, China
Standards.....:	IEC 60968:1988 +A1:1991+A2:1999
Procedure deviation.....:	N/A
Non-standard test method.....:	N/A
Type of test equipment .....	LED tube
Trade mark.....:	N/A
Model/Type designation.....:	GB-T8-8W-2A, GB-T8-10W-2A, GB-T8-12W-3A, GB-T8-14W-3A, GB-T8-15W-4A , GB-T8-18W-4A, GB-T8-20W-4A, GB-T8-22W-4A, GB-T8-20W-5A , GB-T8-22W-5A , GB-T8-25W-5A, GB-T8-30W-5A, GB-T8-30W-6A, GB-T8-8W-2B, GB-T8-10W-2B, GB-T8-12W-3B, GB-T8-14W-3B, GB-T8-15W-4B , GB-T8-18W-4B, GB-T8-20W-4B, GB-T8-22W-4B, GB-T8-20W-5B , GB-T8-22W-5B, GB-T8-25W-5B, GB-T8-30W-5B, GB-T8-30W-6B2
Rating.....:	AC90-150V, 50/60Hz ( the model name indicates the wattage, please see page 4)
TRF originator.....:	Global-Standard Testing Service Co., Ltd.
Copyright blank test report:	Global-Standard Testing Service Co., Ltd.
Test item particulars:	--
Operating Condition	Continuous
Class of equipment	Class II equipment
Protection against ingress of water	IP20

**Possible test case verdicts :**

test case does not apply to the test object	N(/A.)
test object does meet the requirement	P(ass)
test object does not meet the requirement	F(ail)

**Name and address of the testing laboratory :**

Global-Standard Testing Service Co., Ltd.  
Room 1911-1914, Noble Plaza, Qian Jin 1st Road, Bao An  
District, Shenzhen, Guangdong, China.

**Tested by :** Steven Zhang Jan. 20, 2011  
Signature Date

Steven Zhang/ Engineer  
Name/title

**Approved by :** Mills Chen Jan. 21, 2011  
Signature Date

Mills Chen/ Manager  
Name/title



<b>General remarks:</b>	
<p>“(see remark #)” refers to a remark appended to the report.</p> <p>“(see appended table)” refers to a table appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p> <p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p> <p>Until otherwise specified, all tests are done under normal ambient condition <math>25^{\circ}\text{C}\pm 10^{\circ}\text{C}</math>, Max RH: 75% and air pressure of 860 mbar to 1060 mbar.</p>	<p>Attached with:</p> <p>Attachment - A. Stylebook Of Marking Label</p> <p>Attachment - B. Photo Documentation</p>
<p>Brief description of the test sample:</p> <p>LED tubes for indoor use only with Model No. GB-T8-XW-YZ. X can be replaced by 8, 10, 14, 15, 18, 20, 22, 25 which indicates the wattage. Y can be replaced by 2, 3, 4, 5, 6. Z can be replaced by letter A or B.</p> <p>Lamp cap was evaluated with reference to IEC 60061: 2006</p> <p>Model was selected as representative sample to perform full tests and the test result was pass.</p> <p>The test result presented in this report relate only to the object(s) tested.</p> <p>The test samples were pre-production sample without serial numbers. This report shall not be reproduced except in full without the written approval of the testing laboratory.</p> <p>The test result presented in this report relate only to the object tested. The samples tested comply with the requirements of this standard.</p>	

IEC 60968			
Clause	Requirement	Result - Remark	Verd.

4.	MARKING		P
4.1	1) Mark of origin	Green-Bright Technology Limited	P
	2) Rated voltage/voltage range (V)	90-150VAC	P
	3) Rated input (W)		P
	4) Rated frequency (Hz)	50/60Hz	P
4.2	1) Lamp current (A)		P
	2) Burning position if restricted		N
	3) The mechanical stress caused by the weight of the lamp in the luminaire		N
	4) Other things which have effect on the operation		N
4.3	1) Presence and legibility of the marking by visual inspection		P
	2) The durability of the marking is checked by rubbing lightly with water and hexane for 15s		P
	3) Availability of information by visual inspection		P
Addition:	Position of the marking		P
	Language of instructions	English	P
	Suitability for use indoors		P
	Wireways smooth and free from sharp edges		P

5.	INTERCHANGEABILITY		P
5.1	Interchangeability shall be ensured by the use of caps in accordance with IEC Publication 61-1		P
5.2	Compliance of the combination of cap and bulb is checked by the use of gauges		N
	B 22d:		N
	A max. and A min. gauge 7006-10/11		N
	D1 max. gauge 7006-10/11		N
	N min. gauge 7006-10/11		N
	Diametrical position of the pins:		N
	Insertion in lampholder gauge 7006-4A		N
	Retention in lampholder gauge 7006-4B		N
	E 27:		N
	Max. dimension of the screw thread gauge		N

	Min. major diameter of the screw thread gauge 7006-28A		N
	Contact making gauge 7006-50		N
	E14:		N
5.3	Mass not exceeding 1 kg		P
	Bending moment not exceeding 2 Nm		P

6.	PROTECTION AGAINST ELECTRIC SHOCK		P
	Lamps shall be so constructed that no internal metal parts or live parts are accessible, when the lamp is installed in a prescribed lampholder. Compliance is checked by means of the standard test finger with force of 10N.		P
	Edison screw caps (E27) compliance with gauge 7006-51A		N
	B22d caps compliances with normal incandescent lamps		N
	External metal parts shall be so designed that live parts are not accessible (test of Cl. 7)		P
Addition:	Live parts not accessible		P
	Protection in any position		P
	Insulation lacquer not reliable		P
	Class II luminaire:		P
	- insulation-encased, reinforced insulation		P
	- glass protective shields not used as supplementary insulation		P
	Covers have adequate strength		P
	Covers reliably secured		P
	Discharging of capacitors $\geq 0,5 \mu\text{F}$		N
	Portable plug connected luminaire with capacitor		N

7.	INSULATION RESISTANCE AND ELECTRIC STRENGTH AFTER HUMIDITY TREATMENT		P
7.1	After storage 48 h at a 91-95 % relative humidity and at 20-30 °C.		P
	Insulation resistance with 500 V d.c., required $\geq 4 \text{ M}\Omega$ .		P
7.2	Immediately after the insulation resistance test, electric strength test for 1 min.		P

	Type HV (220 ... 250 V): 4000 V rms		P
	Type BV (100 ... 120 V): 2xU + 1000 V		N
	No flashover or breakdown		P

8.	MECHANICAL STRENGTH		P
	Torsion resistance		P
	The mechanical strength of connection between the cap and the bulb/part of the lamp is checked by the torque		P
	- B22d 3 Nm:		N
	- E27 3 Nm:		N
Addition:	Lampholders		P
	Mounting brackets for Edison screw or bayonet-capped lampholders are subjected to testing for 1min, to the following bending moments:		P
	For E14 and B15 lampholders 1.0Nm;		N
	For E26, E27 and B22 lampholders 2.0Nm;		N
	For E39 and E40 lampholders		N
	Locked connections:		P
	- fixed arms; torque (Nm).....:		N
	- lampholder; torque (Nm).....:	0.5Nm	P
	- push-button switches; torque (Nm).....:		N
	No sharp point or edges (BS EN60598-1:2008)		P
	Impact tests:		P
	- fragile parts; energy (Nm).....:		N
	- other parts; energy (Nm) .....		P
	1) live parts		P
	2) linings		P
	3) protection		P
	4) covers		P
	Straight test finger		P

9.	CAP TEMPERATURE RISE		P
	Cap temperature rise $\Delta T_s$ not exceeding the condition specified in IEC Publication 360		P

	- B22d ..... 125K :		N
	- B15d ..... 120K :		N
	- E27 ..... 120K :		N
	- E14 ..... 125 K :		N
Addition:	The thermal requires of other parts (EN60598-1:2008)	See appended table	P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
	Thermal test (normal operation)		P
	Thermal test (abnormal operation)		P

10.	RESISTANCE TO HEAT		P
	External parts of insulating material providing protection against electric shock, and parts of insulating material retaining live parts in position, ball pressure test:		P
	Part tested; temperature (°C); diameter of impression ( $\leq 2$ mm):	Lamp plastic holder, PCB Temperature: 125°C/1h See table 10	P
	Part tested; temperature (°C); diameter of impression ( $\leq 2$ mm):	Lamp shade Temperature: 75°C/1h See table 10	P
	Part tested; temperature (°C); diameter of impression ( $\leq 2$ mm):		N

11.	RESISTANCE TO FLAME AND IGNITION		P
	Parts of insulating material retaining live parts in position and external parts of insulating material providing protection against electric shock, glow-wire test 650 °C		P
	Part tested; temperature (°C).....:	See table 11	P
	Part tested; temperature (°C).....:		N
	Part tested; temperature (°C).....:		N
	No visible flame and no sustained glowing		P
	Flames and glowing, extinguish within 30 s.....:		P

	No ignition of the tissue paper		P
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12.	FAULT CONDITIONS		P
	a) In a switch-start circuit, the starter is short-circuited		N
	b) Short-circuit across capacitors		P
	c) The lamp does not start, because one of the cathodes is broken		P
	d) The lamp does not start, although the cathode circuits are intact (de-activated lamp)		P
	e) The lamp operates, but one of the cathodes is de-activated or broken (rectifying effect)		P
	f) Opening or bridging other points in the circuit where the diagram indicates that such a fault condition may impair safety		P

<b>Addition:</b>	<b>CREEPAGE DISTANCES AND CLEARANCES (EN60598-1)</b>		<b>P</b>
	Class of protection .....	Class II	P
	Working voltage (V) .....		P
	Voltage form	Sinusoidal	P
	PTI	< 600	N
	Rated pulse voltage (kV) .....	1,2 kV	N
	(1) Live parts of different polarity: cr (mm); cl (mm).....	See table 6 (clearance and creepage distance measurements)	P
	(2) Live parts and accessible parts: cr (mm); cl (mm).....		P
	(3) Parts becoming live: cr (mm); cl (mm)....		N
	(4) Outer surface of cable: cr (mm); cl (mm):		N
	(5) Live parts of switches: cr (mm); cl (mm):		N
	(6) Live parts and supporting surface: cr (mm); cl (mm).....		N

TABLE	List of critical components and materials			
Component	manufacturers / trademark	Type / model	Value / rating	Approval/ Reference
Enclosure Material	Panyu Tianyu Plastic Industrial Co Ltd	301-G20	V-0, 75°C	UL E152735
Pin sleeving of G13 lamp cap	Chang Chun Plastics Co Ltd	T373J	Phenolic, V-0, min.thickness 1.0mm , 150 degree C	UL E59481
Input wire (L/N)	--	--	VW-1, 300V, 80°C, 24AWG	UL
PCB	--	--	Min.V-1, min105°C	UL
Aluminium PCB	Heshan Dongli Electronic Technologies Co Ltd	EPA-M2	Min.V-0, 90°C	UL E318223
Fuse (F1)	Walter Electronic Co., Ltd	ICP	T1.5AL, 250VAC	VDE40012824
Varistor (MOV1)	--	10D471K	470VAC	VDE
Thermistor (NTC1)	Nanjing Shiheng Electronics Co Ltd	MF72-10D9	240V, 2A	UL E241319
X -Capacitor (CX1)	Dain Electronic Co., Ltd.	MEX, MPX	Max. 0.1uF, 275VAC, 40/110/21, X2 type	VDE40018798
Alt.	Carli Electronics Co., Ltd	MPX	Max. 0.1µF, Min.275VAC, 40/100/21, X2 type	VDE40008520
Alt.	Ultra Tech Xiphi Enterprise Co. Ltd	HQX	Max. 0.1µF, Min.280VAC, 40/100/21, X2 type	VDE40015608
Alt.	Shenzhen SuRong Capacitors Co., Ltd.	MPX/MKP	Max. 0.1µF, Min.280VAC, 40/100/21, X2 type	VDE40008924
Mosfet (Q1)	--	--	400V, 0.8A	--
Insulation sheet	--	--	PET material, V-1, 130°C, thickness: 1.0mm	UL
Alt.				
Output cord connected to LED	--	--	VW-1, 300V, 80°C, 24AWG	UL
- Bobbin	Chang Chun Plastics Co Ltd	T375J	V-0,150°C	UL E59481
- Magnet wire	Zhejiang Hongbo Electric Line & Wire Co Ltd	UEW	155°C	UL E221719
-Alt.	Feng Ching Metal Corp	UEW	130°C	UL E172395
-Alt.	Jiangmen City Jiang Ci Electrical Appliances Enterprise Co Ltd	XUEW-UL@	130°C	UL E192838

## Test Data table

Table 9		Heating under normal operating conditions		P
No.	Test points	Rated supply voltage 240VAC/50Hz measured $\Delta t$ (K)	Limit $\Delta t$ (K)	
1	Input wire (L/N)	53.6	55	
2	PCB	70.4	80	
3	Line choke (L1) winding	68.5	95	
4	Ripple Capacitor (C1)	47.9	80	
5	Line filter (L2) winding	82.1	95	
6	Line filter (L2) core	73.4	95	
7	Line choke (L3) winding	69.4	95	
8	Lamp head	93.9	120	
9	Inside enclosure of Lamp above L2	41.5	50	
10	Outside enclosure of Lamp above L2	37.1	50	
11	Outside enclosure of Lamp cap	32.0	--	
12	Ambient	26.5°C	--	

Table 10		TABLE: ball pressure test of thermoplastics			P
Part	Test temperature (°C)	Impression diameter (mm)	Required impression diameter (mm)		
Lamp plastic holder	125	1.27	≤2.0		
Bobbin of line filter	125	0.2	≤2.0		
PCB	125	1.13	≤2.0		
Lamp shade	75	1.20	≤2.0		

Table 11		TABLE: glow wire test		P
Part at:/	Test temperature (°C)	Result		
Bobbin of line filter	650	No any flame or glowing		
Lamp plastic holder	650	No any flame or glowing		
PCB	650	No any flame or glowing		

Table 12		TABLE: tests of fault conditions			P
No.	Component Fault	Test voltage	Duration	Result	

1	Q1(pin G-S)short	240V 50Hz	5min	Unit shutdown, recovered, no hazard exist
2	Q1(pin G-D)short	240V 50Hz	5min	Unit shutdown, recovered, no hazard exist
3	Q1(pin D-S)short	240V 50Hz	5min	Unit shutdown, recovered, no hazard exist
4	D5 short	240V 50Hz	5min	Unit shutdown, recovered, no hazard exist
5	C3 short	240V 50Hz	5min	Unit shutdown, recovered, no hazard exist
6	Q2(pin G-S)short	240V 50Hz	5min	Unit shutdown, recovered, no hazard exist
7	Q2(pin G-D)short	240V 50Hz	5min	Unit shutdown, recovered, no hazard exist
8	Q2(pin D-S)short	240V 50Hz	1s	Fuse opened, Q2, Q1,R3,R5 damaged, no hazard exist
9	L2 (Pin1-2)short	240V 50Hz	1s	Fuse opened, Q2, Q1,R3,R5 damaged, no hazard exist
10	C1 short	240V 50Hz	1s	Fuse opened, no hazard exist
11	D1 short	240V 50Hz	1s	Fuse opened, no hazard exist

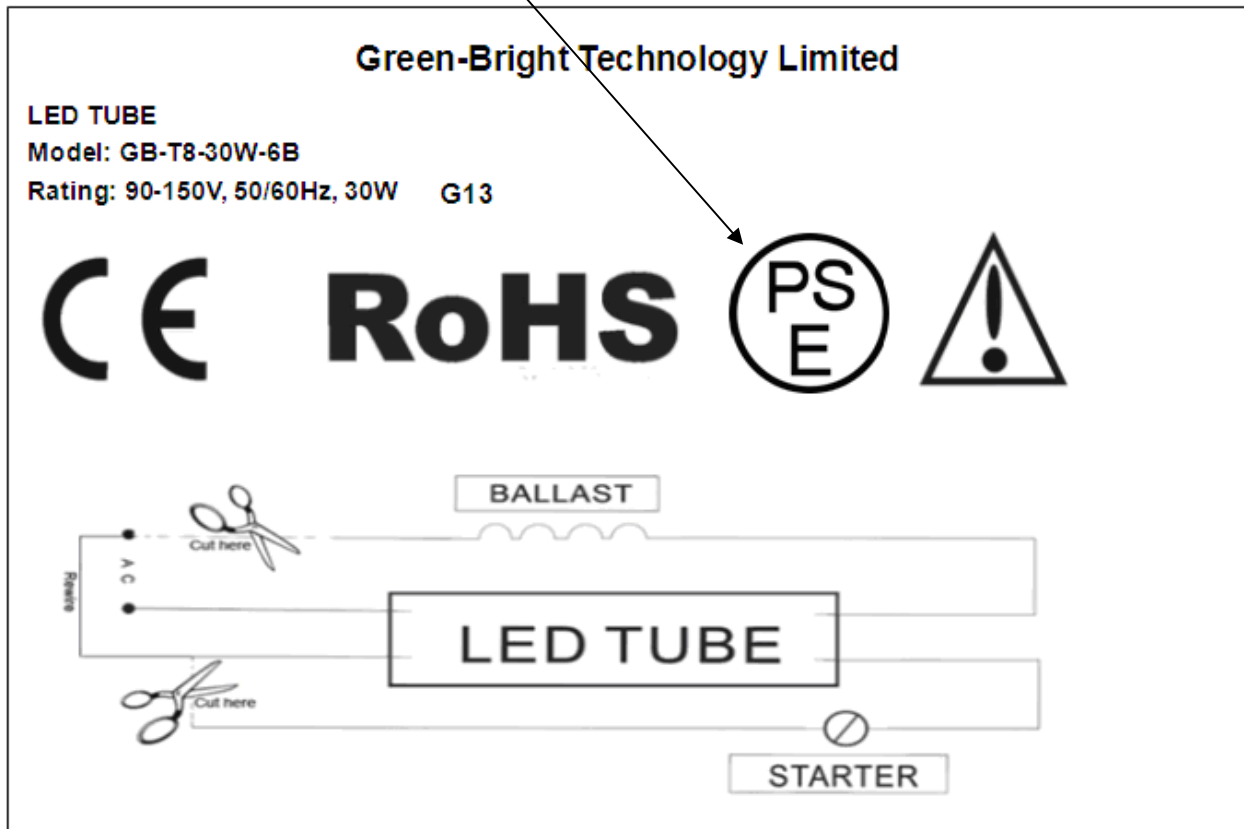
## Attachment – A

### CE Marking Label Specification

Specification: Text is Black or white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at power cord on the EUT

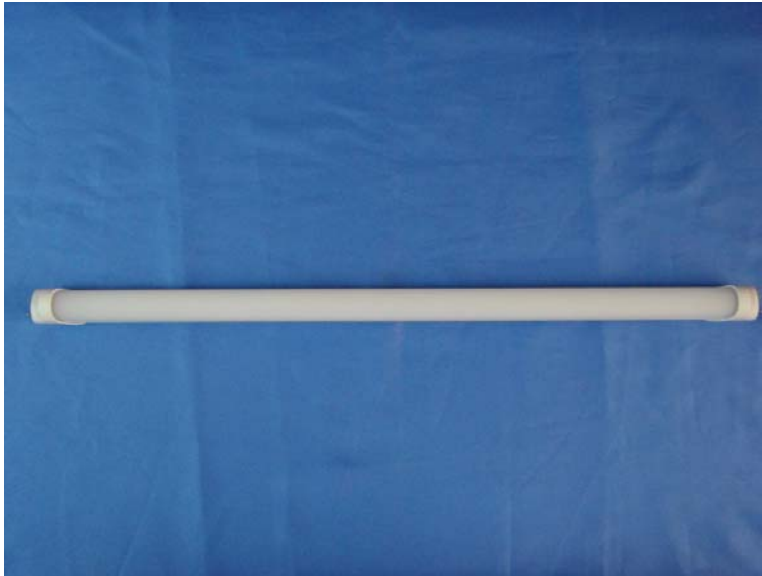
### Proposed Label Location on EUT

EUT Rear View/Proposed PSE Marking Location



## Attachment – B

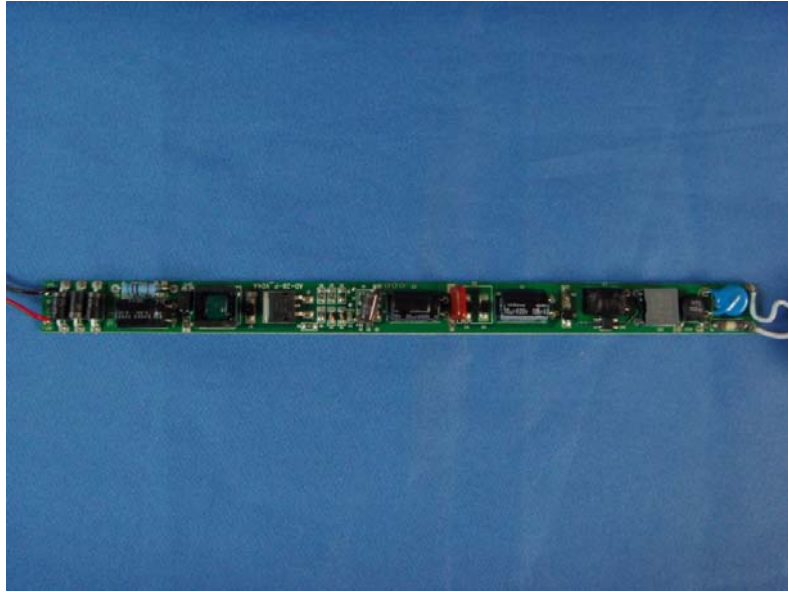
### Photo Documentation



**Photo 1: General view**



**Photo 2: Lamp cap**



**Photo 3: PCB**

END.