



LM-79-08 Test Report

For

GREEN CREATIVE LTD

756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

LED commercial downlight

Model: 14CDLA4/835/277V

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

No.1805, DongLiu road, BinJiang District, Hangzhou, China

Tel: +86-571-56680806

www.ledtestlab.com

Report No.: HZ16020003d/R1

This report is replaced the old report No. HZ16020003d dated Mar. 25, 2016

The laboratory that conducted the testing detailed in this report has been accredited for SSL by NVLAP.

Reviewed by:

Engineer: April Zou
Mar. 31, 2016

Approved by:



Manager: Jim Zhang
Mar. 31, 2016

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Test Summary

Sample Tested: **14CDLA4/835/277V**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
83.2	1096.0	13.18	0.9901
CCT (K)	CRI	Stabilization Time (Light & Power)	
3343	82.7	65	

Table 1: Executive Data Summary

Note: The above results are recorded/ derived from measurements made using an Integrating Sphere.

Test specifications:

Date of Receipt	: Mar. 16, 2016
Date of Test	: Mar. 23, 2016
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters, Color Uniformity
Reference Standard	: IESNA LM-79-2008 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products

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Sample Photos



Sample view

Equipment Under Test (EUT)

Name	: LED commercial downlight
Model	: 14CDLA4/835/277V
Electrical Ratings	: 120-277VAC, 60Hz, 14W
Product Description	: 3500K, Non-dimmable, CRI80 Manufacturer of LED light source: Lextar Electronics Corp Model of LED light source: PC35H11
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 25.2°C.

Test orientation was Light down. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 65 minutes, and the total operating time including stabilization was 70 minutes.

Sphere-Spectroradiometer Method

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.111	0.051
Power Factor	0.9901	0.9170
Test Power (W)	13.18	12.96
THD A%	10.43	19.06
Luminous Efficacy (lm/W)	83.2	84.3
Total Luminous Flux (lm)	1096.0	1092.0
Color Rendering Index (CRI)	82.7	
R9	5.3	
Correlated Color Temperature (CCT)(K)	3343	
Chromaticity Chroma x	0.4173	
Chromaticity Chroma y	0.4025	
Chromaticity Chroma u	0.2386	
Chromaticity Chroma v	0.3452	
Duv	0.0019	
Chromaticity Chroma u'	0.2386	
Chromaticity Chroma v'	0.5178	

Special Color Rendering Indices	
R1	80.5
R2	90.1
R3	97
R4	80.8
R5	80.7
R6	87.6
R7	84.5
R8	60.5
R9	5.3
R10	77.3
R11	79.9
R12	67.6
R13	82.8
R14	98.7

Table 2: Test data per Sphere-Spectroradiometer Method

Note: According to CIE 1976 (u',v') diagram, $u' = u = 4x/(-2x+12y+3)$, $v' = 3v/2 = 9y/(-2x+12y+3)$.

Goniophotometer Method

Test ambient temperature was 24.2°C.

The photometric distance is 2.475m.

Luminous data was taken at 0.5°vertical intervals and 10°horizontal intervals.

Parameter	Result
Test Voltage (V)	120.0
Voltage frequency (Hz)	60
Test Current (A)	0.115
Power Factor	0.9916
Test Power (W)	13.67
Luminous Efficacy (lm/W)	83.0
Total Luminous Flux (lm)	1134.8
Beam Angle (°)	96.4
Center Beam Candle Power (cd)	499
Spacing Criteria	1.19(0°-180°)/1.19(90°-270°)
Zonal Lumens in the 0°-60°Zone	86.80%
Zonal Lumens in the 60°-90°Zone	13.13%
Zonal Lumens in the 90°-120°Zone	0.02%
Zonal Lumens in the 120°-180°Zone	0.05%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

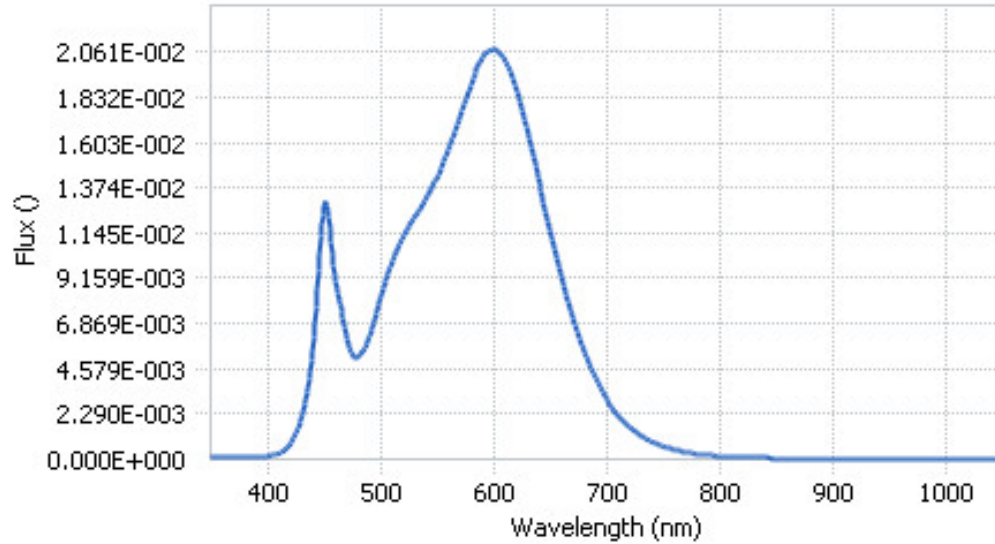
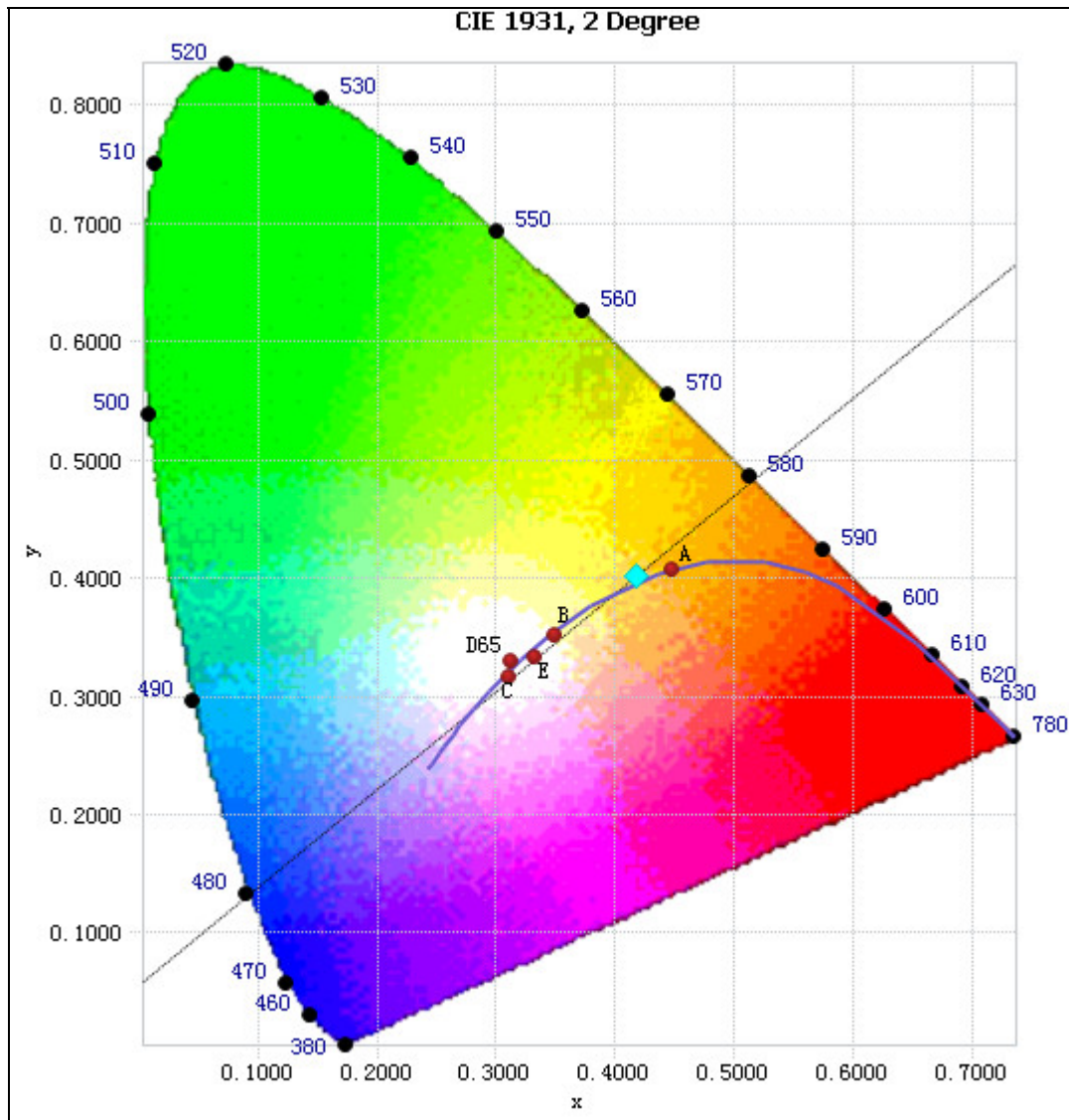


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.41E-04	485	5.50E-03	590	2.03E-02	695	3.50E-03
385	1.22E-04	490	6.19E-03	595	2.06E-02	700	3.00E-03
390	1.37E-04	495	7.17E-03	600	2.08E-02	705	2.56E-03
395	1.41E-04	500	8.20E-03	605	2.05E-02	710	2.19E-03
400	1.50E-04	505	9.20E-03	610	2.02E-02	715	1.89E-03
405	1.91E-04	510	1.00E-02	615	1.96E-02	720	1.62E-03
410	2.69E-04	515	1.08E-02	620	1.87E-02	725	1.38E-03
415	4.33E-04	520	1.13E-02	625	1.77E-02	730	1.18E-03
420	7.20E-04	525	1.18E-02	630	1.65E-02	735	1.00E-03
425	1.23E-03	530	1.22E-02	635	1.53E-02	740	8.54E-04
430	2.04E-03	535	1.26E-02	640	1.40E-02	745	7.28E-04
435	3.32E-03	540	1.32E-02	645	1.28E-02	750	6.21E-04
440	5.49E-03	545	1.37E-02	650	1.15E-02	755	5.32E-04
445	9.52E-03	550	1.43E-02	655	1.03E-02	760	4.61E-04
450	1.29E-02	555	1.50E-02	660	9.20E-03	765	3.97E-04
455	1.16E-02	560	1.58E-02	665	8.10E-03	770	3.36E-04
460	8.99E-03	565	1.66E-02	670	7.11E-03	775	2.89E-04
465	7.66E-03	570	1.74E-02	675	6.21E-03	780	2.51E-04
470	6.32E-03	575	1.83E-02	680	5.41E-03		
475	5.31E-03	580	1.91E-02	685	4.69E-03		
480	5.17E-03	585	1.98E-02	690	4.06E-03		

Table 3: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y) : (0.4173, 0.4025)

Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

Note: The location on the diagram of the tristimulus coordinates are indicated by the blue diamond.

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

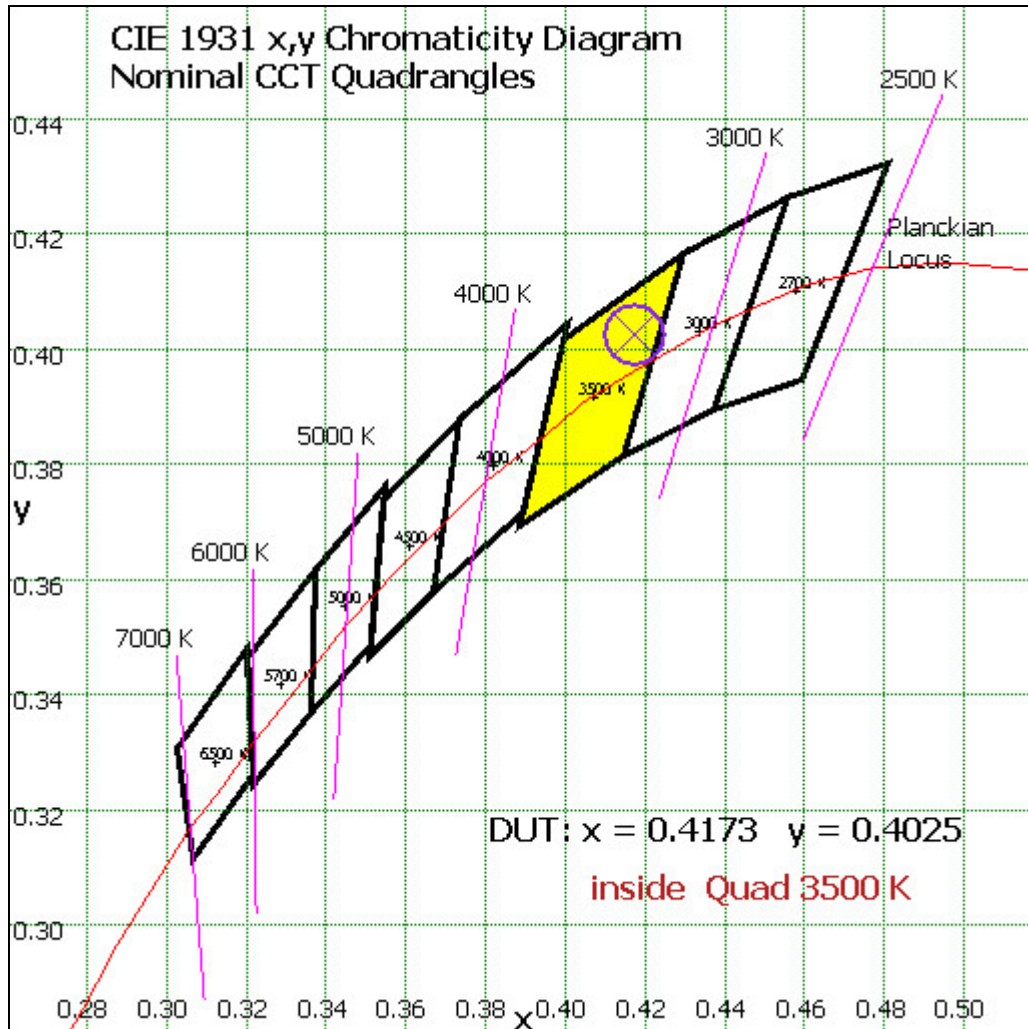


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

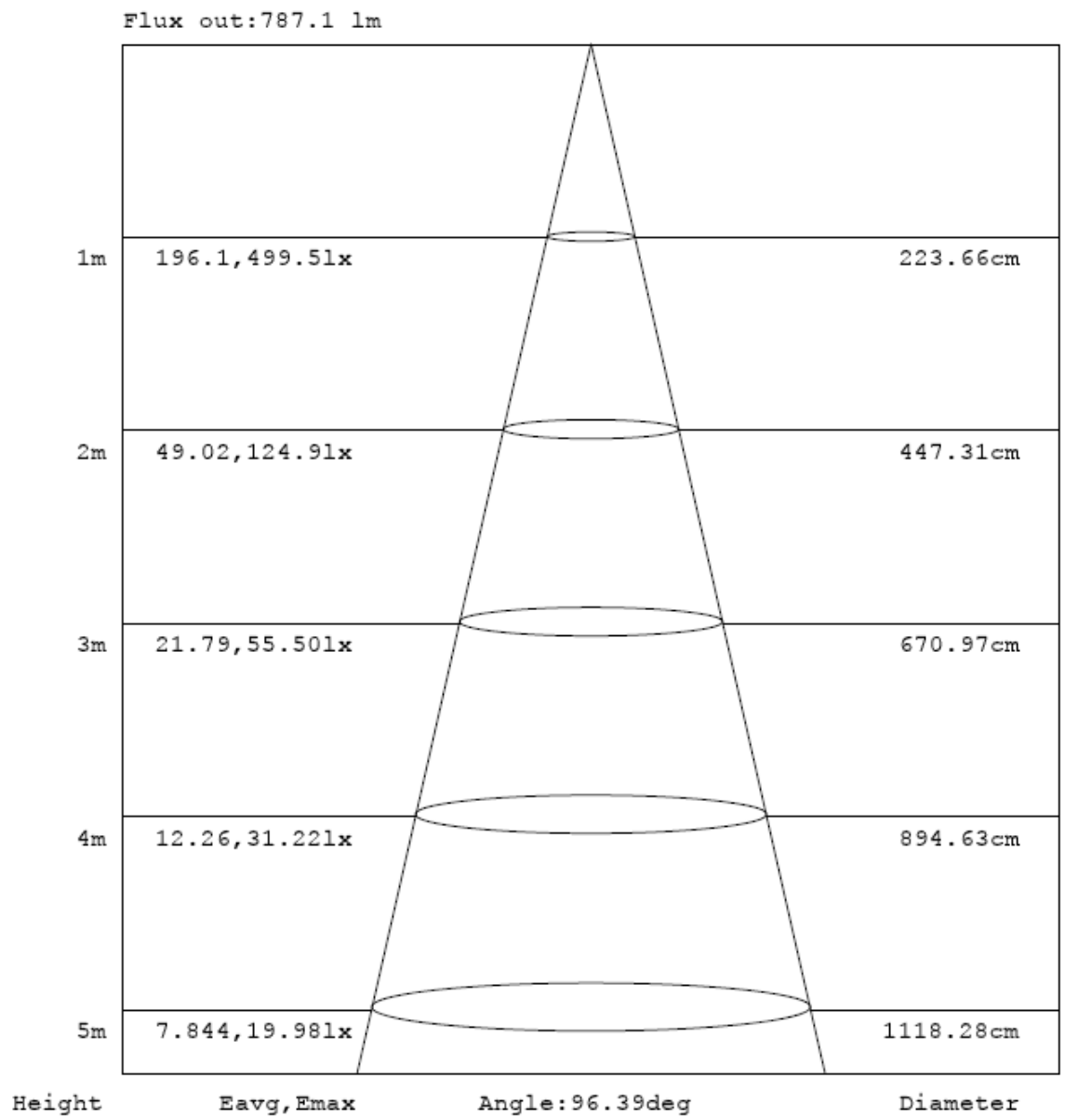
Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	47.119	4.15%
10- 20	133.109	11.73%
20- 30	195.88	17.26%
30- 40	226.091	19.92%
40- 50	214.772	18.93%
50- 60	168.036	14.81%
60- 70	102.416	9.03%
70- 80	38.279	3.37%
80- 90	8.313	0.73%
90-100	0.034	0.00%
100-110	0.056	0.00%
110-120	0.082	0.01%
120-130	0.108	0.01%
130-140	0.139	0.01%
140-150	0.141	0.01%
150-160	0.11	0.01%
160-170	0.07	0.01%
170-180	0.025	0.00%
Total	1134.8	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	985.007	86.80%
60- 90	149.008	13.13%
0-90	1134.015	99.93%
90- 180	0.765	0.07%
0- 180	1134.8	100%

Table 4: Zonal Lumen Data

Illuminance Plots- Goniophotometer Method



Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

Chart 4: Beam Angle

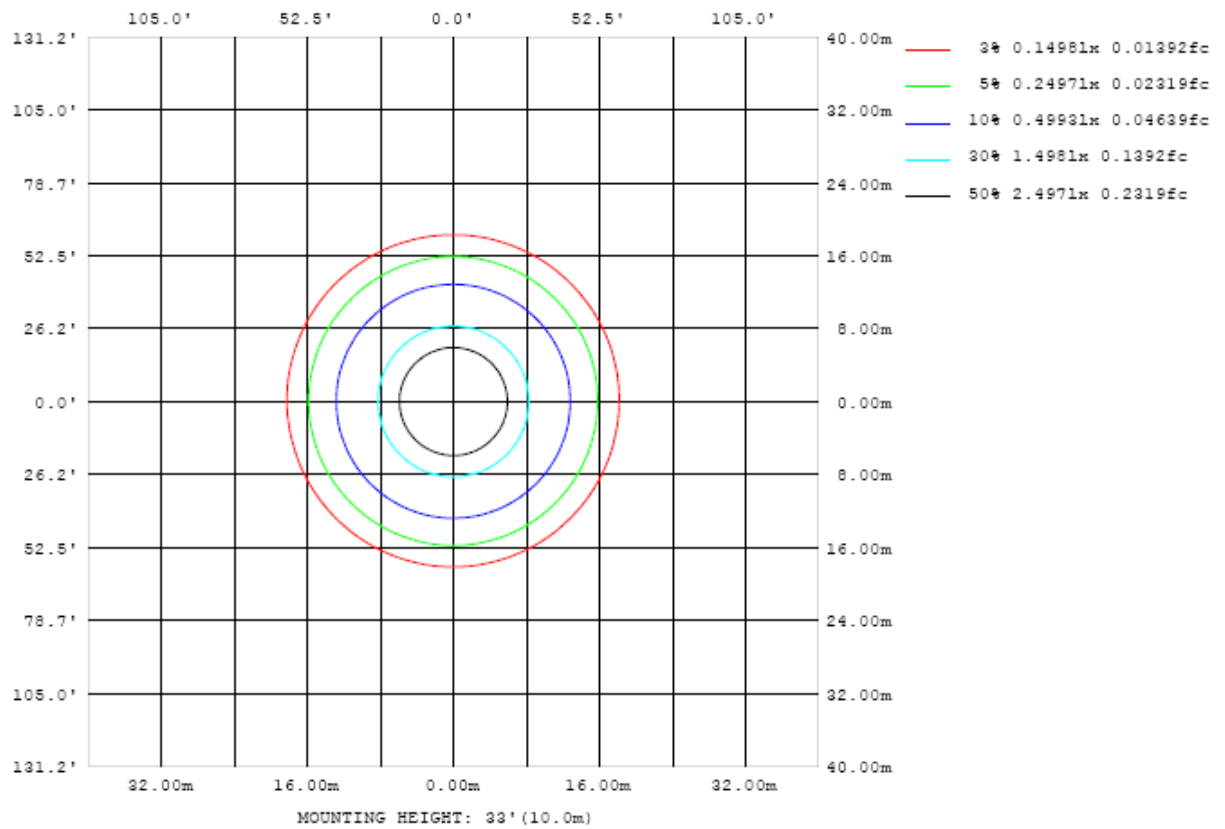


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

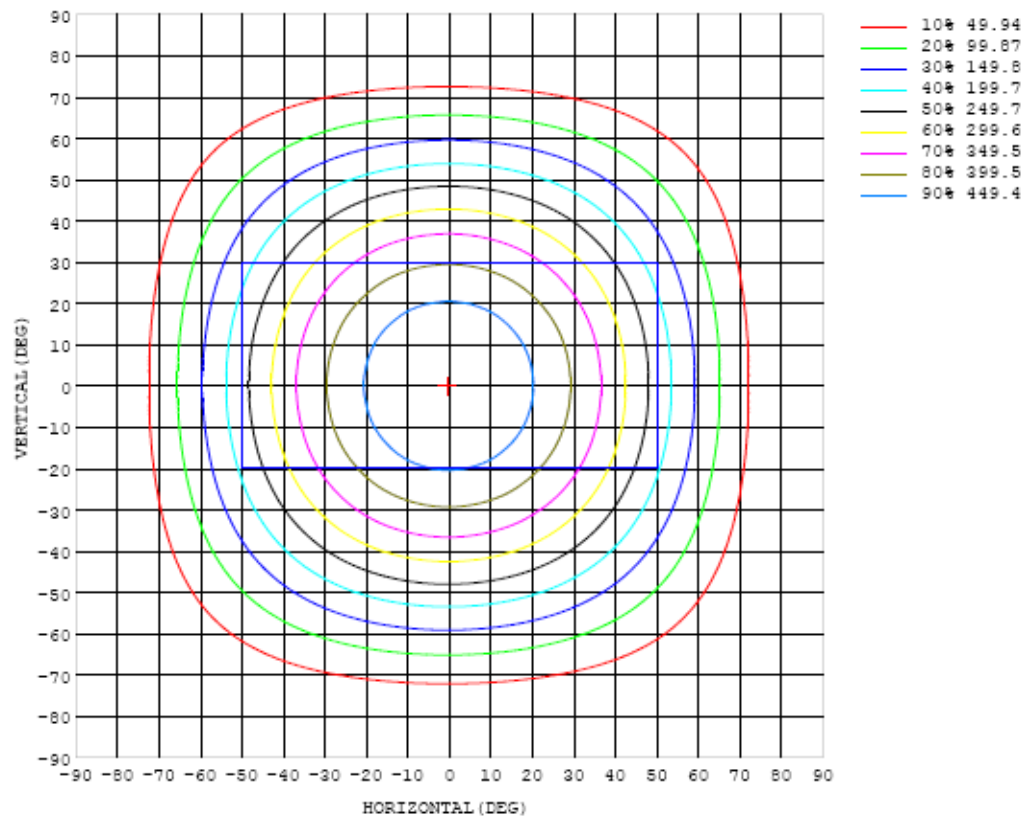


Chart 6: Isocandela Plot

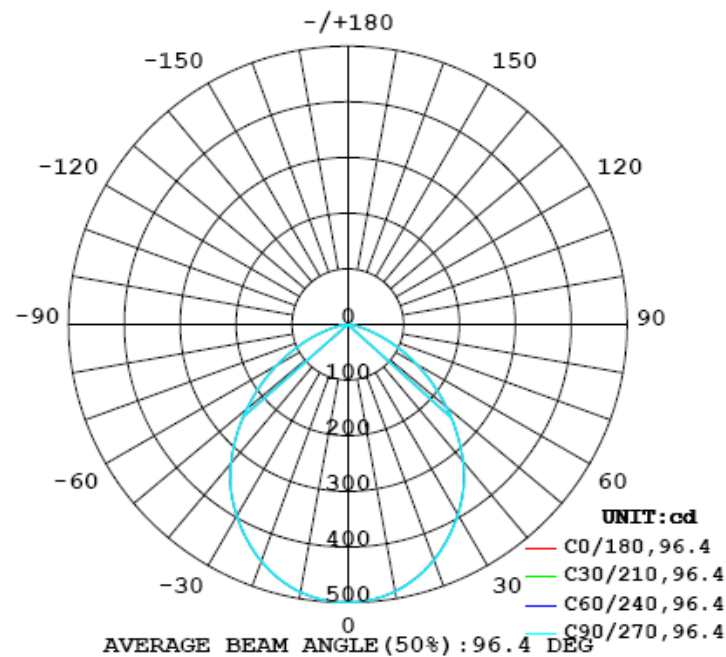


Chart 7: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1

UNIT: cd

C (DEG) y (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	499	499	499	499	499	499	499	499	499	499	499	499	499	499	499	499	499	499	499
5	496	496	496	496	496	496	496	496	496	496	497	497	497	497	497	497	497	497	497
10	487	487	487	487	487	487	487	487	487	488	488	488	488	488	488	488	488	488	488
15	472	471	472	471	472	472	472	472	472	472	472	472	472	473	473	473	473	473	473
20	450	450	450	450	450	450	450	451	451	451	451	451	452	452	452	452	452	452	453
25	424	424	424	424	424	424	424	424	424	425	425	425	426	426	426	426	426	427	427
30	394	394	394	394	394	394	394	394	394	395	395	395	396	396	396	396	397	397	397
35	361	361	361	360	361	361	361	361	361	362	362	362	362	363	363	363	364	364	365
40	321	321	321	320	320	321	321	321	321	321	322	322	322	323	323	324	324	324	325
45	277	276	276	276	276	276	276	276	276	277	277	278	278	278	279	279	280	280	281
50	231	231	231	230	230	230	230	230	231	231	231	232	232	233	233	234	234	234	235
55	186	185	185	185	185	185	185	185	185	186	186	186	187	187	188	188	188	189	190
60	142	142	142	141	141	141	141	141	142	142	142	143	143	143	144	144	145	145	147
65	101	101	101	100	100	100	100	100	100	101	101	101	102	102	102	103	103	104	105
70	63.9	63.6	63.3	63.1	63.0	63.0	63.0	63.1	63.3	63.5	63.7	64.0	64.5	64.3	64.6	65.1	65.7	66.0	67.2
75	33.1	32.9	32.7	32.5	32.4	32.4	32.3	32.4	32.6	32.8	32.9	33.2	33.5	33.8	34.0	34.3	34.6	34.8	35.4
80	16.4	16.3	16.3	16.2	16.1	16.1	16.1	16.0	16.1	16.1	16.1	16.1	16.2	16.2	16.2	16.3	16.3	16.3	16.4
85	7.16	7.07	7.01	6.95	6.88	6.86	6.82	6.83	6.83	6.86	6.91	6.96	7.06	7.13	7.25	7.36	7.45	7.57	7.83
90	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04
95	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.04
100	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.05
105	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.07
110	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08
115	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.10
120	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.12
125	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.14
130	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.17
135	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.21
140	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.24
145	0.18	0.18	0.19	0.19	0.18	0.19	0.19	0.18	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.27
150	0.18	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.18	0.19	0.18	0.18	0.19	0.18	0.18	0.19	0.28
155	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.18	0.19	0.19	0.28
160	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.28
165	0.21	0.21	0.22	0.22	0.22	0.22	0.21	0.22	0.22	0.21	0.21	0.22	0.21	0.21	0.22	0.21	0.21	0.21	0.28
170	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.28
175	0.26	0.26	0.27	0.27	0.26	0.27	0.26	0.27	0.27	0.27	0.27	0.27	0.26	0.26	0.27	0.26	0.26	0.27	0.28
180	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27

Table 6: Luminous Intensity Data

Table--2

UNIT: cd

C (DEG) y (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	499	499	499	499	499	499	499	499	499	499	499	499	499	499	499	499	499		
5	497	497	497	497	497	497	497	497	497	497	497	497	496	496	496	496	496		
10	489	489	489	488	488	488	488	488	488	488	488	488	488	487	487	487	487		
15	474	474	474	473	474	473	473	473	473	473	473	473	472	472	472	472	472		
20	453	453	453	453	453	453	452	452	452	452	452	451	451	451	451	451	450		
25	427	427	427	427	427	427	427	426	426	426	426	426	425	425	425	424	425		
30	398	398	398	398	398	397	397	397	397	396	396	396	395	395	395	395	394		
35	365	365	365	365	365	365	364	364	364	363	363	362	362	362	361	362	361		
40	326	326	326	326	326	326	325	325	325	324	324	323	323	323	322	322	322		
45	282	282	282	282	282	282	281	281	281	280	280	279	279	279	278	278	278		
50	236	236	236	236	236	236	236	236	235	235	235	234	234	233	233	232	232		
55	190	191	191	191	191	191	191	190	190	190	190	189	189	188	188	187	187		
60	147	147	147	147	148	147	147	147	147	147	146	146	146	145	145	144	144		
65	106	106	106	106	106	106	106	106	105	105	105	105	104	104	103	103	103		
70	67.4	67.7	67.8	68.0	67.9	67.9	67.8	67.6	67.5	67.2	67.0	66.7	66.4	66.0	65.6	65.2	64.9		
75	35.6	35.8	35.9	36.0	36.0	36.0	35.9	35.8	35.7	35.5	35.3	35.1	34.8	34.5	34.2	34.0	33.7		
80	16.5	16.5	16.6	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.6	16.6	16.5	16.5		
85	7.92	8.04	8.07	8.14	8.20	8.20	8.19	8.17	8.14	8.07	8.01	7.91	7.83	7.71	7.60	7.51	7.38		
90	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03		
95	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		
100	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		
105	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07		
110	0.08	0.08	0.08	0.08	0.08	0.09	0.08	0.09	0.09	0.08	0.08	0.09	0.08	0.09	0.09	0.09	0.09		
115	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10		
120	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12		
125	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14		
130	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		
135	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21		
140	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.25	0.25	0.25	0.25	0.25	0.25	0.25		
145	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27		
150	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.29	0.29		
155	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29		
160	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.29	0.29	0.29	0.28		
165	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28		
170	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29		
175	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29		
180	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27		

Table 7: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jul. 17, 2015	Jul. 16, 2016
Digital Power Meter	PF2010A	HZTE028-01	Jul. 17, 2015	Jul. 16, 2016
AC Power Supply	PCR 500L	HZTE001-08	Jul. 17, 2015	Jul. 16, 2016
DC Power Supply	WY12010	HZTE004-03	Jul. 17, 2015	Jul. 16, 2016
Temperature Meter	TES1310	HZTE017-01	Jul. 17, 2015	Jul. 16, 2016
Standard source	D908	HZTE012-01	Jul. 23, 2015	Jul. 22, 2016
Integrate Sphere system	2M	HZTE015-01	Jul. 16, 2015	Jul. 15, 2016
Digital Power Meter	WT210	HZTE008-01	Jul. 17, 2015	Jul. 16, 2016
AC Power Supply	PCR 500L	HZTE001-07	Jul. 17, 2015	Jul. 16, 2016
DC Power Supply	6154	HZTE004-04	Jul. 17, 2015	Jul. 16, 2016
Temperature and humidity recorder	JR900	HZTE018-01	Jul. 21, 2015	Jul. 20, 2016
Standard source	SCL-1400	HZTE012-02	Oct. 21, 2015	Oct. 20, 2016

Table 8: Test Equipment List

TEST METHODS

Seasoning of SSL Product

For the purpose of rating new SSL products, SSL products shall be tested with no seasoning. Therefore, no seasoning was performed.

Sphere-Spectroradiometer Method- Photometric and Electrical Measurements

A Labsphere Model CDS 2100 Spectroradiometer and Two Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit. The coating reflectance of each sphere is 98%. The measure geometry is 4π . Self-absorption correction is conducted in testing. Bandwidth of spectroradiometer is 350nm-1050nm.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (small integrated BR30s) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 min, taken 15 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

The standard reference of the integrated sphere system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Standards and Technology.

The uncertainty of integrating sphere system reported in this document is expended uncertainty is 1.39% with a coverage factor $k=2$.

Goniophotometer Method

Photometric and Electrical Measurements

An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.

Ambient temperature was measured at the same height of the sample mounted on the Goniophotometer equipment. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (small integrated BR30s) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 min, taken 15 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Everfine Digital Power Meter.

Some graphics were created with Photometric Plus software.

The standard reference of the Goniophotometer system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Metrology P.R. China.

The uncertainty of goniophotometer system reported in this document is expanded uncertainty is 1.8% with a coverage factor $k=2$.

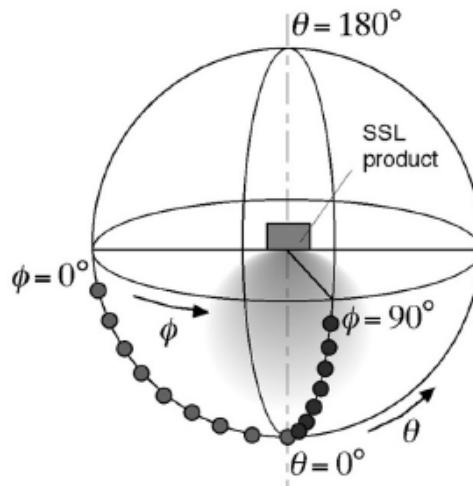
Color Characteristics Measurements

The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as values that are spatially average, weighted to intensity, over the angular range where light is intentionally emitted from the SSL product. The color characteristics measurements are using gonio-spectroradiometer.

Color Spatial Uniformity

The characteristics of SSL products may be spatially non-uniform, the chromaticity coordinate shall be measured at two vertical planes ($C=0^\circ/180^\circ$ and $C=90^\circ/270^\circ$) and at 10° or less intervals for vertical angle until the light output dropped to below 10% of the peak intensity. The averaged weighted chromaticity coordinate was calculated from these points. The data was then analyzed to check for delta color differences of the u' , v' chromaticity coordinates. The spatial non-uniformity of chromaticity, $\Delta u'v'$, is determined as the maximum deviation (distance on the CIE (u' , v') diagram) among all measured points from the spatially averaged chromaticity coordinate.

The geometry for the chromaticity measurement using gonio-spectroradiometer is shown as following.



*** End of Report ***

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