



**TEST REPORT  
IES LM-79-08**

**TÜV SÜD Test Report for  
Electrical and Photometric Measurements of Solid-State Lighting Products**

Report reference No.....	: 68.184.15.293.01
Date of issue.....	: 2015-09-15
Project handler.....	: Levi Guo
Testing laboratory.....	: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Address.....	: Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District 518052 Shenzhen, CHINA
Testing location .....	: Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District 518052 Shenzhen, CHINA
Client.....	: NEKO Lighting AG
Client number .....	: 90185
Address.....	: Flüelastrasse 12, 8048 Zürich, SWITZERLAND
Contact person .....	: SVEN SPEISSEGGER
Standard .....	: This TÜV SÜD test program is based on the following requirements: IES LM-79-08
TRF originated by.....	: TÜV SÜD Product Service GmbH, Mr. Kenneth Lau
Copyright blank test report.....	: This test report is based on the content of the standard (see above). The test report considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by TÜV SÜD Product Service GmbH.  TUV SUD 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.
Test procedure .....	: <input type="checkbox"/> TÜV Mark <input checked="" type="checkbox"/> without certification
Non-standard test method .....	: N/A
National deviations .....	: N/A
Number of pages (Report) .....	: 12
Number of pages (Attachments).....	: 2
Compiled by..... (+ signature)	: Levi Guo  
Approved by..... (+ signature)	: Daniel Chen  

Test sample..... : LED Downlight	
Type of test object ..... : LED Downlight	
Trade mark..... : <b>NEKO</b>	
Model and/or type reference..... : EF205H-52W-840	
Rating(s)..... : 220-240V~; 50/60HZ; 56W	
Manufacturer ..... : NEKO LIGHTING LTD	
Manufacturer number ..... : 90243	
Address ..... : SenYang High-Tech Park, GuangMing high-tech Area, West Zone, GuangMing District, 518132 Shenzhen, PEOPLE'S REPUBLIC OF CHINA	
Contact person..... : Stone Shaw	
Sub-contractors/ tests (clause)..... : N/A	
Name..... : N/A	
Order description .....	<input checked="" type="checkbox"/> Complete test according to TRF
	<input type="checkbox"/> Partial test according to manufacturer's specifications
	<input type="checkbox"/> Preliminary test
	<input type="checkbox"/> Spot check
	<input type="checkbox"/> Other:
Date of order ..... : 2015-09-06	
Date of receipt of test item..... : 2015-09-06	
Date(s) of performance of test..... : 2015-09-06 to 2015-09-15	
Test item particulars (declared):	
Lamp type :	<input type="checkbox"/> Bare lamp <input type="checkbox"/> Covered lamp, no reflector <input type="checkbox"/> Lamp with reflector <input checked="" type="checkbox"/> other: LED Downlight
Lamp cap installed :	--
Rated Voltage:	220-240V~; 50/60Hz
Rated Power:	56W
Rated Power Factor :	> 0.9
Rated Luminous Flux :	4600lm
Rated CCT :	4000K
Rated CRI :	83
Attachments:	
<ol style="list-style-type: none"> <li>1. Test Equipment List</li> <li>2. Lighting Facts Uniform Reporting Template</li> </ol>	

**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 point is used as the decimal separator.

The test results presented in this report relate only to the object tested.

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Measurement uncertainty budgets have been determined for applicable test methods and are available

TUV SUD Cert & Testing (China) Co., Ltd. Shenzhen Branch is an accredited Test Laboratory (NVLAP Lab Code: 500067-0) to IESNA LM-79-08 by NVLAP (National Voluntary Laboratory Accreditation Program).



NVLAP LAB CODE 500067-0

The report must not be used by the client to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

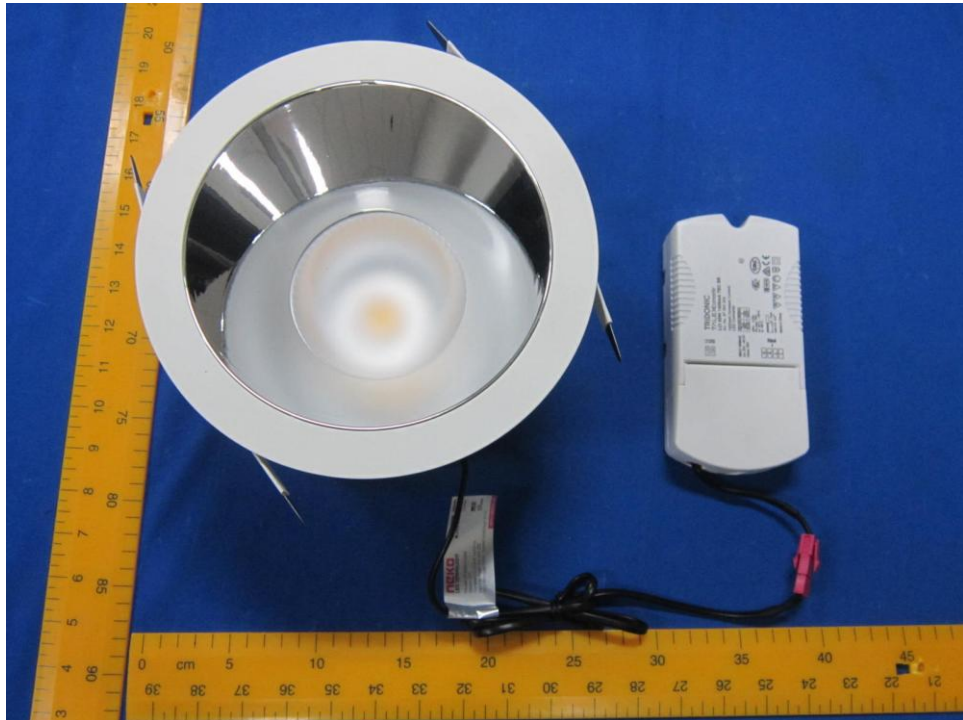
**Summary of testing:**

Model:	EF205H-52W-840
Luminous Efficacy (Lumens/Watt)	95.8
Luminous Flux (Lumens)	5194
Input Power (Watts)	54.2
Power Factor	0.9555
CCT (K)	4048
CRI	81.9
Stabilisation Time (Light Power) (minutes)	90
ISTMT (In-Situ Temp Test) (°C)	--

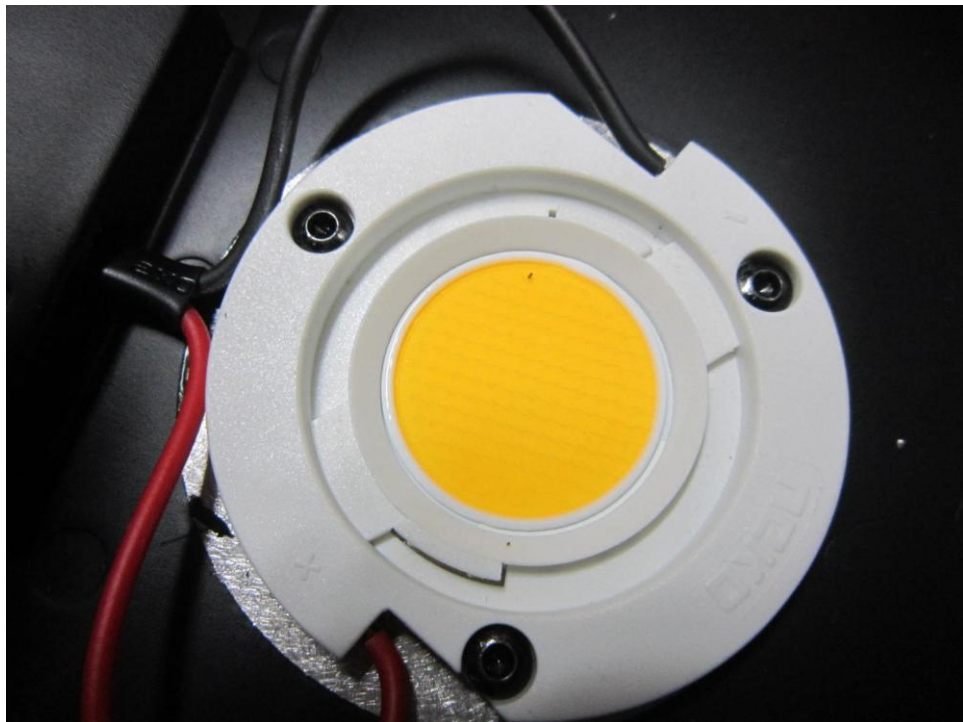
**LED specification:**

Model:	Manufactory	Vf (V)	If (mA)	Viewing angle (°)	CCT(K)	Ra
CLU046-1212C1-403M2G2	CITIZEN	31.8~37.5	1080	--	4000	80

Picture of the product



1. Overview



2. LED view

Copy of marking plate: --
Characteristic data --
Purpose of the product LED Downlight for general lighting purpose.
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) Possible suffixes to the verdicts: - suffix for detailed information for the client.....: - C(comment) - suffix for important information for factory inspection...: - M(manufacturing)

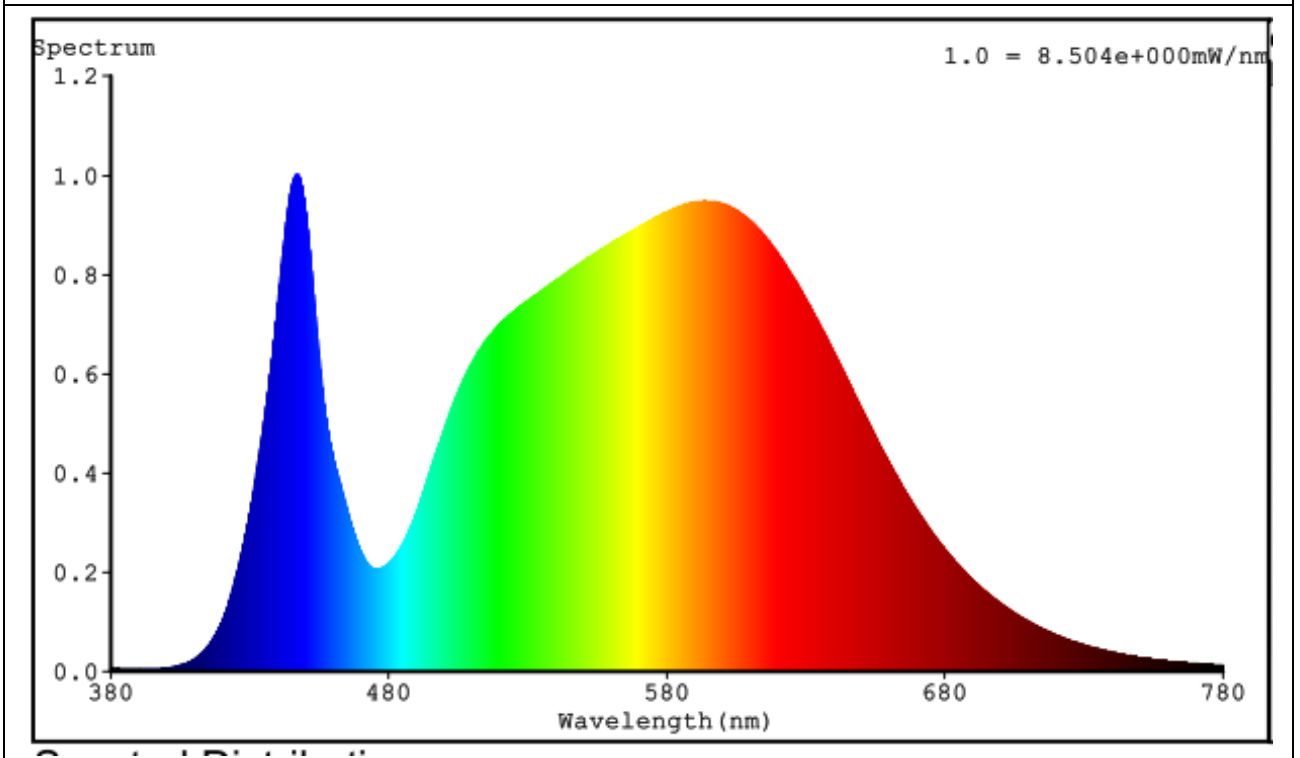
IES LM-79-08			
Clause	Requirement – Test	Measuring result – Remark	Verdict
1.0	Introduction		--
2.0	Ambient Conditions		P
2.1	General		P
2.2	Air Temperature		P
2.3	Thermal Condition for Mounting SSL Products		P
2.4	Air Movement		P
3.0	Power Supply Characteristics		P
3.1	Wave shape of AC power supply		P
3.2	Voltage regulation		P
4.0	Seasoning of SSL Product	No seasoning of SSL product	N/A
5.0	Stabilization of SSL Product		P
	SSL product has sufficiently stabilized before measurement		P
6.0	Operation Orientation		P
	SSL product shall be stabilized and measured in intended operating orientation	As normal working	P
7.0	Electrical Settings		P
	SSL product shall be operated at rated voltage		P
	SSL product with dimming capability are tested at maximum input power condition		N/A
	SSL product with different modes are measured in all relevant modes		N/A
8.0	Electrical Instrumentations		P
8.1	Circuits		P
8.2	Uncertainties		P
9.0	Test methods for Luminous Flux measurement		P
9.1	Integrating sphere with a spectroradiometer (Sphere-spectroradiometer system)		P
9.2	Integrating sphere with a photometer head (Sphere-photometer system)		N/A
9.3	Goniophotometer		P
10.0	Luminous Intensity Distribution		P
	Reporting acc, to IEC LM-63		P
11.0	Luminous Efficacy		P
	Calculation	See table 1	P
12.0	Test Methods for Colour Characteristics of SSL Products		P
	Measurements	See table 1	P
13.0	Uncertainty statement		N/A
14.0	Test report		--



<b>Table 1</b>		<b>Test data</b>	
<b>Model:</b>	EF205H-52W-840		
Rated Voltage (V):	220-240V~	Rated Power (W):	56
Rated luminous flux (lm):	4600	Ambient temperature 25 ±1 (°C):	25.1
Test item	Measured Value		
	Integrating Sphere		Goniophotometer
<b>Key Photometric Results</b>			
Luminous Efficacy (Lumens/Watt)	--	95.8	
Total Luminous Flux (Lumens)	--	5194	
Correlated Color Temperature (CCT:K)	4048	--	
Color Rendering Index (CRI)	81.9	--	
Chromaticity (Chroma x / Chroma y)	0.3807 / 0.3846	--	
Chromaticity (Chroma u / Chroma v)	--	--	
Chromaticity (Chroma u' / Chroma v')	0.2222 / 0.5050	--	
Duv Value	0.0036	--	
Colour Angular Uniformity (Max,du'v')	--	--	
Stabilization Time (Light and Power)	--	90Minutes	
Total Run Time – (Minutes)	--	150Minutes	
Zonal flux (0-60°)	--	99.7%	
Spacing Criteria (0-180°)	--	--	
Spacing Criteria (90-270°)	--	--	
Spacing Criteria (C/γ)	--	C:15.0° / γ:1.0°	
<b>Electrical Input Results</b>			
Input Power (Watts)	--	54.2	
Input Voltage (Volts AC)	--	230	
Input Current (Amps)	--	0.25	
Input Frequency (Hertz)	--	50	
Power Factor	--	0.9555	
A-THD (Current – Total Harmonic Distortion)	--	6.54%	
<b>Additional Information</b>			
Ambient Temperature (°C):	25.0	25.1	
ISTMT (In-Situ Temperature Measurement) (°C):	--		
Photometric measurement condition	--	--	
Supplementary Information:			
<ul style="list-style-type: none"> <li>- Absorbtion Correction used: Yes</li> <li>- Stabilization was considered reached by: the variation (maximum-minimum) of at least 3 readings of the light output and electrical power over a period of 30 minutes is less than 0,5%.</li> </ul>			

<b>Table 2</b>	<b>Spectral Flux Graph</b>
<b>Model:</b>	EF205H-52W-840

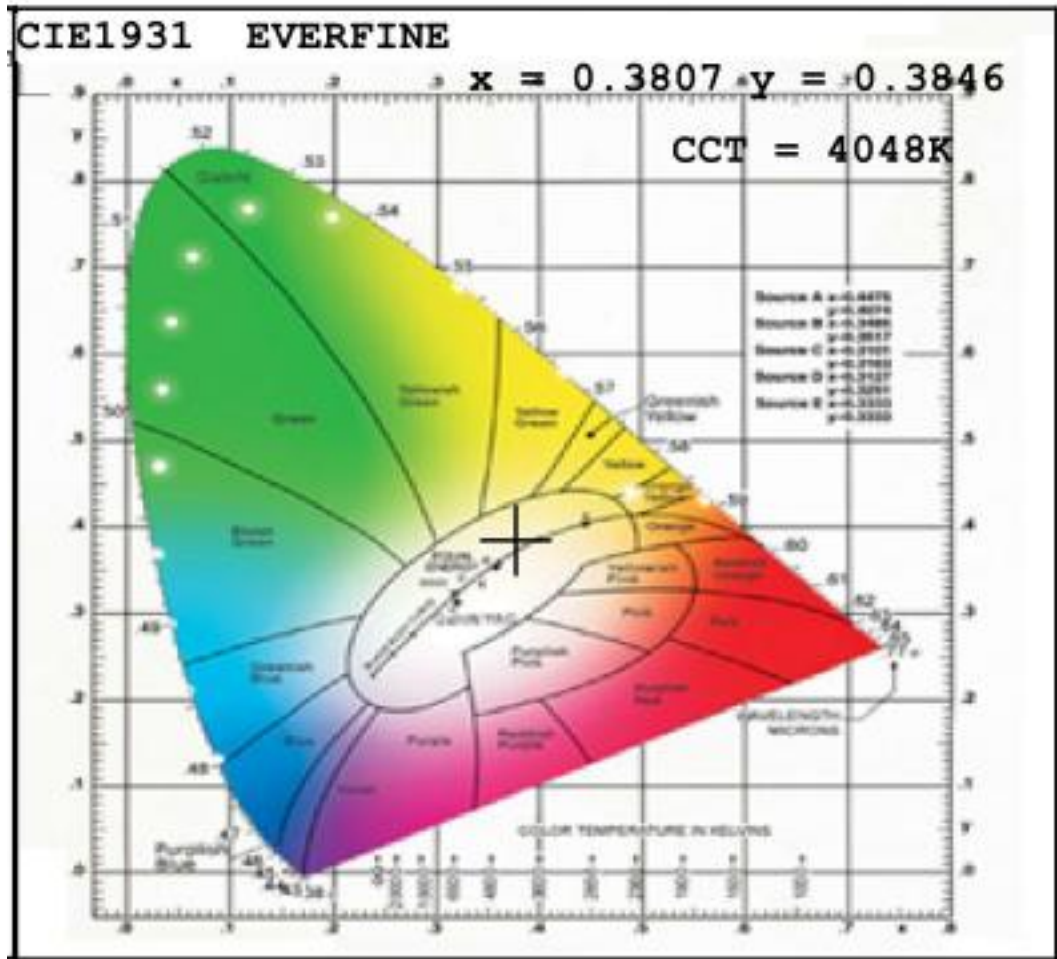
The following graph shows the spectral response curve of the radiant flux for the sample:



**Spectral response of the Radiant Flux**  
(380nm to 780nm – calibrated range of the Spectroradiometer)



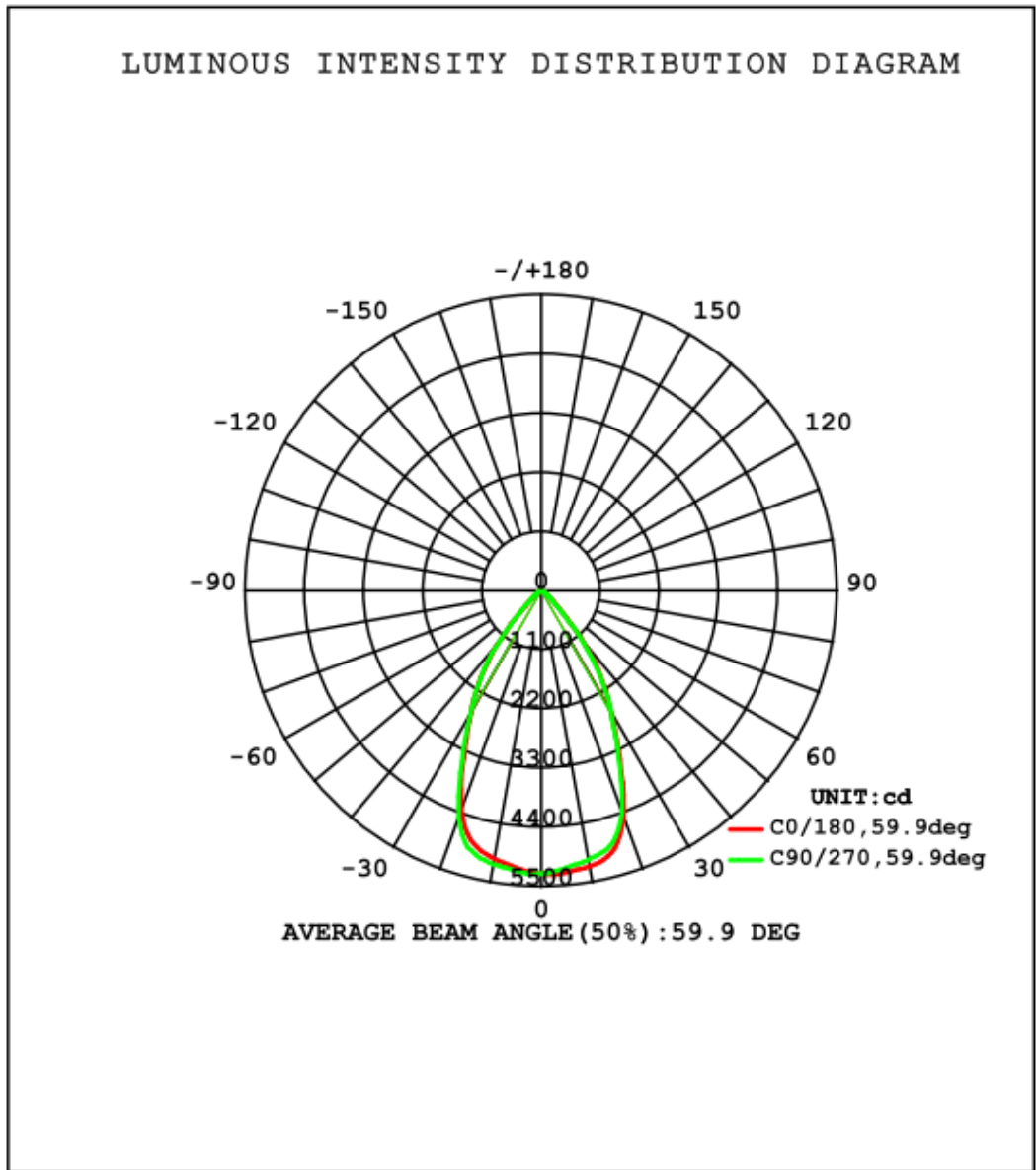
<b>Table 3</b>	<b>Chromaticity Diagram</b>
<b>Model:</b>	Model: EF205H-52W-840



Tristimulus values:  
 $x / y = 0.3807 / 0.3846$   
 Location is indicated by: The black cross

<b>Table 4</b>	<b>Luminous Intensity distribution diagram</b>
<b>Model:</b>	EF205H-52W-840

**Luminous Intensity distribution diagram(Unit: cd)**



<b>Table 5</b>	<b>Planar Illuminance Curve</b>
<b>Model:</b>	EF205H-52W-840

Planar Illuminance Curve (Unit: lx)

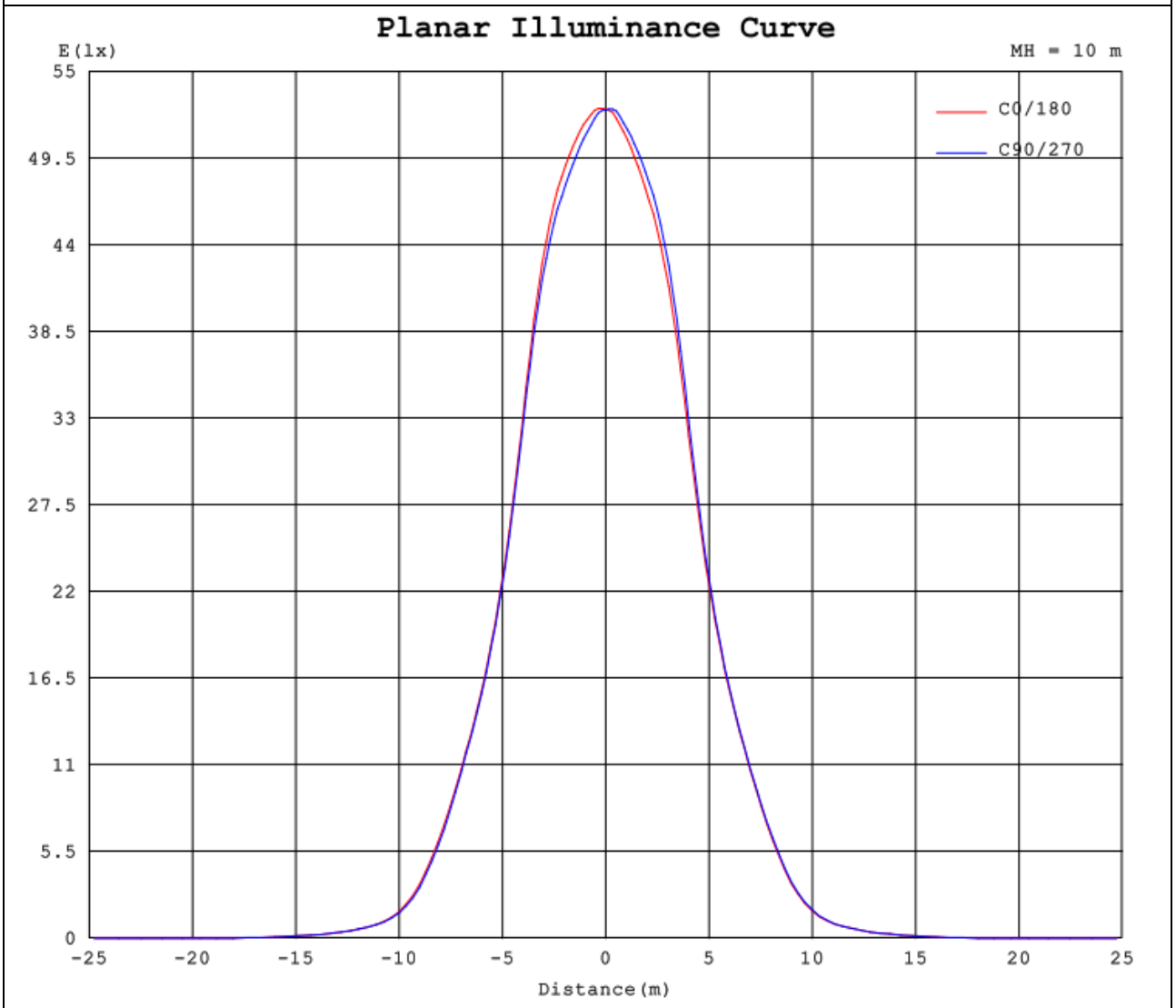


Table 6		Zonal flux diagram										
Model:		EF205H-52W-840										
$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	%lum
10	5203	5144	5079	5040	5060	5102	5164	5195	0- 10	494.6	494.6	9.52
20	4484	4451	4398	4311	4353	4413	4493	4448	10- 20	1377	1872	36
30	2632	2627	2601	2608	2633	2656	2657	2620	20- 30	1586	3457	66.6
40	1153	1122	1100	1118	1163	1196	1191	1155	30- 40	1188	4646	89.4
50	225.7	231.4	222.9	231.9	237.6	240.3	241.8	224.4	40- 50	425.0	5071	97.6
60	37.09	40.71	34.15	42.34	42.73	46.10	42.22	38.27	50- 60	109.4	5180	99.7
70	0.7493	0.6285	0.5188	0.4552	0.3824	0.3773	0.4419	0.6177	60- 70	7.683	5188	99.9
80	0.2559	0.2386	0.2178	0.2065	0.1856	0.1536	0.1697	0.2025	70- 80	0.3607	5188	99.9
90	0.0291	0.0273	0.0317	0.0263	0.0235	0.0223	0.0326	0.0231	80- 90	0.1112	5188	99.9
100	0.0369	0.0345	0.0334	0.0327	0.0522	0.0487	0.0352	0.0486	90-100	0.0325	5188	99.9
110	0.1342	0.1302	0.1218	0.1198	0.1422	0.1144	0.1154	0.1323	100-110	0.0734	5188	99.9
120	0.5840	0.5148	0.4926	0.5001	0.3665	0.3524	0.3256	0.3380	110-120	0.2422	5189	99.9
130	1.466	1.321	1.354	1.299	0.7263	0.7081	0.6434	0.6768	120-130	0.6089	5189	99.9
140	2.754	2.645	2.722	2.636	1.258	1.208	0.9375	1.169	130-140	1.121	5190	99.9
150	3.790	3.661	3.831	3.714	1.821	1.845	1.458	1.737	140-150	1.457	5192	100
160	4.018	4.213	4.213	4.371	2.330	2.322	1.951	2.197	150-160	1.376	5193	100
170	3.980	4.013	4.064	4.327	2.538	2.225	2.119	2.202	160-170	0.9270	5194	100
180	2.162	2.440	2.562	2.338	2.161	2.427	2.551	2.324	170-180	0.2730	5194	100
DEG	LUMINOUS INTENSITY:cd								UNIT:lm			

**Attachment 1: Equipment List**

<b>Equipment</b>	<b>ID No.</b>	<b>Model</b>	<b>Brand/Manufacturer</b>	<b>Calibration due date</b>
Digital Power Meter	13217	WT210	YOKOGAWA	2016-08-19
Anemometer	13117	471-1	Dwyer	2016-01-03
Temperature and Humidity meter	13397	SK-L200TH	SATO	2016-01-11
Goniophotometer system	13345	GO-R5000-SML	Everfine	2016-03-11
Integrating sphere test system	13342	CSLMS-7621	Labsphere	2016-03-11

**Attachment 2**

**U,S, Department of Energy**

**Lighting Facts<sup>cm</sup> Uniform LM-79 Reporting Template**



**Laboratory Information**

Name of test lab	TÜV SÜD Certification and Testing (China) Co., Ltd, Shenzhen Branch
Date of test report	2015-09-15
Test report number	68.184.15.293.01
Laboratory contact name	Daniel Chen
Laboratory contact signature*	<i>Daniel Chen</i>

\* By signing this form, the signatory is attesting that the information on the form is correct and the same as on the original, complete test report(s),  
The signatory also attests that all of the results on this form were measured entirely in accordance with IES LM-79-08,

**Product Information**

Manufacturer	NEKO LIGHTING LTD		
Brand name	<b>NEKO</b>		
Model number	EF205H-52W-840		
SKU (if available)	--		
Type of luminaire (for integral lamps, list base type and lamp type)	LED Downlight		
Luminaire aperture (downlights)	17.5	<input type="checkbox"/> in,	<input checked="" type="checkbox"/> cm
Luminaire length	--	<input type="checkbox"/> in,	<input type="checkbox"/> cm
Luminaire width	--	<input type="checkbox"/> in,	<input type="checkbox"/> cm
Number of units (modular products)	--		

**Electrical Measurements**

**Integrating sphere output**

**Goniophotometer output**

Input wattage	--	54.2	W
Input current	--	0.25	A
Input voltage (AC)	--	230	V
Power factor	--	0.9555	
Off-state power	--	--	W

**Photometric Characteristics**

Total initial lumen output	--	5194	lm
Initial luminaire efficacy	--	95.8	lm/W
Correlated color temperature / CCT	4048	--	K
Color rendering index / CRI	81.9	--	
R <sub>9</sub> value	11	--	
Duv	0.0036	--	

**Luminous Intensity Distribution**

**Goniophotometer output**

Centre beam candlepower (if applicable)	--	5284	cd
Beam angle (if applicable)	--	59.9	°
Zonal lumens in the 0°-60° zone	--	99.7	%
Zonal lumens in the 60°-90° zone	--	0.2	%
Zonal lumens in the 90°-120° zone	--	0	%
Zonal lumens in the 120°-180° zone	--	0.1	%

END OF TEST REPORT