Test Report for verification of Ecodesign and Energy labelling requirement for Light source Implementation measure (EU) 2019/2020 and (EU) 2019/2015

Report reference No.....:	BL250722001-9
Date of issue.....:	2025-08-11
Project handler.....:	Sam Chen
Testing laboratory.....:	Shenzhen Belling Efficiency Testing Lab Co.,Ltd
Address.....:	1Floor, No.1 Building, Meibaohe Industrial Park, Dalang Street, Longhua District, Shenzhen, Guangdong Prov.518101 China
Testing location.....:	Same as above.
Applicant.....:	EI Dongguan Limited
Address.....:	No.3 Fukang West Road, Honghualin Industrial Zone, Chongkoushequ, Houjie Dongguan, 523947 China
Contact person.....:	N/A
Standard.....:	Test report form is based on the following requirements: (EU) 2019/2020:2019-10-01 with Corrigendum; (EU) 2019/2015:2019-03-11; (EU) 2021/341:2021-02-23; (EU) 2021/340:2020-12-17
TRF originated by.....:	Shenzhen Belling Efficiency Testing Lab Co.,Ltd, Mr. Jason zhou
Copyright blank test report.....:	This test report is based on the content of the internal test program. The test program considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by Shenzhen Belling Efficiency Testing Lab Co.,Ltd Shenzhen Belling Group takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
Non-standard test method .....:	☒ No ☐ Yes, see details under Summary
National deviations.....:	None
Number of pages (Report).....:	34(Including all Attachment)
Number of pages (Attachments).....:	5
Compiled by..... : Sam Chen (+ signature)	Approved by..... : Jason zhou (+ signature)

DRAFT

Test sample.....:	FER067
Type of test object..... :	Pre-production sample
Trademark..... :	?????
Model and/or type reference..... :	BALAD2 H25(3500K), BALAD2 H25(5000K)
Rating(s)..... :	DC 3.2V, 1.6W, 3500K, 5000K
Manufacturer..... :	EI Dongguan Limited
Address.....:	No.3 Fukang West Road, Honghualin Industrial Zone, Chongkoushequ, Houjie Dongguan, 523947 China
Sub-contractors/ tests (clause)..... :	N/A
Address.....:	N/A

Order description…….:		
	☐	Complete test according to TRF
	☐	Partial test according to manufacturer's specifications
	☒	Preliminary test
	☐	Spot check

Date of order..... ..:	2025-07-15
Date of receipt of test item.....:	2025-07-22
Date(s) of performance of test..... :	2025-07-24 to 2025-07-30

Test item particulars:

Light source type:

- LED (Light Emitting Diode) ☒
- OLED (Organic Light Emitting Diode) ☐
- Incandescent Lamp ☐
- CFL (Compact Fluorescent Lamp) ☐
- CFLni (Compact Fluorescent Lamp without integrated ballast) ☐
- HL (Halogen Lamp) ☐
- FL (Fluorescent Lamp, including circular, U-shape, etc.) ☐
- LFL (Linear Fluorescent Lamp) ☐
- Magnetic induction light source ☐
- HID (High-intensity Discharge lamp, including metal halide, high-pressure sodium and mercury vapour type) ☐

Control gear:

- Integrated ☐

DRAFT

- External	☐
Use of module:	
- Indoor	☒
- Outdoor	☒
- Industry	☐
Envelope transparency:	
- Clear	☐
- Non-clear	☒
Dimmable module:	☒
Programmable lamp:	☐
Lamp / Module type:	☒ non - directional ☐ directional
Module with anti-glare shield:	☐
Lamp cap installed……	
Containing product:	
- Containing product with non-separateable light source(s) or/and control gear(s)	☒
- Containing product with separateable light source(s) or/and control gear(s)	☐
Declared data:	
Rated voltage ……(V):	DC 3.2
Rated lamp power ……(W):	1.6
Rated useful luminous flux……(lm):	BALAD2 H25(3500K): 170 BALAD2 H25(5000K): 180
Rated beam angle ……(°):	-
Rated CCT ……(K):	3500, 5000
Rated life time ……(h):	25000

DRAFT

Purpose of the product (Description of intended use):

The product covered in this report is FER067 for indoor and outdoor use.

Attachments:

No. 1: Photometric test record of one lamp at initial measurement;
No. 2: Light intensity distribution record of one lamp at initial measurement;
No. 3: Equipment list;
No. 4: Photo documentation.

General remarks:

"(see remark #)" refers to a remark appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a comma is used as the decimal separator.
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 testing laboratory.

DRAFT

Summary of testing:

For Ecodesign requirement:
The product meets the energy efficiency & information requirement in EU No. 2019/2020 as specified in following details, and the functional requirement in EU No. 2019/2020.

For Energy labelling requirement:

Requirement	Rated	Measured
Model No.	BALAD2 H25(3500K)	BALAD2 H25(3500K)
η_{TM}	98.39	102.42
EE class	F	F
Ec (kWh/1000h)	2	2

Requirement	Rated	Measured
Model No.	BALAD2 H25(5000K)	BALAD2 H25(5000K)
η_{TM}	104.18	105.24
EE class	F	F
Ec (kWh/1000h)	2	2

Energy efficiency classes of light sources

Energy efficiency class	Total mains efficacy η_{TM} (lm/W)
A	$210 \leq \eta_{TM}$
B	$185 \leq \eta_{TM} < 210$
C	$160 \leq \eta_{TM} < 185$
D	$135 \leq \eta_{TM} < 160$
E	$110 \leq \eta_{TM} < 135$
F	$85 \leq \eta_{TM} < 110$
G	$\eta_{TM} < 85$

Remark:

☐ deviation(s) found
☒ no deviations found

If additional information is necessary, please provide N/A
Copy of marking plate:
Possible test case verdicts:

- test case does not apply to the test object.....:	N(.A.) / not included in the order
- test object does meet the requirement.....:	P(ass)
- test object does not meet the requirement.....:	F(ail)
Possible suffixes to the verdicts:	
- suffix for detailed information for the client……..…..:	- C(omment)
- suffix for important information for factory inspection..:	- M(anufacturing)

DRAFT

Clause	Requirement + Test	Result – Remark	Verdict
(EU) 2019/2020 - Ecodesign requirement:			
0	**Measurement methods**		P
	Recognised state of art measurement methods incl. the one published in the Official Journal taking into account the measurement methods of (EU) 2019/2020		P
1.	Sample		P
	Number of sample used for test:	10 pcs	P
2.	**Energy efficiency requirements (Annex II, clause 1 of EU 2019/2020)**		P
2.1	Maximum allowed power P_{onmax} of light source (Annex II, clause 1, (a) of EU 2019/2020)		P
	From 1 September 2021, the declared power consumption of a light source P_{on} shall not exceed the maximum allowed power P_{onmax} (in W), defined as a function of the declared useful luminous flux Φ_{use} (in lm) and the declared colour rendering index CRI (-) as follows	P_{on}: 1.6 $P_{on} \leq P_{onmax}$	P
	$P_{onmax} = C \times (L + \Phi_{use}/(F \times \eta)) \times R$	P_{onmax}: 2.98	P
	where:		
	-The values for threshold efficacy (η in lm/W) and end loss factor (L in W) are specified in Table 1, depending on the light source type. They are constants used for computations and do not reflect true parameters of light source. The threshold efficacy is not the minimum required efficacy; the latter can be computed by dividing the useful luminous flux by the computed maximum allowed power	η: 120 L: 1.5	P
	Table 1 **Threshold efficacy (η) and end loss factor (L)**		P

Light source description	η [lm/W]	L [W]
LFL T5-HE	98,8	1,9
LFL T5-HO, 4 000 ≤ Φ ≤ 5 000 lm	83,0	1,9
LFL T5-HO, other lm output	79,0	1,9
FL T5 circular	79,0	1,9
FL T8 (including FL T8 U-shaped)	89,7	4,5
From 1 September 2023, for FL T8 of 2-, 4- and 5-foot	120,0	1,5
Magnetic induction light source, any length/flux	70,2	2,3
CFLni	70,2	2,3
FL T9 circular	71,5	6,2
HPS single-ended	88,0	50,0

Clause	Requirement + Test	Result – Remark	Verdict

Light source description	η [lm/W]	L [W]
HPS double-ended	78,0	47,7
MH ≤ 405 W single-ended	84,5	7,7
MH > 405 W single-ended	79,3	12,3
MH ceramic double-ended	84,5	7,7
MH quartz double-ended	79,3	12,3
Organic light-emitting diode (OLED)	65,0	1,5
Until 1 September 2023: HL G9, G4 and GY6.35	19,5	7,7
HL R7s ≤ 2 700 lm	26,0	13,0
Other light sources in scope not mentioned above	120,0	1,5 (*)

(*) For connected light sources (CLS) a factor L = 2,0 shall be applied.

	-Basic values for correction factor (C) depending on light source type, and additions to C for special light source features are specified in Table 2.	C: 1.00	P

Table 2

Correction factor C depending on light source characteristics

Light source type	Basic C value
Non-directional (NDLS) not operating on mains (NMLS)	1,00
Non-directional (NDLS) operating on mains (MLS)	1,08
Directional (DLS) not operating on mains (NMLS)	1,15
Directional (DLS) operating on mains (MLS)	1,23
Special light source feature	**Bonus on C**
FL or HID with CCT > 5 000 K	+0,10
FL with CRI > 90	0,10
HID with second envelope	+0,10
MH NDLS > 405 W with non-clear envelope	+0,10
DLS with anti-glare shield	+0,20
Colour-tuneable light source (CTLS)	+0,10
High luminance light sources (HLLS)	+0,0058 • Luminance-HLLS - 0,0167

	Where applicable, bonuses on correction factor C are cumulative		N/A
	The bonus for HLLS shall not be combined with the basic C-value for DLS (basic C-value for NDLS shall be used for HLLS)		N/A
	-Efficacy factor (F) is:		P
	1,00 for non-directional light sources (NDLS, using total flux)	F: 1.00	P
	0,85 for directional light sources (DLS, using flux in a cone)	F:	N/A

Clause	Requirement + Test	Result – Remark	Verdict
	-CRI factor (R) is:		P
	0,65 for CRI ≤ 25	R:	N/A
	(CRI+80)/160 for CRI > 25, rounded to two decimals	R: 1.02	P
	Light sources that allow the end-user to adapt the spectrum and/or the beam angle of the emitted light, thus changing the values for useful luminous flux, colour rendering index (CRI) and/or correlated colour temperature (CCT), and/or changing the directional/non-directional status of the light source, shall be evaluated using the reference control settings.		P
	Standby power P_{sb} and networked standby power P_{net} of light source		N/A
	The standby power P_{sb} of a light source shall not exceed 0,5 W	P_{sb}:	N/A
	The networked standby power P_{net} of a connected light source shall not exceed 0,5 W	P_{net}:	N/A
	The allowable values for P_{sb} and P_{net} shall not be added together		N/A
	CLS and CSCG designed and marketed specifically for scene-lighting use in film-studios, TV-studios and locations, and photographic studios and locations, or for stage-lighting use in theatres, discos and during concerts or other entertainment events, for connection to high speed control networks (utilising signalling rates of 250 000 bits per second and higher) in alwayslistening mode, shall be exempt from the requirements on standby (P_{sb}) and on networked standby (P_{net}) of points 1(a) and 1(b) of Annex II		N/A
3.	**Functional requirements (Annex II, clause 2 of EU 2019/2020)**		P
	From 1 September 2021, the functional requirements should apply for light sources (Annex II, clause 2, table 4 of EU 2019/2020)		P
3.1	Colour rendering		P
	CRI ≥ 80	CRI: 83.5	P
	except for HID with Φ_{use} > 4 klm and for light sources intended for use in outdoor applications, industrial applications or other applications where lighting standards allow a CRI< 80, when a clear indication to this effect is shown on the light source packaging and in all relevant printed and electronic documentation	CRI:	N/A

Clause	Requirement + Test	Result – Remark	Verdict
3.2	Displacement factor (DF, cos φ1) at power input P_{on} for LED and OLED MLS		N/A
	No limit at P_{on} ≤ 5 W	P_{on}: 1.6	N/A
	DF ≥ 0,5 at 5 W < P_{on} ≤ 10 W	P_{on}: DF:	N/A
	DF ≥ 0,7 at 10 W < P_{on} ≤ 25 W	P_{on}: DF:	N/A
	DF ≥ 0,9 at 25 W < P_{on}	P_{on}: DF:	N/A
3.3	Lumen maintenance factor (for LED and OLED)		P
	The lumen maintenance factor X_{LMF}% after endurance testing shall be at least $X_{LMF,MIN}$% calculated as follows		N/A
	$X_{LMF,MIN}\% = 100 \times e^{\frac{(3000 \times \ln(0.7))}{L_{70}}}$ where L_{70} is the declared $L_{70}B_{50}$ lifetime (in hours)	L_{70}: 25000 $X_{LMF,MIN}$%: 95.81% X_{LMF}%: -	N/A
	If the calculated value for $X_{LMF,MIN}$ exceeds 96,0 %, an $X_{LMF,MIN}$ value of 96,0 % shall be used	$X_{LMF,MIN}$%=96,0%	N/A
3.4	Survival factor (SF) (for LED and OLED)		P
	At least 9 light sources of the 10 test samples must be operational after completing the endurance testing	_10_light sources are operational after endurance testing	P
3.5	Colour consistency for LED and OLED light source		P
	Variation of chromaticity coordinates within a sixstep MacAdam ellipse or less.	2.5	P
3.6	Flicker for LED and OLED MLS		N/A
	P_{st} LM ≤ 1,0 at full-load		N/A
3.7	Stroboscopic effect for LED and OLED MLS		N/A
	SVM ≤ 0,4 at full-load		N/A
	except for HID with Φ_{use} > 4 klm and for light sources intended for use in outdoor applications, industrial applications or other applications where lighting standards allow a CRI< 80		N/A
4.	**Information requirements (Annex II, clause 3 of EU 2019/2020)**		**P**
	From 1 September 2021 the following information requirements shall apply:		P
4.1	Information to be displayed on the light source itself		N/A

DRAFT

Clause	Requirement + Test	Result – Remark	Verdict
	For all light sources, except CTLS, LFL, CFLni, other FL, and HID, the value and physical unit of the useful luminous flux (lm) and correlated colour temperature (K) shall be displayed in a legible font on the surface if, after the inclusion of safety-related information, there is sufficient space available for it without unduly obstructing the light emission		N/A
	For directional light sources, the beam angle (°) shall also be indicated		N/A
	If there is room for only two values, the useful luminous flux and the correlated colour temperature shall be displayed		N/A
	If there is room for only one value, the useful luminous flux shall be displayed		N/A
4.2	Information to be visibly displayed on the packaging		N/A
4.2.1	Light source placed on the market, not in a containing product		N/A
	If a light source is placed on the market, not in a containing product, in a packaging containing information to be visibly displayed at a point-of-sale prior to its purchase, the following information shall be clearly and prominently displayed on the packaging		N/A
(a)	the useful luminous flux (Φ_{use}) in a font at least twice as large as the display of the on-mode power (P_{on}), clearly indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°)		N/A
(b)	the correlated colour temperature, rounded to the nearest 100 K, also expressed graphically or in words, or the range of correlated colour temperatures that can be set		N/A
(c)	the beam angle in degrees (for directional light sources), or the range of beam angles that can be set		N/A
(d)	electrical interface details, e.g. cap- or connector type, type of power supply (e.g. 230 V AC 50 Hz, 12 V DC)		N/A
(e)	the $L_{70}B_{50}$ lifetime for LED and OLED light sources, expressed in hours		N/A
(f)	the on-mode power (P_{on}), expressed in W		N/A
(g)	the standby power (P_{sb}), expressed in W and rounded to the second decimal. If the value is zero, it may be omitted from the packaging		N/A

Clause	Requirement + Test	Result – Remark	Verdict
(h)	the networked standby power (P_{net}) for CLS, expressed in W and rounded to the second decimal. If the value is zero, it may be omitted from the packaging		N/A
(i)	the colour rendering index, rounded to the nearest integer, or the range of CRI-values that can be set		N/A
(j)	if CRI< 80, and the light source is intended for use in outdoor applications, industrial applications or other applications where lighting standards allow a CRI< 80, a clear indication to this effect. For HID light sources with useful luminous flux 4 000 lm, this indication is not mandatory		N/A
(k)	if the light source is designed for optimum use in non-standard conditions (such as ambient temperature Ta≠ 25 °C or specific thermal management is necessary): information on those conditions		N/A
(l)	a warning if the light source cannot be dimmed or can be dimmed only with specific dimmers or with specific wired or wireless dimming methods. In the latter cases a list of compatible dimmers and/or methods shall be provided on the manufacturer's website		N/A
(m)	if the light source contains mercury: a warning of this, including the mercury content in mg rounded to the first decimal place		N/A
(n)	if the light source is within the scope of Directive 2012/19/EU, without prejudice to marking obligations pursuant to Article 14(4) of Directive 2012/19/EU, or contains mercury: a warning that it shall not be disposed of as unsorted municipal waste		N/A
	Items (a) to (d) shall be displayed on the packaging in the direction meant to face prospective buyer; for other items this is also recommended, if space permits		N/A
	For light sources that can be set to emit light with different characteristics, the information shall be reported for the reference control settings. In addition, a range of obtainable values may be indicated		N/A
	The information does not need to use the exact		N/A

Clause	Requirement + Test	Result – Remark	Verdict
	wording on the list above. Alternatively, it may be displayed in the form of graphs, drawings or symbols		
5.	**Circumvention (Article 7 of EU 2019/2020)**		**P**
	The manufacturer, importer or authorised representative shall not place on the market products designed to be able to detect they are being tested (e.g. by recognising the test conditions or test cycle), and to react specifically by automatically altering their performance during the test with the aim of reaching a more favourable level for any of the parameters declared by the manufacturer, importer or authorised representative in the technical documentation or included in any of the documentation provided.		P
	The energy consumption of the product and any of the other declared parameters shall not deteriorate after a software or firmware update when measured with the same test standard originally used for the declaration of conformity, except with explicit consent of the end-user prior to the update.		P

DRAFT

Table 1	Test data											
Model:	BALAD2 H25(3500K)											
Test voltage	DC 3.2V					Frequency (Hz):		/				
Φ_{use} measured at:	Total Luminous Flux					Ambient (T/rh) (°C / %)		24.9 / 53.0				
Test item	Measured Value										Average	Limit
Sample:	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10		
U (V) [1]	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	--
I (A) [1]	0.494	0.497	0.494	0.497	0.494	0.491	0.494	0.500	0.494	0.500	0.495	--
P (W) [1]	1.58	1.59	1.58	1.59	1.58	1.57	1.58	1.60	1.58	1.60	1.59	≤ P_{onmax} 2.98
cos φ1 [1] [2]	-	-	-	-	-	-	-	-	-	-	-	--
Φ_{Total} (lm) [1]	176.78	173.52	178.16	172.13	171.76	175.92	174.55	176.52	179.48	179.85	175.87	--
Φ_{use} (lm) [1]	176.78	173.52	178.16	172.13	171.76	175.92	174.55	176.52	179.48	179.85	175.87	--
CCT(K) [1]	3496	3491	3493	3487	3506	3511	3503	3483	3499	3517	3499	--
Ra [1]	83.6	83.3	83.6	83.6	83.7	83.4	83.6	83.4	83.5	83.6	83.5	--
R9 [1]	11	12	11	11	12	11	11	10	11	10	11	--
Color consistency	2.5	2.1	2.2	2.2	2.5	2.6	2.8	2.6	2.5	2.7	2.5	--
x [1]	0.4044	0.4043	0.4041	0.4047	0.4045	0.4038	0.4039	0.4039	0.4042	0.4042	0.4042	--
y [1]	0.3877	0.3875	0.3883	0.3881	0.3879	0.3879	0.3874	0.3872	0.3884	0.3884	0.3879	--
SF @ 3000h [3][4]	S	S	S	S	S	S	S	S	S	S	S	≥90%
Φuse, @ 3000h (lm) [5]	-	-	-	-	-	-	-	-	-	-	-	--
X_{LMF}% @ 3000h [3][4][5]	-	-	-	-	-	-	-	-	-	-	-	≥XLMF, MIN% 95.81%

Supplementary information:

[1] initial measurement value after aging of: 30 min

[2] 'displacement factor (DF) (cos φ1)' means the cosine of the phase angle φ1 between the fundamental harmonic of the mains supply voltage and the fundamental harmonic of the mains current. It is used for mains light sources using LED- or OLED-technology. The displacement factor is measured at full-load, for the reference control settings where applicable, with any lighting control parts in control mode and nonlighting parts disconnected, switched off or set to minimum power consumption according to the manufacturer's instructions

[3] 'survival factor' (SF) means the defined fraction of the total number of light sources that continue to operate at a given time under defined conditions and switching frequency

[4] 'lumen maintenance factor' (XLMF) means the ratio of the luminous flux emitted by a light source at a given time in its life to the initial luminous flux

[5] '3000h' referes to the total operation time of the cycling test of (EU)2019/2020 Annex V, the total test time is 3600h (1200 cycle of 150min 'ON' and 30min 'OFF')

DRAFT

Table 1	**Test data**		
Model:	**BALAD2 H25(5000K)**		
Test voltage	**DC 3.2V**	**Frequency (Hz):**	**/**
Φ_{use} measured at:	**Total Luminous Flux**	**Ambient (T/rh) (°C / %)**	**24.9 / 53.0**
Test item	Measured Value		
Sample:	**A1**	**Average**	**Limit**
U (V) [1)]	3.2	3.2	--
I (A) [1)]	0.500	0.500	--
P (W) [1)]	1.6	1.6	≤1.6
cos φ1 [1) 2)]	-	-	--
Φ_{Total} (lm) [1)]	181.84	181.84	--
Φ_{use} (lm) [1)]	181.84	181.84	≥180
CCT(K) [1)]	5064	5064	--
Ra [1)]	84.9	84.9	-
R9 [1)]	15	15	--
Color consistency	1.3	1.3	＜6
x [1)]	0.3438	0.3438	--
y [1)]	0.3565	0.3565	--

Supplementary information:

[1)] initial measurement value after aging of: 30 min

[2)] 'displacement factor (DF) (cos φ1)' means the cosine of the phase angle φ1 between the fundamental harmonic of the mains supply voltage and the fundamental harmonic of the mains current. It is used for mains light sources using LED- or OLED-technology. The displacement factor is measured at full-load, for the reference control settings where applicable, with any lighting control parts in control mode and nonlighting parts disconnected, switched off or set to minimum power consumption according to the manufacturer's instructions

only for reference.

DRAFT

(EU) 2019/2015 - Energy labelling requirement:				
6.	**Measurment methods**			**P**
	Recognised state of art measurement methods incl. the one published in the Official Journal taking into account the measurement methods of EU 2019/2015			P
7.	**Method for calculating the total mains efficacy (Annex II, EU 2019/2015)**			**P**
7.1	Calculation the total mains efficacy			P
	The energy efficiency class of light sources shall be determined as set out in Annex II, Table 1 of EU 2020/2015		See attached table 2	P
	on the basis of the total mains efficacy η_{TM}, which is calculated by dividing the declared useful luminous flux Φ_{use} (expressed in lm) by the declared on mode power consumption P_{on} (expressed in W) and multiplying by the applicable factor F_{TM} of Annex II, Table 2 of EU 2019/2015 as follow: $\eta_{TM} = (\Phi_{use}/P_{on}) \times F_{TM}$ (lm/W)		See attached table 2	P
	declared useful luminous flux Φ_{use} (expressed in lm)		See attached table 2	P
	declared on mode power consumption P_{on} (expressed in W)		See attached table 2	P
	applicable factor F_{TM} of Annex II, Table 2 of EU 2019/2015			-
	Factors F_{TM} by light source type (Table 2 of Annex II, EU 2019/2015)			-
	Light source type	Factor F_{TM}		P
	Non-directional (NDLS) operating on mains (MLS)	1,000		N/A
	Non-directional (NDLS) not operating on mains (NMLS)	0,926	0.926	P
	Directional (DLS) operating on mains (MLS)	1,176		N/A
	Directional (DLS) not operating on mains (NMLS)	1,089		N/A
7.2	CALCULATION OF THE ENERGY CONSUMPTION			P
	The weighted energy consumption (Ec) is calculated in kWh/1000 h as follows and is rounded to two decimal places: $Ec=P_{on}\times 1000h/1000$		See attached table 2	P
8.	**Evaluation**			**P**
	Declared values are not more favorable then value based on measured data		See attached table 2	P
9.	**Exemptions (Annex IV of EU 2019/2015)**			**N/A**
9.1	This Regulation shall not apply to light sources			N/A

	specifically tested and approved to operate		
(a)	in radiological and nuclear medicine installations, as defined in Article 3 of Council Directive 2009/71/Euratom		N/A
(b)	for emergency use		N/A
(c)	in or on military or civil defence establishments, equipment, ground vehicles, marine equipment or aircraft as set out in Member States' regulations or in documents issued by the European Defence Agency		N/A
(d)	in or on motor vehicles, their trailers and systems, interchangeable towed equipment, components and separate technical units, as set out in Regulation (EC) No 661/2009 of the European Parliament and of the Council, Regulation (EU) No 167/2013 of the European Parliament and of the Council and Regulation (EU) No 168/2013 of the European Parliament and of the Council		N/A
(e)	in or on non-road mobile machinery as set out in Regulation (EU) 2016/1628 of the European Parliament and of the Council and in or on their trailers		N/A
(f)	in or on interchangeable equipment as set out in Directive 2006/42/EC of the European Parliament and of the Council intended to be towed or to be mounted and fully raised from the ground or that cannot articulate around a vertical axis when the vehicle to which it is attached is in use on a road by vehicles as set out in Regulation (EU) No 167/2013		N/A
(g)	in or on civil aviation aircraft as set out in Commission Regulation (EU) No 748/2012		N/A
(h)	in railway vehicle lighting as set out in Directive 2008/57/EC of the European Parliament and of the Council		N/A
(i)	in marine equipment as set out in Directive 2014/90/EU of the European Parliament and of the Council		N/A
(j)	in medical devices as set out in Council Directive 93/42/EEC or Regulation (EU) 2017/745 of the European Parliament and of the Council and in vitro medical devices as set out in Directive 98/79/EC of the European Parliament and of the Council		N/A
9.2	In addition, this Regulation shall not apply to		N/A

DRAFT

(a)	electronic displays (e.g. televisions, computer monitors, notebooks, tablets, mobile phones, ereaders, game consoles), including but not limited to displays within the scope of Commission Regulation (EU) 2019/2021 and of Commission Regulation (EU) No 617/2013		N/A
(b)	Light sources in range hoods within the scope of Commission Delegated Regulation (EU) No 65/2014		N/A
(c)	Light sources in battery-operated products, including but not limited to e.g. torches, mobile phones with an integrated torch light, toys including light sources, desk lamps operating only on batteries, armband lamps for cyclists, solarpowered garden lamps		N/A
(d)	Light sources on bicycles and other non-motorised vehicles		N/A
(e)	Light sources for spectroscopy and photometric applications, such as for example UV-VIS spectroscopy, molecular spectroscopy, atomic absorption spectroscopy, nondispersive infrared (NDIR), fourier-transform infrared (FTIR), medical analysis, ellipsometry, layer thickness measurement, process monitoring or environmental monitoring		N/A
9.3	Any light source within the scope of this Delegated Regulation shall be exempt from the requirements of this Regulation, with the exception of the requirements set out in point 4 of Annex V, if it is specifically designed and marketed for its intended use in at least one of the following applications		N/A
(a)	signalling (including, but not limited to, road-, railway-, marine- or air traffic- signalling, traffic control or airfield lamps)		N/A
(b)	image capture and image projection (including, but not limited to, photocopying, printing (directly or in preprocessing), lithography, film and video projection, holography);		N/A
(c)	Light sources with specific effective ultraviolet power > 2 mW/klm and intended for use in applications requiring high UV-content		N/A
(d)	Light sources with a peak radiation around 253,7 nm and intended for germicidal use (destruction of DNA)		N/A
(e)	light source emitting 5 % or more of total radiation power of the range 250-800 nm in the range of 250-315 nm and/or 20 % or more of total radiation power of the range 250-800 nm		N/A

	in the range of 315-400 nm, and intended for disinfection or fly trapping		
(f)	Light sources having the primary purpose to emit radiation around 185,1 nm and intended to be used for the generation of ozone		N/A
(g)	Light sources emitting 40 % or more of total radiation power of the range 250-800 nm in the range of 400-480 nm, and intended for coral zooxanthellae symbioses		N/A
(h)	FL light sources emitting 80 % or more of total radiation power of the range 250-800 nm in the range of 250-400 nm, and intended for sun-tanning		N/A
(i)	HID light sources emitting 40 % or more of total radiation power of the range 250-800 nm in the range of 250-400 nm, and intended for sun-tanning		N/A
(j)	Light sources with a photosynthetic efficacy > 1,2 µmol/J, and/or emitting 25 % or more of total radiation power of the range 250-800 nm in the range of 700-800 nm, and intended for use in horticulture		N/A
(k)	LED or OLED light sources, complying with the definition of 'original works of art' as defined in Directive 2001/84/EC of the European Parliament and of the Council, made by the artist him/herself in a limited number below 10 pieces		N/A
10.	**Product information (Annex V of EU 2019/2015)**		**P**
10.1	Product information sheet	Optional: Manufacturer can declare based on a draft	P
10.1.1	Pursuant to point 1(b) of Article 3, the supplier shall enter into the product database the information as set out in Annex V, Table 3, including when the light source is a part in a containing product	See attached table 3	P
	For light sources that can be tuned to emit light at full-load with different characteristics, the values of parameters that vary with these characteristics shall be reported at the reference control settings		N/A
	If the light source is no longer placed on the EU market, the supplier shall put in the product database the date (month, year) when the placing on the EU market stopped		P

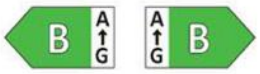
10.2	Information to be displayed in the documentation for a containing product		P
	If a light source is placed on the market as a part in a containing product, the technical documentation for the containing product shall clearly identify the contained light source(s), including the energy efficiency class		P
	If a light source is placed on the market as a part in a containing product, the following text shall be displayed, clearly legible, in the user manual or booklet of instructions:		P
	'This product contains a light source of energy efficiency class <X>'		P
	where <X> shall be replaced by the energy efficiency class of the contained light source		P
	If the product contains more than one light source, the sentence can be in the plural, or repeated per light source, as suitable		N/A
10.3	Information to be displayed on the supplier's free access website	Optional: Manufacturer can declare based on a draft	P
(a)	The reference control settings, and instructions on how they can be implemented, where applicable		N/A
(b)	Instructions on how to remove lighting control parts and/or non-lighting parts, if any, or how to switch them off or minimize their power consumption		P
(c)	If the light source is dimmable: a list of dimmers it is compatible with, and the light source — dimmer compatibility standard(s) it is compliant with, if any		P
(d)	If the light source contains mercury: instructions on how to clean up the debris in case of accidental breakage		N/A
(e)	Recommendations on how to dispose of the light source at the end of its life in line with Directive 2012/19/EU of the European Parliament and of the Council		P
10.4	Information for products specified in point 3 of Annex IV		N/A
	For the light source specified in point 3 of Annex IV, their intended use shall be stated on all forms of packaging, product information and advertisement, together with a clear indication that the light source is not intended for use in		N/A

DRAFT

	other applications		
	The technical documentation file drawn up for the purposes of conformity assessment, in accordance with paragraph 3 of Article 3 of Regulation (EU) 2017/1369 shall list the technical parameters that make the product design specific to qualify for the exemption		N/A
11.	**Technical documentation (Annex VI of EU 2019/2015)**		**P**
11.1	The technical documentation referred to in point 1(d) of Article 3 shall include:	Optional: Manufacturer can declare his intention based on a draft	P
(a)	the name and address of the supplier		P
(b)	supplier's model identifier		P
(c)	the model identifier of all equivalent models already placed on the market		P
(d)	identification and signature of the person empowered to bind the supplier		P
(e)	the declared and measured values for the following technical parameters		P
(1)	useful luminous flux (Φ_{use}) in lm		P
(2)	colour rendering index (CRI)		P
(3)	on-mode power (P_{on}) in W		P
(4)	beam angle in degrees for directional light sources (DLS)		N/A
(5)	correlated colour temperature (CCT) in K for FL and HID light sources		N/A
(6)	standby power (P_{sb}) in W, including when it is zero		N/A
(7)	networked standby power (P_{net}) in W for connected light sources (CLS)		N/A
(8)	displacement factor (cos Φ1) for LED and OLED mains light sources		N/A
(9)	colour consistency in MacAdam ellipse steps for LED and OLED light sources		P
(10)	luminance-HLLS in cd/mm2 (only for HLLS)		N/A
(11)	flicker metric (P_{st}LM) for LED and OLED light sources		N/A
(12)	stroboscopic effect metric (SVM) for LED and OLED light source		N/A
(13)	excitation purity, only for CTLS, for the		N/A

	following colours and dominant wavelength within the given range		
	Colour Dominant wave-length range		N/A
	Blue 440 nm — 490 nm		N/A
	Green 520 nm — 570 nm		N/A
	Red 610 nm — 670 nm		N/A
(f)	the calculations performed with the parameters, including the determination of the energy efficiency class		P
(g)	references to the harmonised standards applied or other standards used		P
(h)	testing conditions if not described sufficiently in point (g)		P
(i)	the reference control settings, and instructions on how they can be implemented, where applicable		N/A
(j)	instructions on how to remove lighting control parts and/or non-lighting parts, if any, or how to switch them off or minimise their power consumption during light source testing		P
(k)	specific precautions that shall be taken when the model is assembled, installed, maintained or tested		P
12.	**Information to be provided in visual advertisements, in technical promotional material and in distance selling, except distance selling on the internet (Annex VII of EU 2019/2015)**		**P**
12.1	In visual advertisements, for the purposes of ensuring conformity with the requirements laid down in point 1(e) of Article 3 and point 1(c) of Article 4, the energy class and the range of efficiency classes available on the label shall be shown as set out in point 4 of this Annex	Optional: Manufacturer can declare based on a draft	N/A
12.2	In technical promotional material, for the purposes of ensuring conformity with the requirements laid down in point 1(f) of Article 3 and point 1(d) of Article 4, the energy class and the range of efficiency classes available on the label shall be shown as set out in point 4 of this Annex		N/A
12.3	Any paper-based distance selling must show the energy class and the range of efficiency classes available on the label as set out in point 4 of this Annex		N/A
12.4	The energy efficiency class and the range of		N/A

	energy efficiency classes shall be shown, as indicated in Figure 2, with		
(a)	an arrow, containing the letter of the energy efficiency class in 100 % white, Calibri Bold and in a font size at least equivalent to that of the price, when the price is shown		N/A
(b)	the colour of the arrow matching the colour of the energy efficiency class		N/A
(c)	the range of available energy efficiency classes in 100 % black; and		N/A
(d)	the size shall be such that the arrow is clearly visible and legible. The letter in the energy efficiency class arrow shall be positioned in the centre of the rectangular part of the arrow, with a border of 0,5 pt in 100 % black placed around the arrow and the letter of the energy efficiency class By way of derogation, if the visual advertisement, technical promotional material or paper-based distance selling is printed in monochrome, the arrow can be in monochrome in that visual advertisement, technical promotional material or paper-based distance selling *Figure 2* **Coloured/monochrome left/right arrow, with range of energy efficiency classes indicated** 		N/A
12.5	Telemarketing-based distance selling must specifically inform the customer of the energy efficiency class of the product and of the range of energy efficiency classes available on the label, and that the customer can access the full label and the product information sheet through a free access website, or by requesting a printed copy	Optional: Manufacturer can declare based on a draft	N/A
12.6	For all the situations mentioned in points 1 to 3 and 5, it must be possible for the customer to access the label and the product information sheet through a link to the product database website, or to request a printed copy		N/A
13.	**Information to be provided in the case of distance selling on the internet (Annex VIII of EU 2019/2015)**		**N/A**
13.1	The appropriate label made available by suppliers in accordance with point 1(g) Article 3 shall be shown on the display mechanism in	Optional: Manufacturer can declare based on a draft	N/A

	proximity to the price of the product. The size shall be such that the label is clearly visible and legible and shall be proportionate to the size specified for the standard label in Annex III		
	The label may be displayed using a nested display, in which case the image used for accessing the label shall comply with the specifications laid down in point 3 of this Annex. If nested display is applied, the label shall appear on the first mouse click, mouse roll-over or tactile screen expansion on the image		N/A
13.2	The image used for accessing the label in the case of nested display, as indicated in Figure 3, shall		N/A
(a)	be an arrow in the colour corresponding to the energy efficiency class of the product on the label		N/A
(b)	indicate the energy efficiency class of the product on the arrow in 100 % white, Calibri Bold and in a font size equivalent to that of the price		N/A
(c)	have the range of available energy efficiency classes in 100 % black; and		N/A
(d)	have one of the following two formats, and its size shall be such that the arrow is clearly visible and legible. The letter in the energy efficiency class arrow shall be positioned in the centre of the rectangular part of the arrow, with a visible border in 100 % black placed around the arrow and the letter of the energy efficiency class: *Figure 3* Coloured left/right arrow, with range of energy efficiency classes indicated 		N/A
13.3	In the case of nested display, the sequence of display of the label shall be as follows		N/A
(a)	the image referred to in point 2 of this Annex shall be shown on the display mechanism in proximity to the price of the product		N/A
(b)	the image shall link to the label set out in Annex III		N/A
(c)	the label shall be displayed after a mouse click, mouse roll-over or tactile screen expansion on		N/A

	the image		
(d)	the label shall be displayed by pop up, new tab, new page or inset screen display		N/A
(e)	for magnification of the label on tactile screens, the device conventions for tactile magnification shall apply		N/A
(f)	the label shall cease to be displayed by means of a close option or other standard-closing mechanism		N/A
(g)	the alternative text for the graphic, to be displayed upon failure to display the label, shall be the energy efficiency class of the product in a font size equivalent to that of the price		N/A
13.4	The appropriate product information sheet made available by suppliers in accordance with point 1(h) of Article 3 shall be shown on the display mechanism in proximity to the price of the product. The size shall be such that the product information sheet is clearly visible and legible. The product information sheet may be displayed using a nested display or by referring to the product database, in which case the link used for accessing the product information sheet shall clearly and legibly indicate 'Product information sheet'. If nested display is used, the product information sheet shall appear on the first mouse click, mouse roll-over or tactile screen expansion on the link		N/A

DRAFT

For reference:

Annex II, table 1 of EU 2019/2015	**Energy Efficiency Class of light sources**		**P**
	The energy efficiency class of light sources shall be determined as set out in below table, on the basis of the total mains efficacy η_{TM}		P
	Energy efficiency class	Total mains efficacy η_{TM} (lm/W)	P
	A (most efficient)	$210 \leq \eta_{TM}$	N/A
	B	$185 \leq \eta_{TM} < 210$	N/A
	C	$160 \leq \eta_{TM} < 185$	N/A
	D	$135 \leq \eta_{TM} < 160$	N/A
	E	$110 \leq \eta_{TM} < 135$	N/A
	F	$85 \leq \eta_{TM} < 110$	P
	G (least efficient)	$\eta_{TM} < 85$	N/A

DRAFT

Table 2	Data calculation & comparison			
Model No.:	**BALAD2 H25(3500K)**			
Item	**Rated value**	**Measured value**	**Deviation**	**Remark**
Φ_{use} (lm)	170	175.87	3.34%	
P_{on} (W)	1.6	1.59	-0.63%	
η_{TM}	98.39	102.42	3.93%	
Energy efficiency class	F	F		
Ec (kWh/1000h)	2	2		
Remarks: --				

Table 2	Data calculation & comparison			
Model No.:	**BALAD2 H25(5000K)**			
Item	**Rated value**	**Measured value**	**Deviation**	**Remark**
Φ_{use} (lm)	180	181.84	1.01%	
P_{on} (W)	1.6	1.60	0.00%	
η_{TM}	104.18	105.24	1.01%	
Energy efficiency class	F	F		
Ec (kWh/1000h)	2	2		
Remarks: --				

Table 3	Product information sheet		
Supplier's name or trade mark:	EI Dongguan Limited		
Supplier's address:	No.3 Fukang West Road, Honghualin Industrial Zone, Chongkoushequ, Houjie Dongguan, 523947 China		
Model identifier:	BALAD2 H25(3500K)		
Type of light source:	FER067		
Lighting technology used:	LED	Non-directional or directional:	NDLS
Mains or non-mains:	NMLS	Connected light source (CLS):	No
Colour-tuneable light source:	No	Envelope:	No
High luminance light source:	No		

Anti-glare shield:	No	Dimmable:	Yes
Product parameters			
Parameter	Value	Parameter	Value
General product parameters:			
Energy consumption in on-mode (kWh/1000h)	2	Energy efficiency class	F
Useful luminous flux (Φ_{use}), indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°)	170 in a sphere (360°)	Correlated colour temperature, rounded to the nearest 100 K, or the range of correlated colour temperatures, rounded to the nearest 100 K, that can be set	3500
On-mode power (P_{on}), expressed in W	1.6	Standby power (P_{sb}), expressed in W and rounded to the second decimal	-
Networked standby power (P_{net}) for CLS, expressed in W and rounded to the second decimal	-	Colour rendering index, rounded to the nearest integer, or the range of CRI values that can be set	83.5
Outer dimensions without separate control gear, lighting control parts and nonlighting control parts, if any (millimetre) – Height	x	Spectral power distribution in the range 250 nm to 800 nm, at full-load	[graphic]
Outer dimensions without separate control gear, lighting control parts and nonlighting control parts, if any (millimetre) – Width	x		
Outer dimensions without separate control gear, lighting control parts and nonlighting control parts, if any (millimetre) – Depth	x		
Claim of equivalent power	-	If yes, equivalent power (W)	-
		Chromaticity coordinates (x and y)	x=0.404, y=0.388
Parameters for directional light sources:			
Peak luminous intensity (cd)	-	Beam angle in degrees, or the range of beam angles that can be set	-
Parameters for LED and OLED light sources:			
R9 colour rendering index value	11	Survival factor	1.00

DRAFT

the lumen maintenance factor	95.81%		
Parameters for LED and OLED mains light sources:			
displacement factor (cos φ1)	-	Colour consistency in McAdam ellipses	2.5
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage.	-	If yes then replacement claim (W)	-
Flicker metric (Pst LM)	-	Stroboscopic effect metric (SVM)	-

Remark: Only model BALAD2 H25(3500K) for reference.

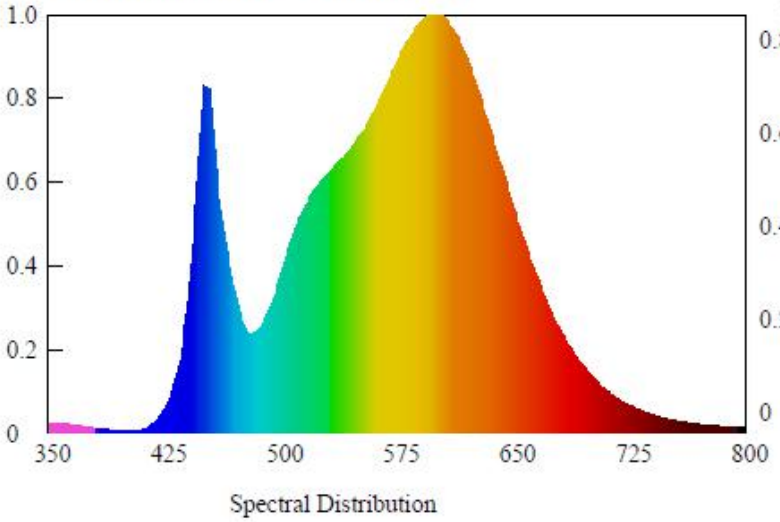
DRAFT

Attachment No. 1: Photometric test record of one lamp at initial measurement

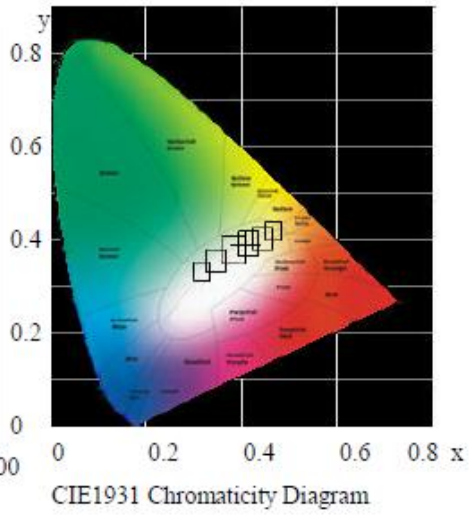
For Model No.: BALAD2 H25(3500K)

Photometric test record of one lamp at initial measurement

Spectroradiometric Parameters



Spectral Distribution



CIE1931 Chromaticity Diagram

Chromaticity Coordinates: x=0.4044 y=0.3877 u'=0.2364 v'=0.5098

Correlated Color Temperature: 3496 K	Dominant Wavelength: 580.0 nm(E)
Colour Fidelity Index: Rf=82	Gamut Index: Rg=95
Luminous Flux: 176.78 lm	Purity: 0.3782
Chromaticity Difference: -0.00114Duv	Peak Wavelength: 600.0 nm
Color Ratio: Kr=41.3% Kg=50.3% Kb=8.4%	Color Tolerance(SDCM): 2.524
Bandwidth: 140.4nm	Radiant Flux: 18.529 W
Photosynthetically Active Radiation(PAR): 17.94W	Photosynthetic Photon Flux(PPF):85.67μmol/s

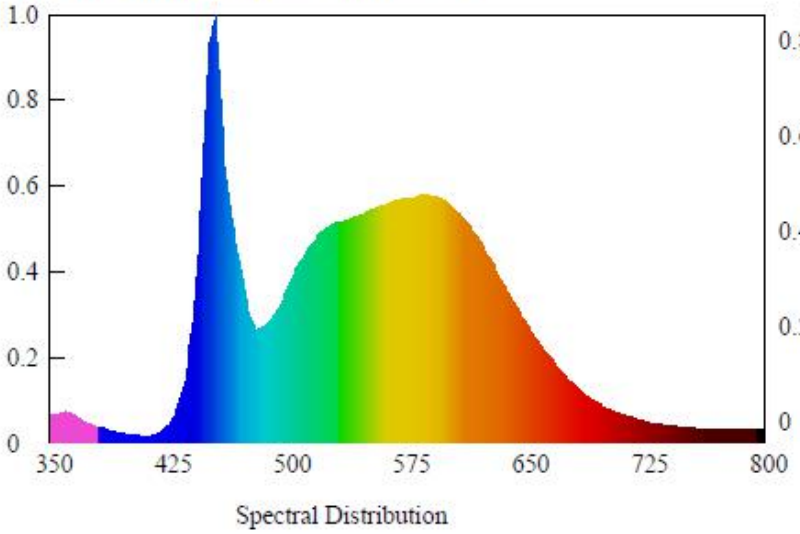
Rendering Index: Ra=83.6

R1=82	R2=91	R3=96	R4=82	R5=82	R6=87	R7=85	R8=63
R9=11	R10=78	R11=81	R12=66	R13=85	R14=98	R15=76	Re=78

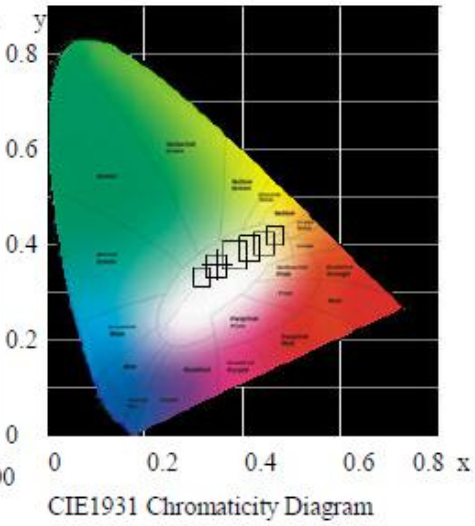
Attachment No. 1: Photometric test record of one lamp at initial measurement
For Model No.: BALAD2 H25(5000K)

Photometric test record of one lamp at initial measurement

Spectroradiometric Parameters



Spectral Distribution



CIE1931 Chromaticity Diagram

Chromaticity Coordinates: x=0.3438 y=0.3565 u'=0.2087 v'=0.4868

Correlated Color Temperature: 5064 K	Dominant Wavelength: 567.0 nm(E)
Colour Fidelity Index: Rf=82	Gamut Index: Rg=94
Luminous Flux: 181.84 lm	Purity: 0.1001
Chromaticity Difference: 0.003Duv	Peak Wavelength: 455.0 nm
Color Ratio: Kr=33.8% Kg=54.5% Kb=11.7%	Color Tolerance(SDCM): 1.3078
Bandwidth: 24.6nm	Radiant Flux: 0.523 W
Photosynthetically Active Radiation(PAR): 0.49W	Photosynthetic Photon Flux(PPF):2.28μmol/s

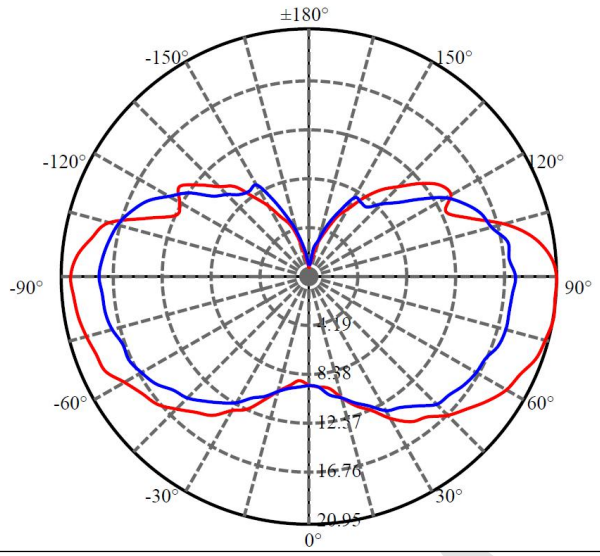
Rendering Index: Ra=84.9

R1=84	R2=91	R3=95	R4=84	R5=83	R6=86	R7=88	R8=69
R9=15	R10=78	R11=83	R12=61	R13=86	R14=97	R15=78	Re=79

Attachment No. 2: Light intensity distribution record of one lamp at initial measurement

Light intensity distribution record of one lamp at initial measurement

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0/C180:

C90/C270:

Field angle(10%Imax):C0/180Left:0.0 Right:0.0
:C90/270Left:0.0 Right:0.0

Beam Angle(50%Imax):C0/180Left:160.3 Right:158.1
:C90/270Left:162.7 Right:160.2

ZONAL FLUX DIAGRAM

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	9.39	N.A.	5.25%
0-40	18.00	N.A.	10.07%
0-60	44.60	N.A.	24.95%
0-90	101.72	N.A.	56.89%
0-120	152.05	N.A.	85.04%
0-180	178.79	N.A.	100.00%
60-90	57.12	N.A.	31.94%
90-120	50.33	N.A.	28.15%
90-130	60.81	N.A.	34.01%
90-150	73.37	N.A.	41.04%
90-180	77.05	N.A.	43.10%
0-113.05	143.04	N.A.	80.00%

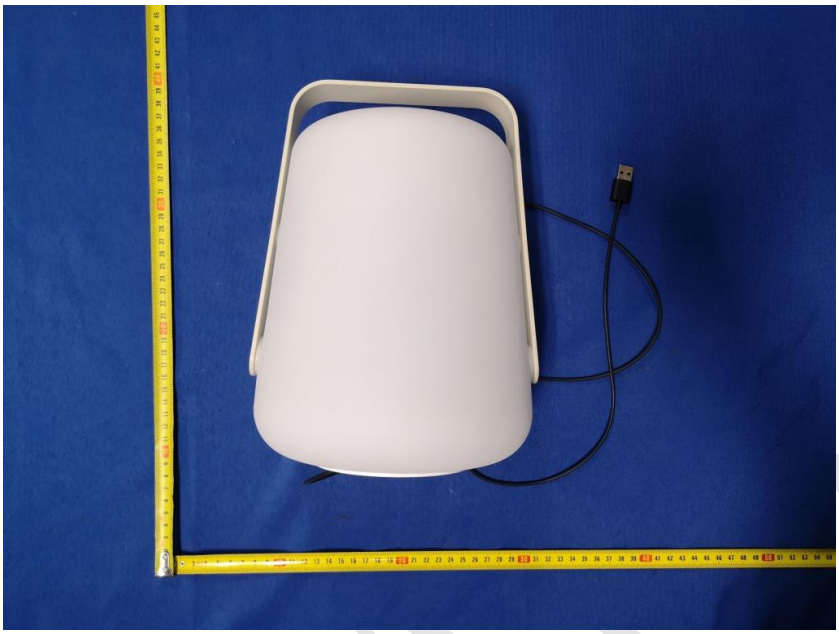
Attachment No. 3: Equipment list.

Equipment	ID No.	Model	Brand/Manufacturer	Calibration due date
Hybrid Recorder	MY41027391	34970A	AGILENT	2026-04-10
Digital Oscilloscope Probe	N/A	G3100	N/A	2026-04-16
Environment Measurer	N/A	8813	Deli	2026-04-16
Hybrid Recorder	MY44095108	34970A	KEYSIGHT	2026-04-10
Thermostatic stabilized photometric sphere	N.A	SENSING	SPR-600M	2026-04-29
Stop watch	N/A	K610	KISLO	2026-04-10
Goniophotometeric System	M101758514120011	GMS-3000	SENSING	2026-04-29
Digital Power Meter	91L929742	YOKOGAWA	WT210	2026-04-28

DRAFT

Attachment No. 4: Photo documentation.

Details of: Outlook of FER067 BALAD2 H25(3500K)



--End of Report---

DRAFT