TEST REPORT

IEC/TR 62778: 2014

Application of IEC 62471 for the assessment of blue light hazard to light sources

Administrative Data

Report reference No . ..... :	EBO1805116-E256
Testing laboratory ..... :	Shenzhen EBO Testing Center
Address…….. :	A506, Financial port building, Xin'an Sixth Road, 82th District, Bao'an, Shenzhen, China.
Tested by(name and signature)…... :	Bernie Xia
Approved by(name and signature...:	Kevin Wang
Date of issue ..... :	May 25, 2018
Contents..... :	10 Pages.

Test specification

Standard ..... :	IEC/TR 62778-2014
Test procedure ..... :	LVD
Non-standard test method ..... :	N/A

Applicant's Name ..... :	DONGGUAN CITY BIAN ELECTRONICCO., LTD.
Address ..... :	No. 513, Lincun Avenue North, Tangxia Town, Dongguan City
Manufacturer……:	DONGGUAN CITY BIAN ELECTRONIC CO., LTD.
Address ……..:	No. 513, Lincun Avenue North, Tangxia Town, Dongguan City

Test item description..... :	8MM POWER STRAW HAT WHITE SUPER BRIGHT LED
Brand Name: ……:	BEYAND
Model/Type reference	8MM power straw hat white super bright LED
Ratings..... :	DC3.0-3.4V 150mA 0.5W

Tested lamp	☒continuous wave lamps ☐pulsed lamps
Tested lamp system	N/A
Lamp classification group	☐RG0 ☒RG 1 ☐RG 2 ☐RG 3
Lamp cap	N/A
LED Model	N/A
Furthermore marking on the lamp	N/A
Seasoning of lamps according IEC standard	0h
Used measurement instrument	SUV-3000 with Cos diffuser
Temperature by measurement	25.0℃
Information for safety use	N/A
Possible test case verdicts:	
- test case does not apply to the test object .....:	N/A
- test object does meet the requirement .....:	P (Pass)
- test object does not meet the requirement .....:	F (Fail)
Testing .....:	
Date of receipt of test item.....:	2018-5-21
Date (s) of performance of tests .....:	2018-5-25

General remarks:
The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
Throughout this report a comma (point) is used as the decimal separator. List of test equipment must be kept on file and available for review.

General product information:

The samples subjected to test were LED Source for general use.

Summary of testing:

According to IEC/TR 62778-2014, the LED modules measured at a distance of approximately 200 mm and 0.040 rad field.

And after the test, the blue light hazard of all the LED models list above were classified as **RG1**.

Manufacture: DONGGUAN CITY BIAN ELECTRONIC CO., LTD.

Manufacture address: No. 513, Lincun Avenue North, Tangxia Town, Dongguan City

Factory: Same as manufacture.

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IEC 62778			
Clause	Requirement + Test	Result-Remark	Verdict
7	Measurement information flow		P
7.1	Basic flow		P
	The considerations enabling the flow of information from one level to the next are based on		P
	- the 'law of conservation of luminance'		P
	- the findings as explained in Clause 5 of this Technical Report		P
	If the radiance measurement on the primary light source gives an L_B value in the RG0 (0 W/(m^2.sr) to 100 W/(m^2.sr)) or RG1 (100 W/(m^2.sr) to 10 000 W/(m^2.sr)) region	LB=336.41	P
	If the radiance measurement on the primary light source gives an LB value in the RG2 region (10 000 W/(m^2.sr) to 4 000 000 W/(m^2.sr))		N/A
	If in the RG2 region, the clause 5 can be applied	See clause 5	N/A
	If in the RG2 situation when the illuminance at the viewing position is above a threshold value E_{thr}, which can be calculated using the RG1 upper limit for E_B(1 W/m^2) and the $K_{B,V}$ value	E_{thr} =	N/A
	E_{thr} for RG2:		N/A
	RG2 at distances where the luminaire containing the light source produces an illuminance above E_{thr}	E_{thr} =	N/A
	RG1 at distances where the luminaire containing the light source produces an illuminance below E_{thr}	E_{thr} =	N/A
	If E_{thr} for RG2 is produced, the risk group classification depends on the use conditions,		N/A
	This distance depends on the luminaire optics and can therefore not be transferred from primary light source to luminaire		N/A
	For the calculation of the distance from the light distribution curve and the E_{thr} value, the following formula is applicable: $E_{thr} = \frac{I \cdot \cos\alpha}{d^2}$	d=	N/A
7.2	Conditions for the radiance measurement		P
	200 mm distance and 0.011 rad field of view give a true radiance value if the field of view underfills the emitting area of the sorce, if measurement distance is not 200 mm.	Test distance: 200 mm Field of view: 0.040 rad	P

IEC 62778			
Clause	Requirement + Test	Result-Remark	Verdict
	The test conditions of the primary light source	Test current:	N/A
	If the field of view of 0.011 rad overfills the light source at 200 mm distance, and not give a true radiance value, and has two routes, if measurement distance is not 200 mm.	Test distance: Field of view:	N/A
	a) The field of view of the measurement can be reduced such that it underfills the light source. a radiance value LB is determined	See clause 7.1	N/A
	b) The measurement is performed as an irradiance measurement. This gives the data to calculate Ethr. Since no radiance measurement is performed, worst case is assumed, and only outcome c) of 7.1 can be generated: the Ethr value for RG2	See clause 7.1	N/A
7.3	Spacial cases (I): Replacement by a lamp or LED module of another type		N/A
	when a lamp in a luminaire can be replaced by a lamp of another type, including LED replacement lamps		N/A
7.4	Special cases (II): Arrays and clusters of primary light sources		N/A
	LED modules consist of an array of individual LED packages		N/A
	The luminance of the single LED package is taken as the average luminance of the entire array	Luminance:	N/A
8	Risk group classification	RG1	P
Annex C	Summary of recommendations to assist the consistent application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires		N/A
C.2	Situation of RG0 or RG1 classification not requiring radiance or irradiance measurement		N/A
C.2.1	Boundary conditions		N/A
	If, for white light only, the true luminance of the light source is less than 10 000 cd/m^2 , it is classified RG0	True luminance:	N/A
	for white light only, the light source and any luminaire using the light source are considered RG0 or RG1, without further spectral assessment, where any one of the conditions given in C.2.2 and C.2.3 apply.		N/A
C.2.2	True luminance values giving risk group not greater than RG1		N/A

IEC 62778			
Clause	Requirement + Test	Result-Remark	Verdict
	If the true luminance of the light source complies with the table C.1 for the given correlated colour temperatures (CCT) its classification will not be greater than RG1	True luminance: CCT:	N/A
C.2.3	Illuminance values giving risk group not greater than RG1		N/A
	If the true luminance of the light source does not comply with the values in C.2.2, but the illuminance from the luminaire in the direction of the maximum intensity, at the specified distance, complies with the table C.2 values for the given correlated colour temperatures (CCT) its classification will not be greater than RG1	Illuminance: the specified distance: CCT:	N/A
C.3	Situation for the classification of light sources larger than 2,2 mm and luminaires using these light sources		N/A
	For the situation of light sources with a diameter>2.2 mm, the following should be applied:		N/A
	a) The IEC 62471 radiance measurement is made at a distance of 200 mm with a field of view of 0,011 rad at current(s) as defined in 7.2.	See clause 7.2	N/A
	b) If LB < 100W/(m^2.sr), the light source is classified RG0.	L_B=	N/A
	c) If LB < 10 000W/(m^2.sr) and > 100W/(m^2.sr), the light source is classified RG1.	L_B=	N/A
	d) Where LB > 10 000 W/(m2.sr) the maximum illuminance E_{thr} appropriate to an RG1/RG2 border classification (E_B = 1W/m^2) should be calculated.	E_{thr}=	N/A
C.4	Situation for the classification of light sources smaller than 2,2 mm and luminaires using these light sources		N/A
	For the situation of small light sources with a diameter< 2.2 mm, the following should be applied:		N/A
	The measurement may be performed as detailed by either item a) or item b) of 7.2 to establish the RG0, RG1 rating or E_{thr} value of the light source.	See clause 7.2	N/A
C.5	Situation for the classification of light sources that pose practical difficulties in measurements at 200mm		N/A
	The measurement may be performed at the lowest distance value where it is practically possible to perform it		N/A
	If, at this distance, and at a field of view of 0,011 rad, this light source is large (i.e. its subtended angle is larger than 0,011 rad), follow the procedure as	See clause C.3	N/A

IEC 62778			
Clause	Requirement + Test	Result-Remark	Verdict
	outlined in Clause C.3.		
	If, at this distance, and at a field of view of 0,011 rad, this light source is small (i.e. its subtended angle is smaller than 0,011 rad), follow the procedure as outlined in Clause C.4.	See clause C.4	N/A

Model: 8MM power straw hat white super bright LED

Risk		Blue light	
Action spectrum		B(λ)	
Symbol		LB	
Units		W/(m^2.sr)	
-		Limit	Result
Risk group number	RG0	0~100	-
	RG1	100~10000	8374.23
	RG2	10000~4000000	-
	RG3	>4000000	-

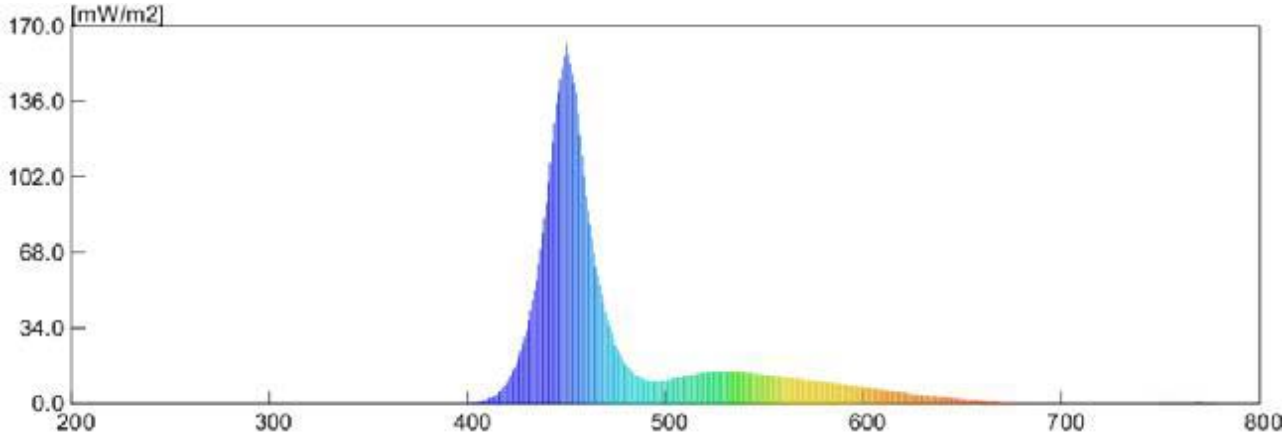
Rated CCT	Luminance *L* (Mcd/m^2)
CCT＜2 350 K	40
2 350 K ＜CCT≤2 850 K	18,5
2 850 K＜CCT≤3 250 K	14,5
3 250 K＜CCT≤3 750 K	11
3 750 K＜CCT≤4 500 K	8,5
4 500 K＜CCT≤5 750 K	6,5
5 750 K＜CCT≤8 000 K	5
The manufacturer’s rated data for CCT and luminance may be used as a basis for this assessment.	

Table C.1 - Luminance values giving risk group not greater than RG1

Rated CCT	Illuminance *E* (lx)
CCT＜2 350 K	4 000
2 350 K ＜CCT≤2 850 K	1 850
2 850 K＜CCT≤3 250 K	1 450
3 250 K＜CCT≤3 750 K	1 100
3 750 K＜CCT≤4 500 K	850
4 500 K＜CCT≤5 750 K	650
5 750 K＜CCT≤8 000 K	500

Table C.2 - Illuminance values giving risk group not greater than RG1

Measured Spectrum data:



LED Source: 8MM power straw hat white super bright LED

Photographs of the EUT

LED Source: 8MM power straw hat white super bright LED

(EBO authenticate the photo on original report only)

*** End of Report ***