



## DesignLights Consortium Test Report

### Reference Standards

UL1598-2008  
ANSI C82.77-10-2014  
IES LM-79-2008

### Prepared For P.Q.L., Inc.

2285 Ward Avenue / Simi Valley, CA 93065

Test Laboratory:  
UL-CCIC Company Limited

Test Laboratory Address:  
No.2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, China

Catalog Number  
HLT1CP4002CUW

Project Number  
4791313211  
Report Number  
4791313211\_7

Test Date  
2023-11-28~2023-11-29

Issue Date  
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Revision Date  
N/A

#### Prepared By

*Elaine Zhao*

Zhao, Elaine

#### Approved By

*Chris Yi*

Chris Yi

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## Test Summary

### DLC Technical Requirements V5.1- issued 2020-02-14

Requirement Category	Test Method	Requirements	Tolerance	Test Result
Minimum Light Output (lm)-Luminaires	IES LM-79-2008	≥10000	-10%	39430.1
Zonal Lumen Requirement 1(20°-50°)	IES LM-79-2008	≥30%	-10%	54.90%
Minimum Luminaire Efficacy (lm/W)-Luminaires	IES LM-79-2008	≥135	-3%	147.42
Allowable CCT (4000K)	IES LM-79-2008/ANSI C78.377-2015	3985±275	N/A	4128
Allowable CCT (5000K)	IES LM-79-2008/ANSI C78.377-2015	5029±283	N/A	5051
Allowable CCT (5000K)	IES LM-79-2008/ANSI C78.377-2015	5029±283	N/A	5028
Allowable CCT (5000K)	IES LM-79-2008/ANSI C78.377-2015	5029±283	N/A	5017
Minimum CRI	IES LM-79-2008/CIE 13.3-1995	≥70	-1	81
Minimum R9	IES LM-79-2008	≥40	-1	-11.0
Minimum Rg	IES LM-79-2008	≥89	-1	92
Minimum Rf	IES LM-79-2008	≥70	-1	82
Rcs,h1	IES LM-79-2008	-18%-23%	-1%	-15%
Unified Glare Rating (UGR)	IES LM-79-2008	≤28	N/A	26.1
Power Factor	ANSI C82.77-10-2014	≥0.9	-0.03	0.9282
Total Harmonic Distortion (A%)	ANSI C82.77-10-2014	≤20%	5%	11.80%
In-Situ Temperature Measurement Test for LED 1 (°C)	UL1598-2008	≤105	N/A	92.3
In-Situ Temperature Measurement Test for Driver 1 (°C)	UL1598-2008	≤90	N/A	67.7
Max Chromaticity Shift (1000-6000h)	N/A	≤0.007	0.0004	0.0032
Minimum Luminaire Warranty (Years)	N/A	≥5	N/A	≥5

### Test List

Sample Received Date: 2023-11-16

Test Item	Test Date	Model Number	Tests Conducted By
Integrating Sphere Test	2023-11-28	HLT1CP4002CUW 400W 4000K	Zhang, Clark
Integrating Sphere Test	2023-11-28	HLT1CP4002CUW 400W 5000K	Zhang, Clark
Integrating Sphere Test	2023-11-28	HLT1CP4002CUW 340W 5000K	Zhang, Clark
Integrating Sphere Test	2023-11-28	HLT1CP4002CUW 270W 5000K	Zhang, Clark
Goniophotometer Test	2023-11-28	HLT1CP4002CUW 400W 4000K	Zhang, Clark
Goniophotometer Test	2023-11-28	HLT1CP4002CUW 400W 5000K	Zhang, Clark
Goniophotometer Test	2023-11-28	HLT1CP4002CUW 340W 4000K	Zhang, Clark
Goniophotometer Test	2023-11-28	HLT1CP4002CUW 340W 5000K	Zhang, Clark
Goniophotometer Test	2023-11-28	HLT1CP4002CUW 270W 4000K	Zhang, Clark
Goniophotometer Test	2023-11-28	HLT1CP4002CUW 270W 5000K	Zhang, Clark
THD and PF Test	2023-11-28	HLT1CP4002CUW 400W 4000K	Zhang, Clark
THD and PF Test	2023-11-28	HLT1CP4002CUW 400W 5000K	Zhang, Clark

THD and PF Test	2023-11-28	HLT1CP4002CUW 340W 5000K	Zhang, Clark
THD and PF Test	2023-11-28	HLT1CP4002CUW 270W 5000K	Zhang, Clark
In-Situ Temperature Measurement Test	2023-11-29	HLT1CP4002CUW 400W 5000K	Zhang, Clark

**Remark (if any)**

1. UL test equipment information is recorded on Meter Use in UL’s Aurora database.
2. The accuracy method decision rule is applied when the compliance or verdict is made to the results of this report.
3. This Report is a copy report of Test report number 4791059336\_5 issued on 2023-12-04.

**Product Description**

**Lamp/Luminaire Description:** High-bay Luminaires for Commercial and Industrial Buildings

**Model Number:** HLT1CP4002CUW

**Electrical Parameter:** 120-277V, 50/60Hz

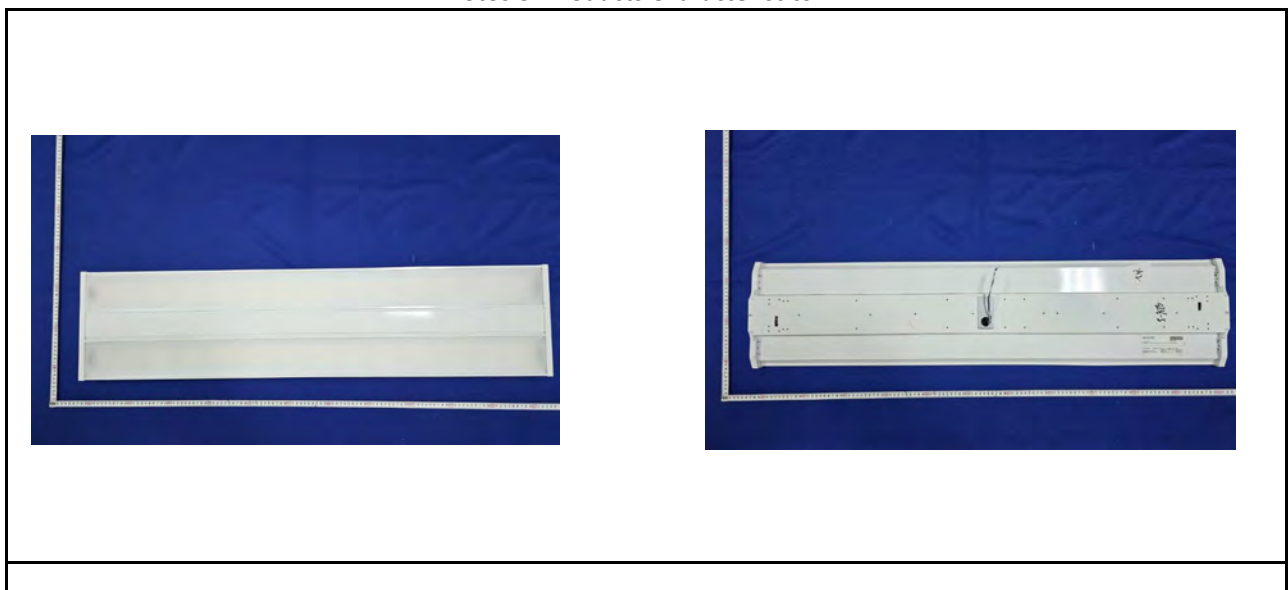
**LED Package:** STW8A32E-HX

**Dimming Information:** Continuous dimming capability

**Products Scaled Value**

Model Number	CCT	Luminous Flux	Power	Luminous Efficacy
HLT1CP4002CUW	4000K	60000	400	150
HLT1CP4002CUW	5000K	60400	400	151
HLT1CP4002CUW	4000K	51680	340	152
HLT1CP4002CUW	5000K	52020	340	153
HLT1CP4002CUW	4000K	41580	270	154
HLT1CP4002CUW	5000K	41850	270	155

**Photos of Products Characteristics**



### Integrating Sphere Test

<b>Model No.</b>	HLT1CP4002CUW 400W 4000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.

2.Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.

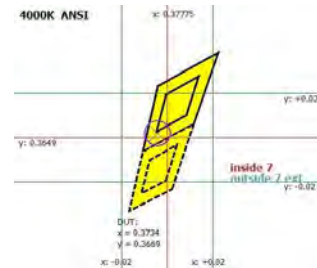
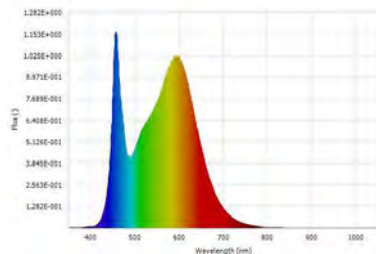
3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

#### Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.08	60	3.1890	382.35	0.9985	Horizontal

#### Test Results

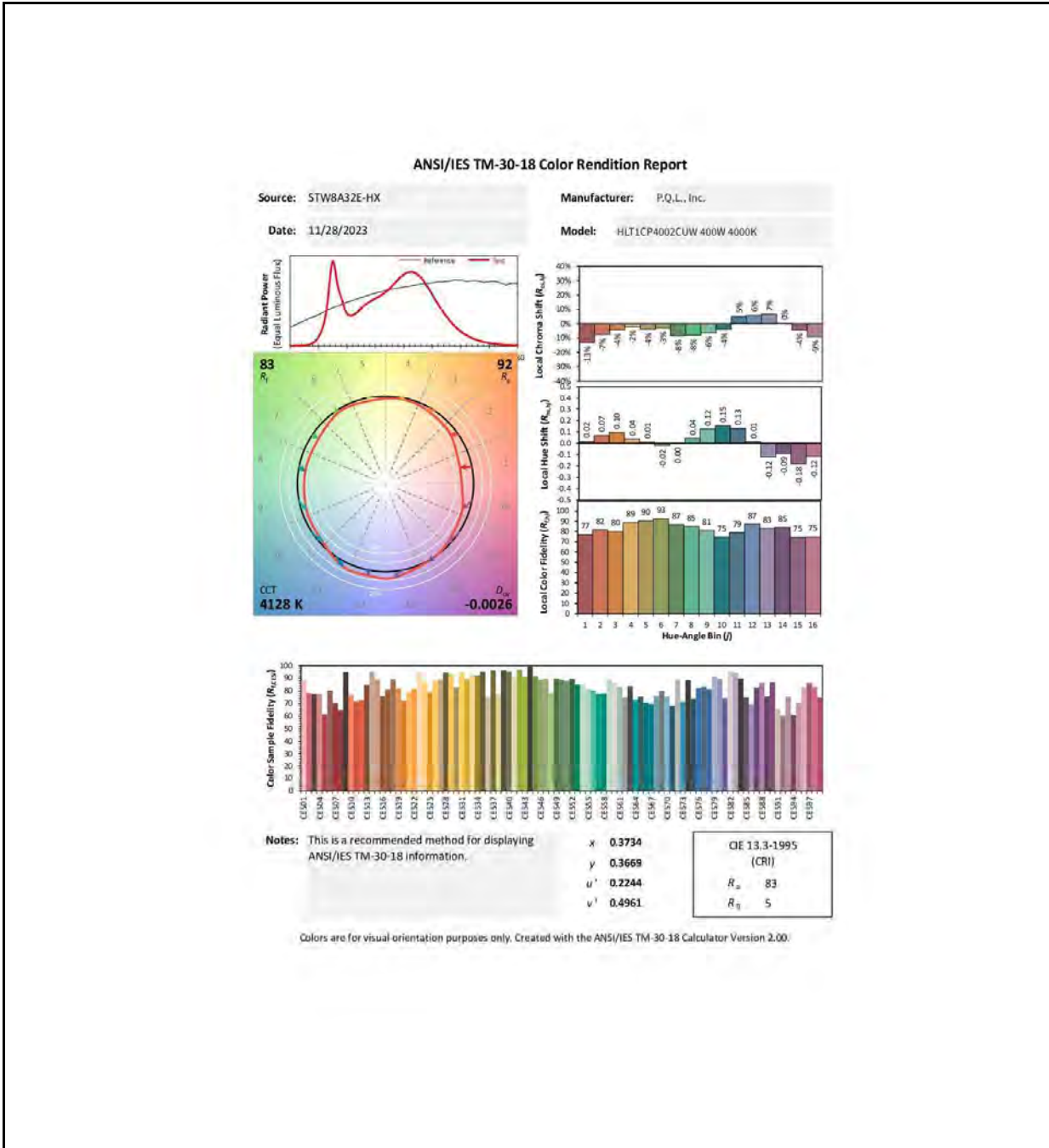
CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
4128	83	5.0	-0.0026	56700	148.29	N/A



Luminous Flux (lm)	56700	Chrom x	0.3734
Chrom y	0.3669	Chrom u	0.2244
Chrom v	0.3307	Duv	-0.0026
Chrom u'	0.2244	Chrom v'	0.4961
CCT (K)	4128	Luminous Efficacy (lm/W)	148.29
Ra	83	R1	82.0
R2	94.0	R3	93.0
R4	78.0	R5	82.0
R6	89.0	R7	82.0
R8	61.0	R9	5.0
R10	84.0	R11	77.0
R12	65.0	R13	86.0
R14	97.0	R15	76.0
Rf	83	Rg	92
Rcs,h1	-13%		

# Integrating Sphere Test (Cont'd)

## TM-30 Report



### Integrating Sphere Test

<b>Model No.</b>	HLT1CP4002CUW 400W 5000K	<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

#### Test Method

1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.

2.Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.

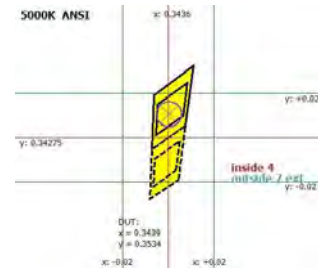
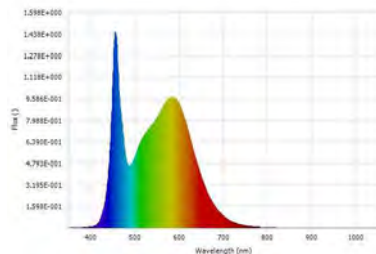
3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

#### Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.04	60	3.2578	390.5	0.9985	Horizontal

#### Test Results

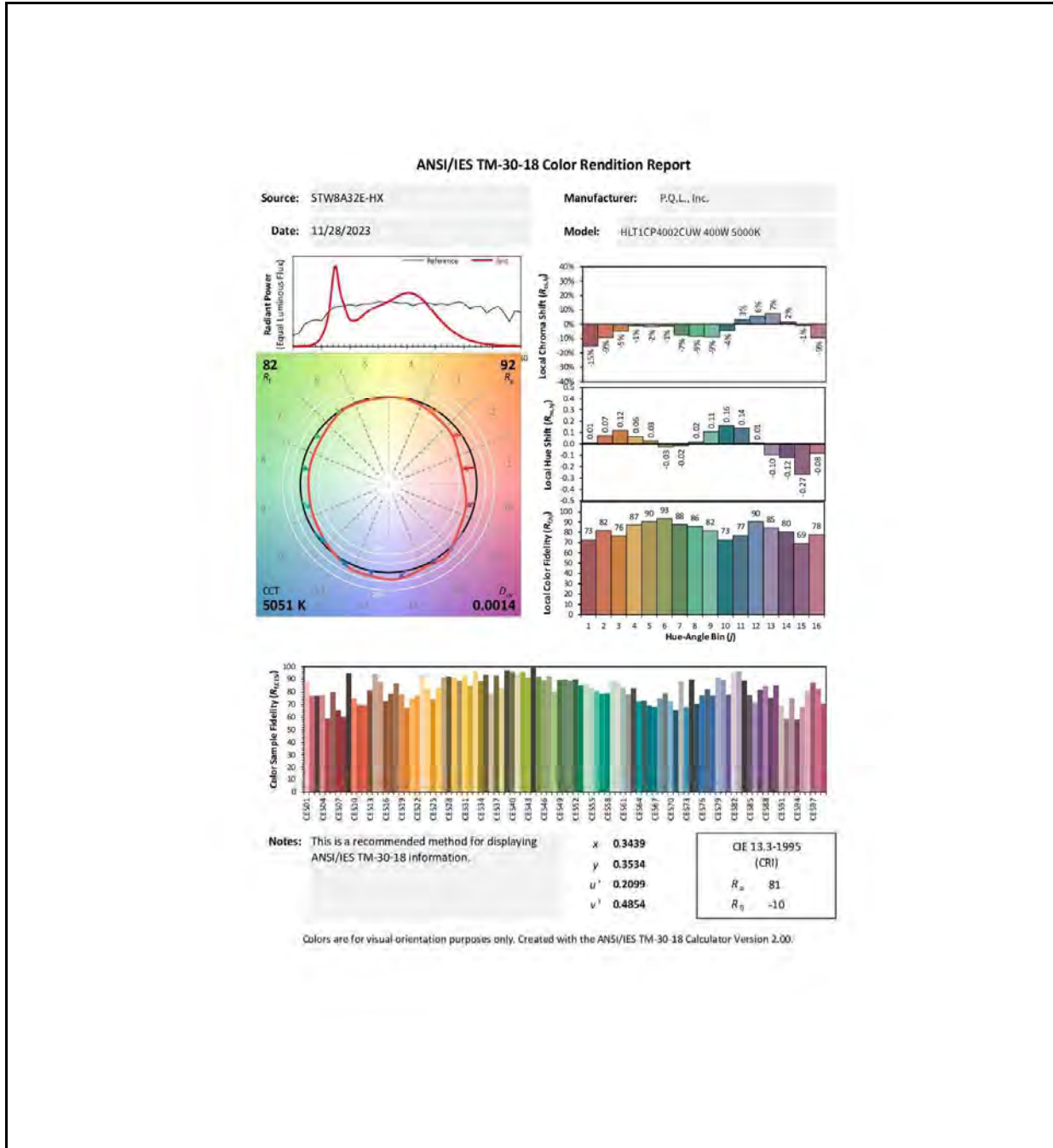
CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
5051	81	-10.0	0.0014	57730.4	147.84	N/A



Luminous Flux (lm)	57730.4	Chrom x	0.3439
Chrom y	0.3534	Chrom u	0.2099
Chrom v	0.3236	Duv	0.0014
Chrom u'	0.2099	Chrom v'	0.4854
CCT (K)	5051	Luminous Efficacy (lm/W)	147.84
Ra	81	R1	79.0
R2	90.0	R3	94.0
R4	77.0	R5	80.0
R6	85.0	R7	83.0
R8	59.0	R9	-10.0
R10	76.0	R11	76.0
R12	63.0	R13	82.0
R14	97.0	R15	72.0
Rf	82	Rg	92
Rcs,h1	-15%		

# Integrating Sphere Test (Cont'd)

## TM-30 Report



### Integrating Sphere Test

<b>Model No.</b>	HLT1CP4002CUW 340W 5000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

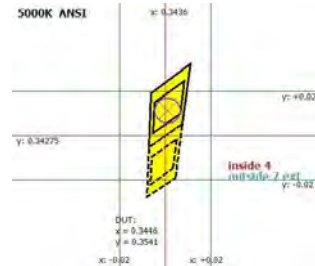
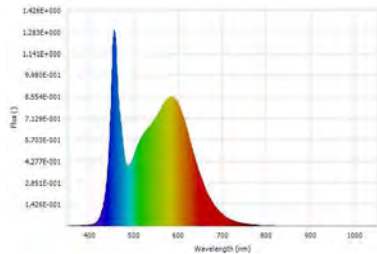
1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.  
 2.Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.  
 3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

#### Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120	60	2.7604	330.61	0.9981	Horizontal

#### Test Results

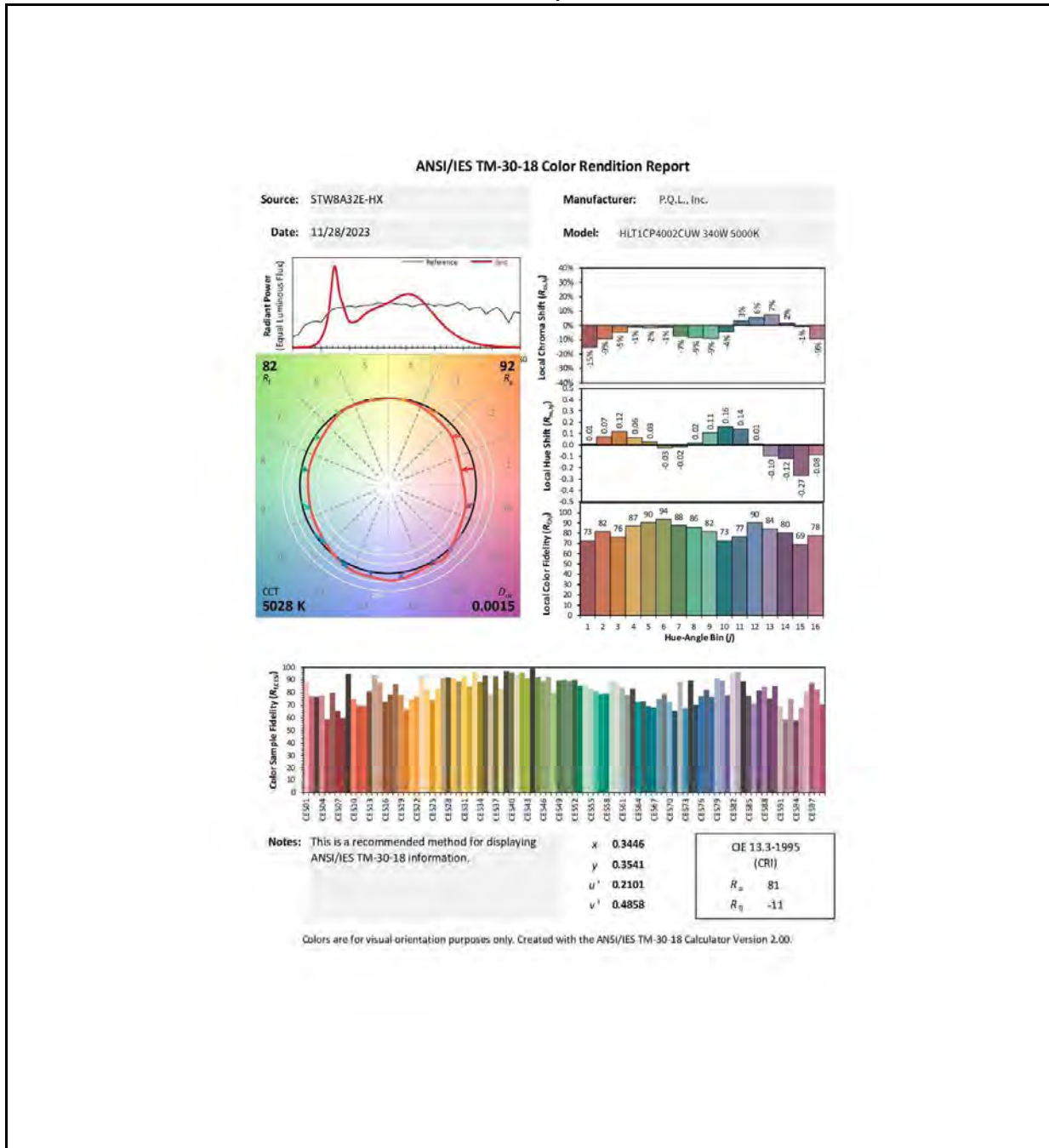
CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
5028	81	-11.0	0.0015	49657.6	150.20	N/A



Luminous Flux (lm)	49657.6	Chrom x	0.3446
Chrom y	0.3541	Chrom u	0.2101
Chrom v	0.3239	Duv	0.0015
Chrom u'	0.2101	Chrom v'	0.4858
CCT (K)	5028	Luminous Efficacy (lm/W)	150.20
Ra	81	R1	79.0
R2	90.0	R3	94.0
R4	77.0	R5	80.0
R6	85.0	R7	83.0
R8	59.0	R9	-11.0
R10	76.0	R11	76.0
R12	62.0	R13	82.0
R14	97.0	R15	72.0
Rf	82	Rg	92
Rcs,h1	-15%		

# Integrating Sphere Test (Cont'd)

## TM-30 Report



### Integrating Sphere Test

<b>Model No.</b>	HLT1CP4002CUW 270W 5000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

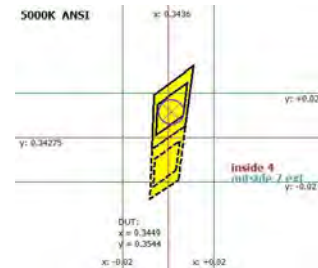
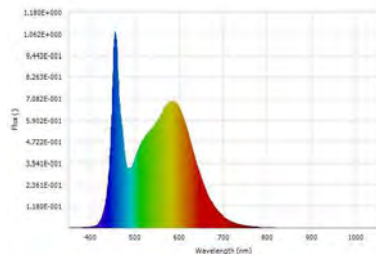
1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.  
 2.Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.  
 3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

#### Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.43	60	2.1633	259.72	0.9969	Horizontal

#### Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
5017	81	-11.0	0.0015	40410.1	155.59	N/A



Luminous Flux (lm)	40410.1	Chrom x	0.3449
Chrom y	0.3544	Chrom u	0.2102
Chrom v	0.3240	Duv	0.0015
Chrom u'	0.2102	Chrom v'	0.4860
CCT (K)	5017	Luminous Efficacy (lm/W)	155.59
Ra	81	R1	79.0
R2	90.0	R3	94.0
R4	77.0	R5	80.0
R6	85.0	R7	83.0
R8	59.0	R9	-11.0
R10	76.0	R11	76.0
R12	62.0	R13	82.0
R14	97.0	R15	72.0
Rf	82	Rg	92
Rcs,h1	-15%		



### Goniophotometer Test

<b>Model No.</b>	HLT1CP4002CUW 400W 4000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

<p>1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.</p> <p>2.Photometric parameters were measured using a type C goniophotometer and software.</p> <p>3.The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is rated current 3.8581A, 3.8558A, 3.8466A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.</p> <p>4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonallumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.</p>
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#### Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.3	120.18	60	3.2099	385.215	0.9985	1.94%	Horizontal

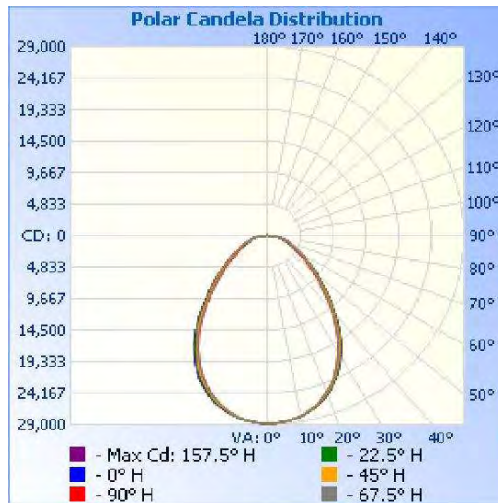
#### Test Results

Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)
	20°-50°	N/A	Horizontal Spread	Vertical Spread	
57017.0	54.90%	N/A	79.6	83.1	148.01

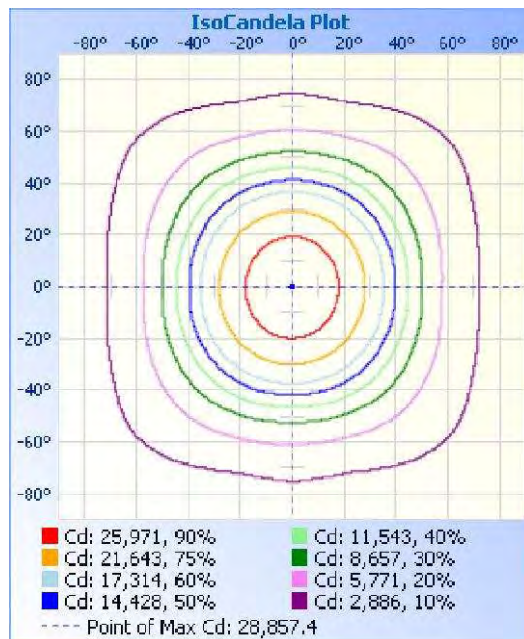
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
26.1	25.9	N/A	N/A

**Goniophotometer Test (Cont'd)**  
Polar Candela Distribution



IsoCandela Plot



**Goniophotometer Test (Cont'd)**  
**Zonal Lumen Summary**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	21128.1	37.10%
0-40	32406.6	56.80%
0-60	48212.5	84.60%
60-90	8615.2	15.10%
70-100	4117.9	7.20%
90-120	58.9	0.10%
0-90	56827.7	99.70%
90-180	189.3	0.30%
0-180	57017.0	100.00%

**Lumens Per Zone**

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	686.2	1.20%	90-95	24.8	0.00%
5-10	2027.2	3.60%	95-100	8.4	0.00%
10-15	3269.7	5.70%	100-105	7.0	0.00%
15-20	4338.9	7.60%	105-110	6.2	0.00%
20-25	5158.3	9.00%	110-115	6.2	0.00%
25-30	5647.7	9.90%	115-120	6.3	0.00%
30-35	5769.6	10.10%	120-125	7.2	0.00%
35-40	5509.0	9.70%	125-130	8.6	0.00%
40-45	4936.6	8.70%	130-135	10.4	0.00%
45-50	4272.8	7.50%	135-140	12.4	0.00%
50-55	3605.9	6.30%	140-145	13.8	0.00%
55-60	2990.6	5.20%	145-150	14.6	0.00%
60-65	2489.2	4.40%	150-155	14.6	0.00%
65-70	2041.3	3.60%	155-160	14.2	0.00%
70-75	1614.6	2.80%	160-165	13.3	0.00%
75-80	1236.5	2.20%	165-170	11.4	0.00%
80-85	858.1	1.50%	170-175	7.3	0.00%
85-90	375.5	0.70%	175-180	2.5	0.00%

## Goniophotometer Test (Cont'd)

### Intensity Data(cd)

Candela Table - Type C																	
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	28857	28857	28857	28857	28857	28857	28857	28857	28857	28857	28857	28857	28857	28857	28857	28857	28857
1	28820	28790	28814	28798	28803	28764	28759	28857	28802	28796	28803	28778	28799	28739	28761	28839	28812
2	28786	28779	28813	28780	28772	28737	28717	28818	28778	28763	28774	28761	28773	28701	28724	28807	28784
3	28746	28749	28773	28754	28754	28711	28679	28758	28728	28736	28734	28712	28726	28667	28672	28761	28741
4	28704	28692	28721	28703	28706	28659	28632	28704	28664	28651	28664	28647	28665	28596	28592	28707	28704
5	28636	28628	28642	28638	28660	28589	28572	28643	28573	28573	28598	28566	28604	28543	28524	28614	28632
6	28554	28547	28571	28568	28588	28526	28510	28560	28485	28487	28499	28486	28504	28458	28456	28550	28544
7	28461	28461	28482	28471	28496	28427	28428	28481	28412	28404	28413	28380	28401	28360	28376	28466	28479
8	28376	28370	28391	28376	28405	28354	28330	28382	28311	28310	28294	28261	28294	28257	28282	28377	28397
9	28268	28252	28252	28234	28272	28239	28217	28253	28196	28168	28149	28104	28121	28138	28141	28246	28268
10	28158	28123	28102	28082	28119	28097	28084	28125	28059	28017	27983	27912	27937	27967	27992	28105	28130
11	28006	27974	27930	27898	27946	27926	27909	27973	27918	27865	27808	27719	27746	27772	27828	27962	27973
12	27828	27784	27754	27708	27748	27753	27746	27813	27745	27691	27592	27498	27536	27584	27656	27792	27832
13	27647	27618	27558	27506	27537	27553	27572	27628	27584	27519	27402	27295	27303	27371	27465	27618	27660
14	27436	27442	27355	27277	27304	27341	27382	27448	27398	27324	27194	27058	27052	27150	27230	27421	27463
15	27220	27236	27130	27045	27062	27088	27174	27236	27191	27109	26952	26792	26786	26898	27008	27204	27277
16	27016	27005	26884	26788	26797	26828	26933	27024	26956	26865	26692	26530	26480	26586	26732	26961	27018
17	26799	26752	26618	26492	26498	26517	26642	26760	26706	26594	26410	26221	26176	26255	26458	26691	26776
18	26537	26460	26328	26179	26178	26187	26339	26486	26421	26305	26092	25882	25833	25921	26115	26408	26493
19	26230	26163	26003	25846	25834	25843	25995	26178	26134	25981	25754	25536	25469	25549	25773	26088	26196
20	25902	25847	25691	25532	25483	25494	25657	25862	25809	25658	25400	25177	25116	25174	25429	25750	25866
25	23989	23944	23745	23530	23458	23539	23760	23966	23945	23735	23426	23126	23049	23122	23433	23840	24016
30	21539	21403	21179	20884	20800	20981	21265	21455	21463	21190	20828	20447	20361	20458	20866	21293	21504
35	18625	18578	18320	17968	17843	18076	18445	18648	18623	18362	17984	17542	17335	17528	17988	18456	18686
40	15517	15350	15115	14689	14526	14791	15213	15390	15318	15124	14794	14310	14045	14308	14836	15249	15450
45	12454	12343	12142	11675	11433	11740	12157	12260	12190	12001	11009	11347	11022	11337	11800	12270	12447
50	9912	9795	9627	9214	8869	9234	9586	9657	9626	9515	9366	8963	8557	8924	9447	9751	9941
55	7789	7594	7501	7143	6763	7169	7514	7506	7525	7392	7353	6998	6554	6994	7451	7599	7779
60	6102	5898	5961	5645	5182	5642	5941	5884	5938	5762	5828	5511	5044	5545	5963	5932	6104
65	4859	4589	4778	4567	4055	4537	4721	4597	4759	4492	4656	4441	3964	4486	4606	4873	
70	3819	3454	3695	3630	3145	3622	3643	3445	3738	3386	3624	3558	3078	3563	3648	3445	3808
75	2939	2575	2747	2821	2449	2830	2694	2524	2894	2515	2709	2796	2384	2748	2685	2556	2942
80	2045	1870	1979	2071	1871	2090	1950	1858	2068	1857	1955	2053	1798	1998	1922	1850	2054
85	1174	1103	1224	1329	1131	1344	1246	1127	1230	1093	1194	1289	1036	1237	1165	1076	1169
90	52	134	222	279	194	289	229	131	47	108	186	230	141	217	169	110	54
95	20	17	17	17	15	17	20	16	16	16	16	16	18	15	15	18	16
100	16	14	15	14	13	14	13	15	16	15	15	16	16	15	16	14	16
105	12	11	12	11	12	12	15	10	12	12	11	14	10	13	12	12	10
110	11	11	14	14	13	13	13	13	13	11	12	12	11	12	13	13	13
115	12	13	12	13	12	13	12	13	13	14	11	12	12	14	10	11	10
120	13	12	14	13	13	13	15	13	14	14	12	13	14	15	15	12	17
125	18	18	16	18	17	18	18	18	19	18	18	16	16	19	18	16	17
130	23	22	23	22	22	23	22	22	24	22	22	24	22	23	24	24	22
135	29	29	28	29	28	30	30	31	31	31	28	30	28	28	29	30	32
140	37	38	37	37	36	37	38	39	38	40	38	36	36	39	39	38	38
145	46	46	45	46	44	46	47	45	46	48	45	45	46	46	48	48	46
150	54	55	54	50	54	54	54	54	56	54	52	55	55	56	56	54	55
155	61	64	61	58	59	64	64	60	65	62	66	63	59	62	62	63	66
160	75	77	74	72	71	71	73	75	74	75	74	72	72	74	76	74	75
165	92	88	87	88	87	86	88	89	88	87	87	87	90	89	88	89	89
170	102	102	102	102	101	102	102	104	103	102	99	102	103	102	102	103	102
175	102	101	102	104	104	103	104	102	102	103	102	103	105	105	104	105	104
180	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107

### Goniophotometer Test

<b>Model No.</b>	HLT1CP4002CUW 400W 5000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

<p>1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.</p> <p>2.Photometric parameters were measured using a type C goniophotometer and software.</p> <p>3.The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is rated current 3.8581A, 3.8558A, 3.8466A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.</p> <p>4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonallumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.</p>
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#### Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.4	120.16	60	3.2692	392.279	0.9986	2.02%	Horizontal

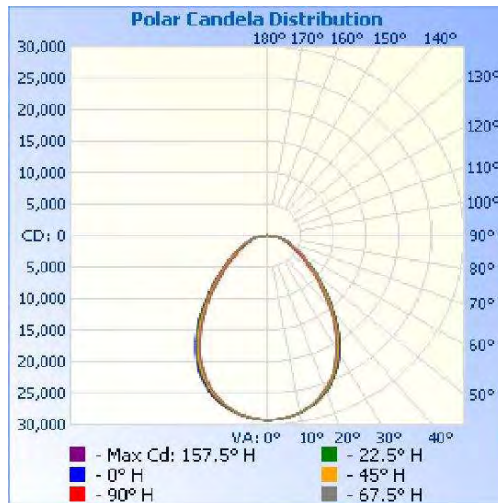
#### Test Results

Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)
	20°-50°	N/A	Horizontal Spread	Vertical Spread	
57829.1	54.90%	N/A	79.5	83.2	147.42

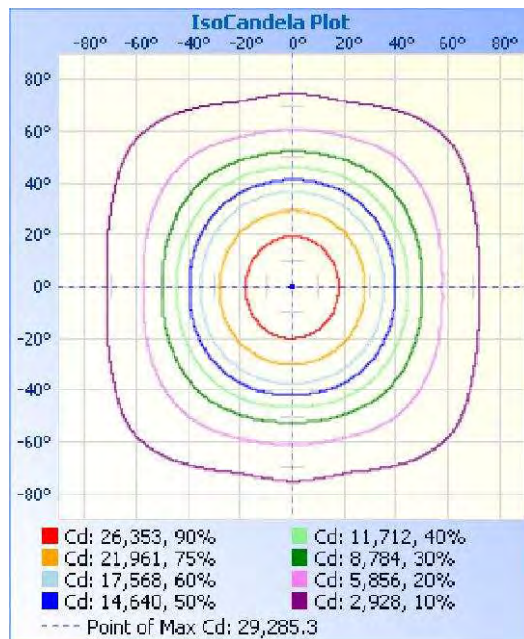
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
26.1	25.9	N/A	N/A

**Goniophotometer Test (Cont'd)**  
Polar Candela Distribution



IsoCandela Plot



**Goniophotometer Test (Cont'd)**  
Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	21432.0	37.10%
0-40	32863.0	56.80%
0-60	48896.1	84.60%
60-90	8740.6	15.10%
70-100	4176.7	7.20%
90-120	60.3	0.10%
0-90	57636.7	99.70%
90-180	192.4	0.30%
0-180	57829.1	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	696.0	1.20%	90-95	25.5	0.00%
5-10	2055.7	3.60%	95-100	8.6	0.00%
10-15	3315.1	5.70%	100-105	7.2	0.00%
15-20	4401.9	7.60%	105-110	6.3	0.00%
20-25	5230.5	9.00%	110-115	6.2	0.00%
25-30	5732.8	9.90%	115-120	6.5	0.00%
30-35	5845.6	10.10%	120-125	7.3	0.00%
35-40	5585.3	9.70%	125-130	8.6	0.00%
40-45	5010.7	8.70%	130-135	10.6	0.00%
45-50	4335.9	7.50%	135-140	12.5	0.00%
50-55	3653.3	6.30%	140-145	14.0	0.00%
55-60	3033.2	5.20%	145-150	14.8	0.00%
60-65	2529.6	4.40%	150-155	14.9	0.00%
65-70	2068.3	3.60%	155-160	14.5	0.00%
70-75	1638.5	2.80%	160-165	13.4	0.00%
75-80	1256.1	2.20%	165-170	11.5	0.00%
80-85	866.4	1.50%	170-175	7.4	0.00%
85-90	381.7	0.70%	175-180	2.5	0.00%

**Goniophotometer Test (Cont'd)**  
**Intensity Data(cd)**

Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	29281	29281	29281	29281	29281	29281	29281	29281	29281	29281	29281	29281	29281	29281	29281	29281	29281
1	29232	29209	29222	29204	29203	29165	29174	29285	29219	29207	29215	29196	29202	29163	29177	29268	29235
2	29193	29185	29222	29195	29178	29131	29146	29209	29183	29162	29175	29156	29164	29106	29116	29228	29202
3	29142	29158	29196	29169	29166	29110	29102	29176	29131	29118	29141	29124	29137	29074	29062	29176	29176
4	29104	29088	29144	29118	29110	29072	29050	29137	29079	29057	29088	29070	29067	29022	29006	29136	29116
5	29049	29027	29034	29042	29051	29004	28995	29050	28982	28989	29002	28985	28994	28952	28928	29052	29052
6	28943	28944	28946	28970	28983	28930	28918	28964	28909	28876	28887	28865	28901	28846	28841	28960	28951
7	28852	28858	28877	28866	28894	28849	28844	28909	28827	28783	28771	28749	28789	28740	28738	28869	28859
8	28752	28782	28777	28764	28795	28750	28752	28801	28747	28696	28656	28629	28660	28640	28647	28763	28776
9	28656	28657	28644	28617	28660	28657	28647	28681	28635	28574	28533	28496	28512	28518	28546	28662	28678
10	28551	28532	28481	28457	28497	28506	28496	28555	28500	28449	28384	28327	28350	28361	28410	28529	28559
11	28420	28357	28308	28275	28321	28319	28323	28390	28330	28283	28201	28125	28128	28170	28247	28365	28423
12	28244	28194	28116	28076	28107	28118	28151	28206	28159	28094	27978	27880	27914	27970	28045	28184	28243
13	28031	28023	27947	27874	27903	27916	27959	28028	27961	27894	27780	27638	27673	27726	27815	27992	28054
14	27834	27831	27741	27667	27683	27714	27767	27837	27780	27697	27521	27396	27396	27484	27600	27789	27842
15	27619	27629	27500	27417	27426	27463	27556	27642	27572	27478	27295	27151	27120	27226	27364	27558	27643
16	27396	27391	27247	27163	27162	27183	27308	27416	27349	27258	27063	26891	26840	26942	27125	27333	27416
17	27159	27131	26984	26857	26845	26887	27039	27171	27105	26984	26790	26608	26545	26623	26846	27098	27178
18	26910	26845	26690	26552	26524	26557	26726	26868	26848	26707	26483	26287	26217	26292	26542	26831	26921
19	26629	26545	26374	26201	26177	26201	26397	26588	26553	26371	26150	25926	25855	25953	26192	26516	26619
20	26308	26217	26052	25880	25858	25846	26042	26254	26203	26012	25774	25564	25467	25539	25821	26174	26281
25	24354	24292	24070	23829	23792	23862	24118	24325	24318	24073	23743	23432	23329	23431	23759	24169	24371
30	21914	21725	21490	21146	21039	21238	21550	21825	21826	21509	21150	20746	20610	20774	21182	21650	21899
35	18927	18850	18565	18161	18033	18284	18695	18938	18923	18625	18193	17736	17508	17722	18202	18699	18956
40	15773	15581	15300	14841	14656	14949	15424	15641	15603	15395	15038	14537	14270	14525	15084	15543	15755
45	12602	12540	12309	11804	11571	11894	12322	12451	12390	12269	11900	11515	11175	11504	12006	12472	12657
50	10066	9940	9740	9322	8991	9355	9728	9792	9778	9659	9503	9089	8673	9053	9574	9896	10085
55	7883	7673	7572	7217	6831	7253	7601	7596	7631	7489	7453	7098	6662	7096	7560	7714	7881
60	6202	5993	6054	5737	5265	5734	6022	5970	6031	5854	5923	5600	5134	5641	6059	6018	6196
65	4929	4648	4843	4628	4116	4608	4791	4664	4836	4566	4726	4508	4022	4558	4843	4668	4944
70	3864	3501	3741	3680	3190	3664	3692	3484	3785	3435	3670	3607	3122	3614	3698	3493	3864
75	2990	2622	2801	2865	2489	2877	2743	2562	2941	2558	2754	2844	2423	2789	2732	2597	2990
80	2075	1894	1994	2089	1887	2115	1984	1883	2102	1884	1984	2076	1818	2022	1950	1875	2080
85	1186	1119	1238	1334	1138	1355	1256	1135	1238	1108	1207	1296	1037	1249	1180	1094	1180
90	61	145	230	287	200	296	235	133	53	119	195	244	150	228	177	118	63
95	18	18	19	19	16	19	20	17	17	16	19	17	16	17	18	17	17
100	14	16	15	14	13	14	12	16	15	14	15	11	13	14	16	16	14
105	13	12	14	10	14	14	14	14	13	13	13	11	12	14	12	10	13
110	10	9	9	12	12	13	12	13	13	13	10	11	11	13	11	12	14
115	10	14	10	12	12	13	14	13	13	14	13	14	11	14	9	15	12
120	14	14	15	13	15	15	14	14	16	14	15	12	14	14	16	14	14
125	19	14	15	18	17	17	19	20	19	17	20	16	17	19	20	18	19
130	24	23	25	22	22	22	21	23	25	25	24	23	24	24	24	24	24
135	33	30	29	27	29	30	28	30	31	29	29	28	28	31	31	29	32
140	37	36	37	37	36	36	38	39	39	38	38	36	39	37	39	40	36
145	48	46	44	45	45	46	45	48	46	46	45	46	46	48	48	48	47
150	57	55	52	53	53	53	55	58	56	56	52	53	53	58	55	56	55
155	67	66	66	59	66	62	69	66	67	64	61	60	62	64	64	67	68
160	76	76	76	73	74	73	77	76	75	75	73	74	74	74	76	78	77
165	93	89	90	91	89	88	89	90	90	89	90	87	90	89	90	92	92
170	104	104	104	105	106	103	104	103	104	102	102	105	106	103	105	104	103
175	106	105	106	104	106	106	105	106	103	103	103	106	106	106	106	102	106
180	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109

### Goniophotometer Test

<b>Model No.</b>	HLT1CP4002CUW 340W 4000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

<p>1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.</p> <p>2.Photometric parameters were measured using a type C goniophotometer and software.</p> <p>3.The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is rated current 3.8581A, 3.8558A, 3.8466A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.</p> <p>4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonallumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.</p>
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#### Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.4	120.19	60	2.7048	324.451	0.9980	2.04%	Horizontal

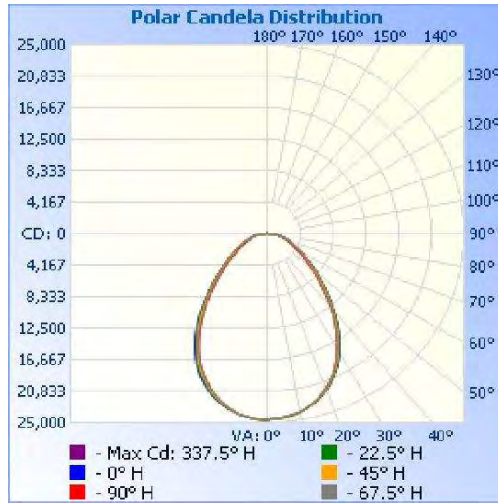
#### Test Results

Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)
	20°-50°	N/A	Horizontal Spread	Vertical Spread	
48580.1	54.90%	N/A	79.4	82.8	149.73

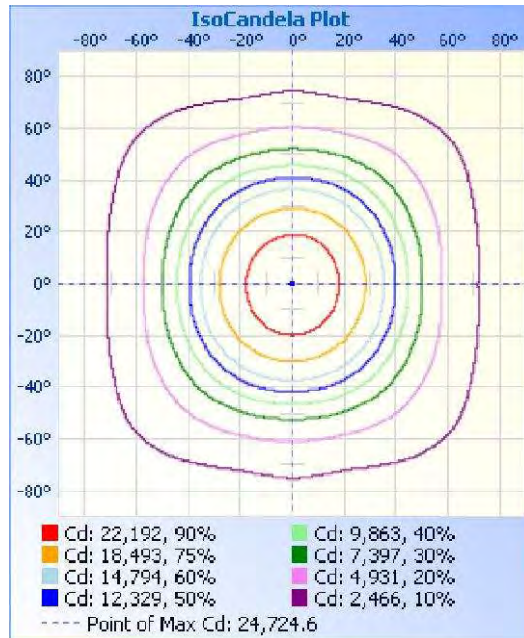
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
25.5	25.3	N/A	N/A

**Goniophotometer Test (Cont'd)**  
Polar Candela Distribution



IsoCandela Plot



**Zonal Lumen Summary**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	18039.1	37.10%
0-40	27647.2	56.90%
0-60	41087.3	84.60%
60-90	7334.5	15.10%
70-100	3503.6	7.20%
90-120	46.8	0.10%
0-90	48421.8	99.70%
90-180	158.3	0.30%
0-180	48580.1	100.00%

**Lumens Per Zone**

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	586.3	1.20%	90-95	18.2	0.00%
5-10	1731.3	3.60%	95-100	7.0	0.00%
10-15	2790.6	5.70%	100-105	5.9	0.00%
15-20	3703.7	7.60%	105-110	5.3	0.00%
20-25	4398.1	9.10%	110-115	5.0	0.00%
25-30	4829.2	9.90%	115-120	5.4	0.00%
30-35	4913.8	10.10%	120-125	6.2	0.00%
35-40	4694.2	9.70%	125-130	7.3	0.00%
40-45	4202.2	8.60%	130-135	9.0	0.00%
45-50	3632.5	7.50%	135-140	10.6	0.00%
50-55	3063.7	6.30%	140-145	11.8	0.00%
55-60	2541.7	5.20%	145-150	12.5	0.00%
60-65	2120.1	4.40%	150-155	12.5	0.00%
65-70	1736.0	3.60%	155-160	12.2	0.00%
70-75	1374.2	2.80%	160-165	11.3	0.00%
75-80	1055.3	2.20%	165-170	9.7	0.00%
80-85	727.9	1.50%	170-175	6.3	0.00%
85-90	320.9	0.70%	175-180	2.1	0.00%

**Goniophotometer Test (Cont'd)**  
**Intensity Data(cd)**

Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	24657	24657	24657	24657	24657	24657	24657	24657	24657	24657	24657	24657	24657	24657	24657	24657	24657
1	24481	24510	24538	24538	24554	24554	24570	24662	24625	24635	24657	24641	24652	24620	24639	24725	24693
2	24460	24487	24521	24523	24551	24510	24521	24612	24590	24611	24636	24621	24630	24572	24568	24696	24672
3	24427	24458	24530	24503	24525	24492	24478	24588	24552	24568	24597	24586	24590	24537	24550	24658	24640
4	24382	24404	24462	24466	24487	24450	24445	24537	24510	24507	24537	24522	24558	24482	24501	24593	24600
5	24313	24344	24379	24398	24436	24399	24400	24474	24439	24438	24468	24459	24469	24436	24430	24528	24530
6	24238	24269	24320	24322	24364	24324	24317	24385	24364	24352	24373	24366	24405	24359	24352	24450	24456
7	24176	24198	24223	24258	24281	24264	24247	24319	24287	24273	24289	24275	24299	24286	24276	24368	24382
8	24100	24131	24141	24158	24202	24188	24173	24232	24209	24204	24190	24182	24198	24188	24205	24288	24307
9	23998	24039	24050	24051	24092	24085	24086	24140	24121	24114	24083	24062	24077	24077	24092	24200	24222
10	23905	23929	23912	23915	23960	23968	23969	24020	24004	23964	23937	23917	23928	23947	23971	24088	24108
11	23774	23768	23768	23758	23806	23822	23827	23880	23848	23833	23777	23728	23748	23785	23839	23942	23975
12	23623	23620	23592	23578	23622	23642	23670	23724	23701	23675	23592	23535	23548	23594	23670	23790	23820
13	23466	23474	23428	23394	23434	23459	23517	23576	23544	23512	23423	23330	23355	23408	23485	23632	23659
14	23303	23322	23250	23198	23248	23280	23356	23426	23389	23340	23231	23130	23134	23214	23308	23462	23494
15	23126	23138	23071	22991	23034	23078	23166	23248	23216	23150	23044	22933	22904	22984	23106	23283	23320
16	22938	22950	22881	22780	22827	22860	22955	23056	23033	22956	22835	22696	22670	22759	22894	23092	23140
17	22740	22751	22652	22550	22583	22592	22722	22854	22814	22740	22586	22441	22413	22496	22664	22856	22920
18	22500	22498	22392	22286	22292	22320	22468	22617	22578	22494	22304	22154	22105	22201	22382	22618	22711
19	22230	22218	22114	21998	21972	22019	22164	22343	22307	22211	22027	21859	21816	21860	22077	22352	22428
20	21957	21945	21814	21690	21670	21705	21868	22048	22039	21912	21723	21546	21490	21550	21758	22036	22148
25	20343	20332	20166	20045	20016	20038	20234	20450	20441	20261	20052	19844	19766	19836	20047	20370	20533
30	18271	18208	18011	17769	17707	17877	18140	18352	18343	18135	17833	17525	17424	17551	17889	18251	18440
35	15800	15748	15533	15228	15134	15334	15679	15883	15874	15660	15340	14977	14812	14971	15366	15760	15935
40	13118	13023	12816	12459	12313	12570	12938	13109	13066	12913	12654	12240	12020	12232	12704	13065	13219
45	10527	10450	10262	9874	9669	9963	10320	10434	10308	10303	10007	9606	9402	9675	10162	10464	10614
50	8396	8286	8137	7789	7501	7825	8148	8212	8202	8109	7988	7645	7298	7611	8057	8318	8478
55	6579	6423	6344	6042	5713	6069	6370	6374	6404	6283	6259	5953	5585	5960	6353	6486	6628
60	5160	4990	5050	4784	4387	4787	5049	5008	5070	4918	4973	4703	4305	4732	5091	5061	5214
65	4119	3890	4053	3877	3437	3855	4016	3914	4066	3840	3973	3792	3379	3830	4071	3927	4164
70	3229	2929	3130	3083	2665	3074	3100	2918	3173	2884	3082	3036	2623	3038	3111	2940	3251
75	2489	2182	2334	2389	2080	2408	2298	2148	2477	2150	2312	2393	2041	2344	2297	2186	2517
80	1737	1584	1679	1757	1586	1778	1663	1579	1766	1583	1664	1750	1534	1705	1642	1577	1754
85	987	933	1033	1121	959	1141	1053	950	1037	929	1016	1097	884	1056	996	917	992
90	38	108	174	215	143	221	179	104	44	87	139	170	100	160	124	85	52
95	14	14	15	15	13	12	16	16	15	15	17	13	12	16	13	15	16
100	13	11	12	12	11	12	11	13	10	12	10	11	9	11	14	11	13
105	11	10	11	9	10	10	11	12	11	10	10	11	8	11	12	12	10
110	9	10	11	11	10	10	10	9	12	10	9	9	9	12	8	8	10
115	10	10	10	10	9	12	10	9	11	12	9	10	11	11	9	7	9
120	11	12	13	14	11	10	12	12	12	13	9	14	12	14	12	12	11
125	16	13	13	14	14	14	17	17	14	14	16	15	15	14	16	16	15
130	18	20	20	19	19	20	18	21	19	22	18	18	20	20	18	20	18
135	24	25	24	24	25	26	26	25	27	24	24	23	26	27	24	27	26
140	33	33	30	32	30	30	30	33	31	32	31	31	30	34	33	30	32
145	41	39	39	36	38	38	39	40	39	42	39	39	40	39	39	39	40
150	46	43	47	46	43	46	45	48	44	46	44	45	46	46	47	47	45
155	56	54	55	51	52	53	53	55	51	55	51	54	54	53	54	55	56
160	64	64	62	63	60	62	63	65	65	63	64	60	65	63	66	63	65
165	75	77	77	76	74	73	76	77	76	73	74	76	77	78	78	75	78
170	86	86	86	87	88	87	87	87	89	85	85	89	86	86	87	88	89
175	88	86	85	88	89	87	87	88	87	88	88	91	87	89	89	89	89
180	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92

### Goniophotometer Test

<b>Model No.</b>	HLT1CP4002CUW 340W 5000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

<p>1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.</p> <p>2.Photometric parameters were measured using a type C goniophotometer and software.</p> <p>3.The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is rated current 3.8581A, 3.8558A, 3.8466A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.</p> <p>4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonallumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.</p>
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#### Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.4	120.18	60	2.7640	331.539	0.9981	1.99%	Horizontal

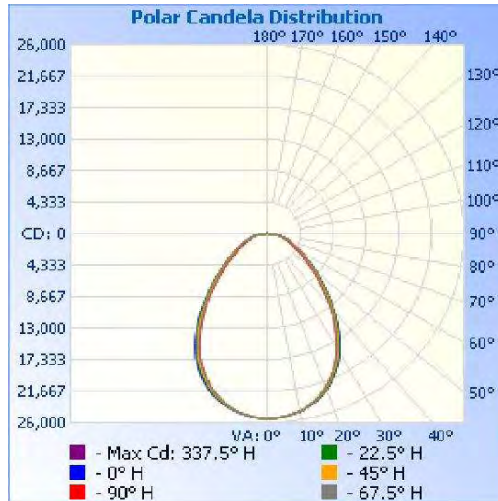
#### Test Results

Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)
	20°-50°	N/A	Horizontal Spread	Vertical Spread	
50184.6	55.00%	N/A	79.4	83.0	151.37

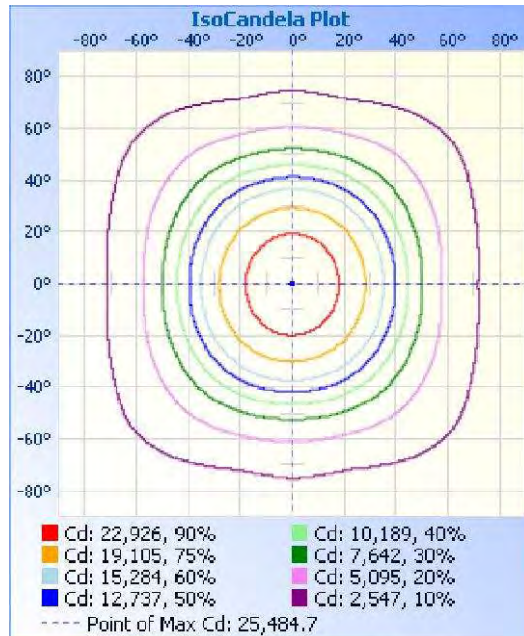
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
25.6	25.4	N/A	N/A

**Goniophotometer Test (Cont'd)**  
Polar Candela Distribution



IsoCandela Plot



**Goniophotometer Test (Cont'd)**  
**Zonal Lumen Summary**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	18636.9	37.10%
0-40	28558.5	56.90%
0-60	42449.6	84.60%
60-90	7572.9	15.10%
70-100	3614.5	7.20%
90-120	47.6	0.10%
0-90	50022.5	99.70%
90-180	162.1	0.30%
0-180	50184.6	100.00%

**Lumens Per Zone**

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	605.4	1.20%	90-95	17.7	0.00%
5-10	1787.6	3.60%	95-100	7.5	0.00%
10-15	2882.5	5.70%	100-105	6.1	0.00%
15-20	3827.9	7.60%	105-110	5.4	0.00%
20-25	4542.5	9.10%	110-115	5.3	0.00%
25-30	4990.9	9.90%	115-120	5.6	0.00%
30-35	5075.1	10.10%	120-125	6.3	0.00%
35-40	4846.5	9.70%	125-130	7.5	0.00%
40-45	4345.4	8.70%	130-135	9.2	0.00%
45-50	3754.3	7.50%	135-140	10.8	0.00%
50-55	3163.0	6.30%	140-145	12.2	0.00%
55-60	2628.5	5.20%	145-150	12.9	0.00%
60-65	2194.6	4.40%	150-155	12.8	0.00%
65-70	1789.0	3.60%	155-160	12.5	0.00%
70-75	1421.6	2.80%	160-165	11.6	0.00%
75-80	1087.8	2.20%	165-170	10.0	0.00%
80-85	748.3	1.50%	170-175	6.5	0.00%
85-90	331.6	0.70%	175-180	2.2	0.00%

## Goniophotometer Test (Cont'd)

### Intensity Data(cd)

Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	25473	25473	25473	25473	25473	25473	25473	25473	25473	25473	25473	25473	25473	25473	25473	25473	25473
1	25433	25407	25423	25399	25401	25363	25372	25454	25419	25409	25433	25416	25424	25385	25392	25485	25457
2	25387	25393	25407	25383	25380	25338	25321	25410	25384	25385	25392	25387	25384	25346	25353	25436	25427
3	25355	25353	25383	25347	25342	25294	25282	25359	25340	25328	25354	25337	25352	25291	25302	25392	25395
4	25324	25315	25331	25317	25313	25269	25246	25328	25291	25296	25297	25290	25294	25253	25249	25344	25353
5	25250	25244	25262	25263	25264	25206	25208	25270	25233	25215	25225	25218	25241	25195	25175	25290	25300
6	25174	25161	25183	25175	25185	25141	25150	25203	25144	25137	25146	25131	25150	25107	25093	25198	25204
7	25084	25068	25091	25079	25098	25069	25064	25114	25066	25044	25048	25023	25045	25012	25020	25109	25115
8	25007	24993	24991	24976	25000	24986	24972	25028	24975	24953	24935	24923	24920	24909	24922	25024	25034
9	24918	24911	24889	24872	24895	24886	24882	24918	24890	24855	24824	24802	24812	24814	24840	24935	24949
10	24813	24807	24779	24741	24771	24778	24776	24807	24790	24738	24704	24654	24662	24684	24732	24830	24856
11	24692	24676	24621	24593	24615	24623	24644	24685	24651	24612	24550	24470	24500	24526	24582	24686	24723
12	24534	24512	24459	24407	24439	24440	24477	24522	24488	24453	24364	24274	24288	24329	24413	24525	24563
13	24370	24346	24267	24205	24224	24256	24298	24344	24325	24274	24155	24058	24080	24126	24215	24349	24405
14	24192	24164	24069	23996	24016	24054	24118	24184	24143	24080	23960	23851	23840	23912	24009	24165	24231
15	24007	23981	23875	23787	23808	23822	23924	23996	23962	23894	23740	23616	23614	23690	23806	23990	24047
16	23827	23796	23672	23572	23578	23602	23717	23799	23769	23692	23540	23401	23358	23434	23594	23787	23856
17	23626	23587	23453	23337	23328	23347	23487	23607	23587	23472	23300	23155	23096	23176	23361	23580	23660
18	23395	23351	23221	23089	23074	23099	23228	23380	23346	23227	23047	22877	22817	22889	23104	23350	23430
19	23130	23087	22943	22801	22772	22783	22946	23104	23088	22934	22746	22570	22504	22573	22794	23071	23165
20	22814	22806	22638	22493	22440	22450	22629	22826	22802	22634	22423	22255	22166	22232	22461	22775	22869
25	21167	21074	20868	20670	20603	20682	20882	21121	21116	20912	20659	20401	20288	20367	20645	21014	21198
30	19043	18933	18702	18406	18316	18490	18766	19007	19019	18772	18450	18102	17979	18111	18474	18864	19079
35	16432	16303	16046	15677	15564	15794	16157	16389	16399	16167	15810	15412	15214	15393	15815	16248	16443
40	13660	13546	13286	12888	12724	12982	13390	13578	13548	13376	13071	12623	12392	12624	13108	13507	13686
45	10953	10850	10631	10209	9979	10277	10660	10707	10747	10652	10412	9903	9609	9903	10402	10911	10977
50	8741	8592	8412	8042	7744	8071	8398	8482	8484	8388	8246	7882	7526	7843	8304	8592	8753
55	6820	6649	6558	6244	5908	6277	6571	6584	6604	6492	6460	6144	5760	6141	6544	6686	6835
60	5378	5184	5242	4962	4550	4959	5222	5187	5240	5094	5147	4869	4460	4902	5264	5234	5386
65	4278	4022	4189	4004	3556	3981	4147	4035	4185	3957	4100	3913	3484	3955	4195	4048	4285
70	3341	3032	3235	3184	2758	3171	3190	3012	3275	2971	3179	3121	2702	3128	3201	3030	3346
75	2597	2268	2424	2476	2152	2494	2383	2228	2557	2226	2397	2472	2107	2426	2378	2258	2600
80	1792	1632	1726	1806	1628	1825	1706	1626	1812	1628	1709	1791	1571	1746	1681	1616	1794
85	1021	970	1072	1155	990	1176	1086	984	1075	962	1047	1132	912	1087	1027	946	1027
90	45	104	165	208	140	219	177	104	45	89	134	168	98	153	121	81	48
95	14	16	17	16	16	17	17	14	14	15	14	15	14	15	14	16	14
100	12	15	11	13	12	10	11	12	12	13	11	12	12	11	10	14	12
105	12	12	10	10	9	13	11	11	8	10	11	10	7	10	10	9	10
110	9	10	10	10	10	11	8	11	10	12	11	9	10	11	9	11	8
115	9	11	10	10	10	12	12	11	11	10	10	11	11	11	10	11	10
120	15	12	12	14	13	12	13	13	14	15	11	9	12	14	13	12	11
125	18	15	17	13	14	17	15	19	18	13	17	14	14	15	15	14	14
130	19	20	17	19	21	19	21	22	22	20	20	18	16	20	19	19	21
135	28	27	26	26	23	26	29	26	26	24	25	26	26	27	28	24	24
140	31	33	32	31	32	31	33	35	35	32	33	32	32	33	33	34	31
145	44	42	39	40	39	40	41	38	40	42	39	39	40	42	43	40	40
150	47	51	45	48	46	46	47	46	47	47	45	48	47	47	50	48	48
155	59	59	58	54	58	54	54	53	57	54	56	56	56	56	53	54	54
160	67	67	64	65	64	64	65	66	65	64	63	66	64	64	65	67	66
165	79	78	77	75	77	77	78	77	80	76	78	78	77	78	78	78	81
170	90	90	89	89	89	91	88	88	88	89	89	92	92	92	91	91	89
175	90	91	90	91	91	90	90	90	92	90	92	92	92	90	92	91	93
180	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95

### Goniophotometer Test

<b>Model No.</b>	HLT1CP4002CUW 270W 4000K	<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

#### Test Method

<p>1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.</p> <p>2.Photometric parameters were measured using a type C goniophotometer and software.</p> <p>3.The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is rated current 3.8581A, 3.8558A, 3.8466A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.</p> <p>4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonallumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.</p>
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#### Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.4	120.32	60	2.1380	256.454	0.9969	1.97%	Horizontal

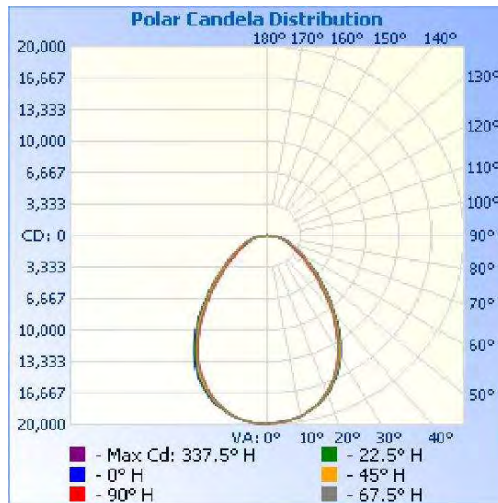
#### Test Results

Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)
	20°-50°	N/A	Horizontal Spread	Vertical Spread	
39430.1	54.90%	N/A	79.7	83.0	153.75

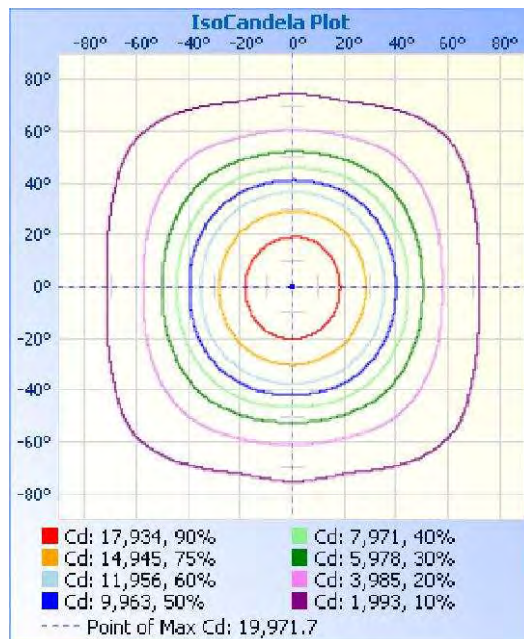
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
24.8	24.6	N/A	N/A

**Goniophotometer Test (Cont'd)**  
Polar Candela Distribution



IsoCandela Plot



**Goniophotometer Test (Cont'd)**  
**Zonal Lumen Summary**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	14623.2	37.10%
0-40	22410.8	56.80%
0-60	33328.8	84.50%
60-90	5974.6	15.20%
70-100	2862.4	7.30%
90-120	37.1	0.10%
0-90	39303.4	99.70%
90-180	126.7	0.30%
0-180	39430.1	100.00%

**Lumens Per Zone**

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	474.4	1.20%	90-95	13.9	0.00%
5-10	1402.3	3.60%	95-100	5.7	0.00%
10-15	2261.8	5.70%	100-105	4.8	0.00%
15-20	3003.9	7.60%	105-110	4.2	0.00%
20-25	3566.8	9.00%	110-115	4.1	0.00%
25-30	3914.0	9.90%	115-120	4.3	0.00%
30-35	3980.6	10.10%	120-125	5.0	0.00%
35-40	3807.1	9.70%	125-130	5.9	0.00%
40-45	3415.2	8.70%	130-135	7.1	0.00%
45-50	2951.0	7.50%	135-140	8.5	0.00%
50-55	2487.0	6.30%	140-145	9.6	0.00%
55-60	2064.8	5.20%	145-150	10.0	0.00%
60-65	1723.5	4.40%	150-155	10.0	0.00%
65-70	1408.3	3.60%	155-160	9.7	0.00%
70-75	1118.3	2.80%	160-165	9.1	0.00%
75-80	860.1	2.20%	165-170	7.8	0.00%
80-85	593.3	1.50%	170-175	5.1	0.00%
85-90	271.2	0.70%	175-180	1.7	0.00%

## Goniophotometer Test (Cont'd)

### Intensity Data(cd)

Candela Table - Type C																	
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	19926	19926	19926	19926	19926	19926	19926	19926	19926	19926	19926	19926	19926	19926	19926	19926	19926
1	19812	19820	19847	19859	19869	19860	19867	19921	19908	19907	19919	19909	19905	19889	19904	19972	19949
2	19800	19815	19848	19851	19862	19842	19835	19883	19882	19881	19883	19879	19902	19876	19877	19946	19940
3	19778	19802	19836	19830	19848	19818	19825	19899	19880	19841	19859	19890	19869	19874	19874	19920	19908
4	19751	19772	19809	19804	19826	19802	19797	19864	19842	19852	19862	19862	19878	19845	19842	19872	19903
5	19702	19735	19763	19770	19789	19766	19754	19822	19794	19798	19808	19815	19835	19800	19793	19872	19880
6	19641	19663	19705	19712	19733	19711	19702	19762	19732	19732	19743	19742	19770	19734	19726	19804	19815
7	19583	19605	19625	19633	19669	19650	19639	19689	19669	19658	19661	19666	19693	19660	19665	19736	19738
8	19516	19538	19553	19558	19590	19576	19572	19624	19599	19593	19592	19584	19602	19594	19597	19672	19680
9	19447	19470	19471	19482	19511	19509	19503	19551	19527	19517	19499	19491	19510	19513	19522	19597	19618
10	19373	19391	19383	19375	19417	19424	19426	19464	19442	19430	19406	19382	19402	19410	19432	19518	19529
11	19265	19280	19267	19261	19300	19317	19321	19363	19336	19317	19282	19244	19259	19289	19327	19410	19428
12	19140	19158	19133	19108	19150	19166	19202	19234	19218	19187	19148	19090	19096	19141	19192	19286	19300
13	19012	19025	18984	18956	18989	19020	19060	19107	19078	19053	18992	18916	18932	18980	19044	19147	19174
14	18878	18888	18830	18797	18823	18855	18907	18971	18951	18906	18834	18754	18750	18806	18886	19009	19036
15	18740	18748	18684	18625	18659	18691	18752	18825	18809	18762	18674	18572	18559	18635	18726	18868	18898
16	18598	18600	18527	18454	18490	18514	18578	18685	18654	18610	18496	18400	18377	18448	18557	18708	18748
17	18432	18438	18359	18276	18297	18324	18411	18518	18500	18428	18319	18201	18175	18238	18377	18538	18590
18	18249	18254	18164	18080	18090	18109	18215	18340	18319	18239	18102	17991	17952	18016	18166	18348	18409
19	18045	18040	17955	17856	17852	17877	17995	18130	18108	18024	17885	17750	17714	17760	17924	18122	18194
20	17812	17815	17711	17611	17607	17623	17764	17898	17889	17788	17632	17495	17451	17497	17664	17889	17968
25	16514	16487	16345	16223	16180	16250	16392	16562	16582	16444	16252	16069	15992	16057	16263	16543	16657
30	14811	14764	14614	14410	14353	14500	14734	14867	14885	14701	14466	14219	14130	14239	14513	14796	14936
35	12806	12732	12559	12323	12235	12404	12664	12854	12846	12683	12424	12138	11998	12132	12455	12764	12905
40	10645	10585	10412	10127	10002	10221	10522	10649	10627	10500	10284	9949	9776	9951	10317	10606	10738
45	8546	8490	8337	8021	7846	8002	8394	8472	8438	8367	8199	7868	7650	7862	8260	8500	8621
50	6829	6735	6602	6308	6085	6342	6603	6668	6665	6592	6492	6217	5931	6182	6549	6757	6892
55	5338	5215	5148	4897	4636	4922	5169	5174	5197	5106	5087	4835	4531	4835	5156	5262	5378
60	4197	4058	4104	3884	3565	3883	4107	4078	4119	4006	4046	3823	3502	3849	4142	4118	4239
65	3350	3153	3289	3143	2791	3127	3256	3186	3295	3119	3227	3077	2748	3109	3308	3198	3379
70	2615	2377	2537	2498	2162	2494	2513	2375	2581	2340	2504	2457	2128	2464	2528	2389	2637
75	2031	1785	1905	1953	1697	1963	1880	1759	2016	1760	1894	1956	1665	1918	1880	1789	2053
80	1414	1286	1362	1426	1287	1442	1349	1285	1438	1288	1356	1421	1247	1383	1334	1281	1424
85	810	768	848	920	793	936	866	784	854	765	836	902	737	869	822	757	818
90	56	92	133	164	106	169	139	90	47	82	108	127	73	116	91	69	57
95	12	12	12	12	11	12	12	13	10	12	10	11	10	12	12	12	11
100	10	10	10	10	10	10	10	9	10	8	11	9	8	9	9	9	9
105	8	8	9	9	9	9	9	9	9	8	8	6	7	10	10	6	9
110	8	8	8	9	8	9	8	9	8	8	8	6	7	7	8	10	
115	8	8	8	9	8	9	8	9	10	9	7	10	8	9	7	8	8
120	10	10	11	10	10	10	9	10	9	10	9	8	7	9	10	7	8
125	12	12	12	13	12	12	12	11	14	11	10	13	12	12	12	13	11
130	16	15	14	16	16	16	15	18	17	16	12	16	14	17	15	18	16
135	20	20	20	20	20	20	21	20	20	23	20	18	19	16	20	19	21
140	26	26	26	26	26	26	27	27	25	26	23	26	27	25	25	27	26
145	32	32	32	32	31	32	31	32	30	32	30	32	31	32	33	32	32
150	38	37	37	37	36	36	34	38	36	36	36	36	37	37	37	39	38
155	44	43	43	43	42	43	40	44	43	43	43	42	46	42	43	42	40
160	52	51	51	50	51	50	48	50	51	50	51	52	51	51	50	51	52
165	62	60	61	61	61	60	60	61	62	59	60	61	61	60	62	63	62
170	71	70	70	71	71	70	68	70	69	70	71	71	71	72	70	72	73
175	72	70	71	72	72	72	70	71	71	71	71	72	73	70	70	72	72
180	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74

### Goniophotometer Test

<b>Model No.</b>	HLT1CP4002CUW 270W 5000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

<p>1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.</p> <p>2.Photometric parameters were measured using a type C goniophotometer and software.</p> <p>3.The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is rated current 3.8581A, 3.8558A, 3.8466A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.</p> <p>4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonallumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.</p>
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#### Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.4	120.31	60	2.1837	261.933	0.9970	1.92%	Horizontal

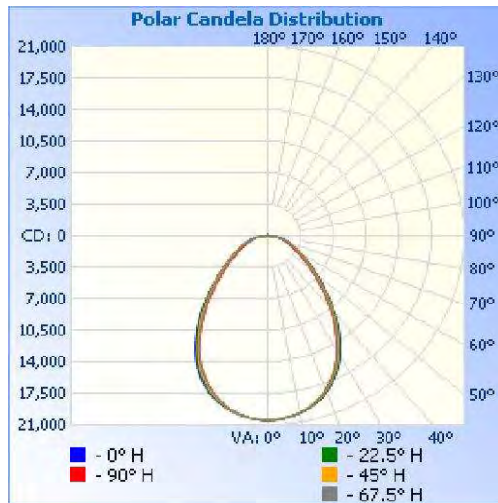
#### Test Results

Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)
	20°-50°	N/A	Horizontal Spread	Vertical Spread	
40607.9	54.90%	N/A	79.5	83.2	155.03

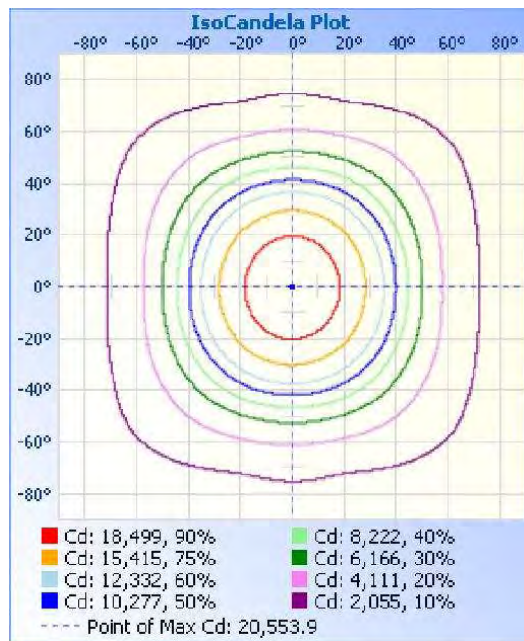
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
24.9	24.7	N/A	N/A

**Goniophotometer Test (Cont'd)**  
Polar Candela Distribution



IsoCandela Plot



**Goniophotometer Test (Cont'd)**  
Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	15066.0	37.10%
0-40	23083.2	56.80%
0-60	34325.4	84.50%
60-90	6153.9	15.20%
70-100	2945.6	7.30%
90-120	37.3	0.10%
0-90	40479.3	99.70%
90-180	128.6	0.30%
0-180	40607.9	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	488.2	1.20%	90-95	13.6	0.00%
5-10	1441.6	3.60%	95-100	5.8	0.00%
10-15	2329.1	5.70%	100-105	4.9	0.00%
15-20	3096.8	7.60%	105-110	4.4	0.00%
20-25	3676.3	9.10%	110-115	4.2	0.00%
25-30	4033.9	9.90%	115-120	4.3	0.00%
30-35	4100.1	10.10%	120-125	4.9	0.00%
35-40	3917.0	9.60%	125-130	6.0	0.00%
40-45	3517.0	8.70%	130-135	7.2	0.00%
45-50	3038.0	7.50%	135-140	8.6	0.00%
50-55	2559.3	6.30%	140-145	9.7	0.00%
55-60	2127.9	5.20%	145-150	10.3	0.00%
60-65	1776.8	4.40%	150-155	10.4	0.00%
65-70	1450.9	3.60%	155-160	9.9	0.00%
70-75	1152.6	2.80%	160-165	9.3	0.00%
75-80	885.3	2.20%	165-170	8.0	0.00%
80-85	610.9	1.50%	170-175	5.2	0.00%
85-90	277.5	0.70%	175-180	1.8	0.00%

## Goniophotometer Test (Cont'd)

### Intensity Data(cd)

Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	20554	20554	20554	20554	20554	20554	20554	20554	20554	20554	20554	20554	20554	20554	20554	20554	20554
1	20503	20487	20494	20482	20491	20456	20458	20528	20498	20498	20496	20498	20493	20471	20494	20537	20524
2	20481	20468	20485	20480	20465	20432	20414	20501	20471	20467	20491	20459	20478	20443	20448	20524	20498
3	20442	20438	20469	20440	20444	20401	20396	20460	20435	20442	20446	20422	20424	20398	20401	20474	20485
4	20400	20408	20421	20415	20418	20378	20369	20426	20396	20398	20400	20390	20400	20363	20364	20435	20448
5	20361	20352	20376	20374	20381	20341	20328	20380	20342	20345	20348	20336	20347	20323	20306	20383	20391
6	20277	20285	20310	20306	20321	20275	20273	20319	20280	20276	20275	20261	20284	20241	20241	20311	20314
7	20220	20224	20232	20231	20258	20206	20210	20248	20224	20193	20191	20184	20201	20177	20176	20256	20252
8	20160	20153	20152	20131	20172	20140	20132	20183	20154	20130	20106	20085	20116	20094	20099	20178	20187
9	20095	20087	20079	20061	20086	20074	20063	20098	20078	20054	20027	19983	20005	20012	20019	20095	20114
10	20002	20001	19965	19967	19986	19986	19994	20021	19982	19963	19921	19884	19897	19918	19936	20019	20030
11	19909	19905	19864	19834	19867	19872	19879	19909	19892	19854	19816	19750	19768	19787	19827	19912	19937
12	19787	19777	19730	19675	19724	19719	19745	19784	19761	19733	19710	19643	19657	19694	19694	19796	19815
13	19677	19680	19632	19570	19612	19621	19658	19702	19684	19640	19557	19471	19481	19521	19599	19688	19690
14	19549	19544	19470	19407	19422	19449	19507	19558	19533	19480	19382	19292	19291	19342	19422	19549	19586
15	19411	19394	19299	19232	19249	19273	19345	19409	19382	19323	19209	19105	19091	19153	19254	19393	19433
16	19260	19243	19138	19054	19064	19089	19174	19257	19225	19159	19030	18916	18896	18960	19078	19230	19286
17	19102	19071	18964	18872	18874	18899	18998	19084	19062	18991	18847	18720	18685	18750	18893	19065	19122
18	18914	18896	18772	18670	18658	18691	18794	18909	18893	18793	18646	18521	18478	18524	18688	18876	18946
19	18711	18678	18560	18439	18435	18446	18572	18708	18687	18583	18416	18280	18222	18287	18456	18662	18740
20	18470	18445	18316	18197	18166	18177	18325	18477	18456	18343	18166	18019	17956	18007	18193	18424	18502
25	17117	17044	16873	16719	16664	16726	16897	17079	17100	16931	16713	16505	16431	16489	16712	17003	17138
30	15381	15282	15105	14874	14799	14940	15164	15358	15373	15173	14916	14640	14538	14652	14933	15253	15418
35	13272	13163	12955	12659	12563	12752	13053	13245	13243	13053	12768	12449	12296	12432	12776	13120	13287
40	11054	10958	10741	10418	10288	10502	10817	10989	10965	10834	10583	10218	10034	10216	10603	10925	11066
45	8965	8779	8590	8249	8090	8315	8620	8720	8711	8637	8420	8085	7850	8073	8400	8759	8804
50	7071	6959	6807	6499	6261	6524	6799	6863	6859	6798	6678	6377	6084	6344	6716	6953	7084
55	5523	5387	5305	5052	4776	5066	5318	5328	5356	5261	5227	4975	4661	4973	5294	5406	5532
60	4352	4200	4242	4008	3683	4014	4230	4203	4246	4125	4169	3938	3607	3961	4263	4240	4359
65	3468	3262	3396	3242	2881	3221	3358	3276	3395	3212	3325	3167	2823	3198	3400	3281	3470
70	2708	2457	2626	2579	2232	2570	2590	2445	2656	2412	2576	2534	2191	2536	2597	2454	2713
75	2104	1846	1963	2008	1751	2022	1936	1813	2074	1810	1949	2005	1712	1970	1934	1836	2112
80	1460	1330	1404	1467	1322	1484	1390	1322	1479	1326	1394	1461	1276	1417	1371	1316	1464
85	842	797	873	944	814	963	887	808	882	791	860	928	754	888	842	779	840
90	54	94	130	162	104	166	139	91	46	78	106	121	73	110	88	76	53
95	12	12	12	15	10	13	12	13	10	12	13	12	9	11	11	11	12
100	9	11	10	10	10	10	11	12	10	8	10	9	8	12	10	10	8
105	7	7	9	8	8	9	8	8	8	8	11	8	8	8	7	7	9
110	9	8	8	7	7	8	9	9	8	9	8	10	9	8	8	8	8
115	6	6	7	7	9	7	8	7	10	9	9	10	6	8	7	7	8
120	9	10	8	7	9	9	8	10	12	11	9	8	9	10	10	7	10
125	11	11	12	12	11	12	13	12	12	12	13	12	11	12	12	12	10
130	15	16	14	17	14	13	16	16	16	16	14	15	16	17	13	16	16
135	22	20	19	20	21	22	19	20	20	21	20	22	20	21	22	21	21
140	24	28	25	24	26	26	27	27	26	27	25	25	26	26	26	25	27
145	33	32	32	31	31	33	33	34	32	32	33	32	32	34	32	33	32
150	40	38	40	38	38	35	36	37	38	38	39	39	40	40	40	38	38
155	45	44	46	41	41	45	40	45	45	45	41	44	46	46	49	48	43
160	52	54	53	50	50	51	49	51	51	52	51	50	51	52	54	53	53
165	64	63	64	64	62	63	61	63	60	61	60	60	62	62	63	64	64
170	70	71	73	72	73	73	72	72	73	72	72	72	71	74	74	75	73
175	73	71	73	75	75	74	74	72	73	74	70	74	72	72	75	72	74
180	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77

### THD and PF Test

<b>Model No.</b>	HLT1CP4002CUW 400W 4000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at 25 °C ± 1 °C. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

#### Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.3	120.18	60	3.2099	385.22	0.9985	1.94%	Horizontal
25.3	277.03	60	1.4117	376.53	0.9631	7.27%	Horizontal

### THD and PF Test

<b>Model No.</b>	HLT1CP4002CUW 400W 5000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at 25 °C ± 1 °C. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

#### Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.3	120.16	60	3.2692	392.28	0.9986	2.02%	Horizontal
25.3	277.00	60	1.4375	383.99	0.9645	7.05%	Horizontal

### THD and PF Test

<b>Model No.</b>	HLT1CP4002CUW 340W 5000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at 25 °C ± 1 °C. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

#### Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.3	120.19	60	2.7048	324.45	0.9980	2.04%	Horizontal
25.3	277.04	60	1.2319	325.21	0.9528	8.53%	Horizontal

### THD and PF Test

<b>Model No.</b>	HLT1CP4002CUW 270W 5000K		<b>Sample ID.</b>	6651567
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at 25 °C ± 1 °C. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

#### Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.3	120.31	60	2.1837	261.93	0.9970	1.92%	Horizontal
25.3	277.07	60	1.0020	257.60	0.9282	11.80%	Horizontal

### In-Situ Temperature Measurement Test

<b>Model No.</b>	HLT1CP4002CUW 400W 5000K	<b>Sample ID.</b>	6651567
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#### Test Method

1. In-Situ Temperature Measurement Test is conducted according to the UL 1598-2008, Section 14.
2. The testing was conducted in a room with ambient temperature of 25 °C ± 5 °C. The apparatus construction followed those described in UL1598-2008 for normal temperature testing. Thermocouples were placed on the LED package in the locations indicated by LM-80 report. Thermocouples were placed on the LED driver case in the locations specified by the manufacture if necessary. The temperature was recorded after the lamp was operated by 7.5 hours.
3. The data and photos in LM-80 test report is provided by the customer/ The data and photos in driver specification is provided by the

#### In-Situ Temperature Measurement Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
24.2	120.16	60	3.2692	392.28	0.9986	2.02%	Horizontal

#### Test Results (LEDs)

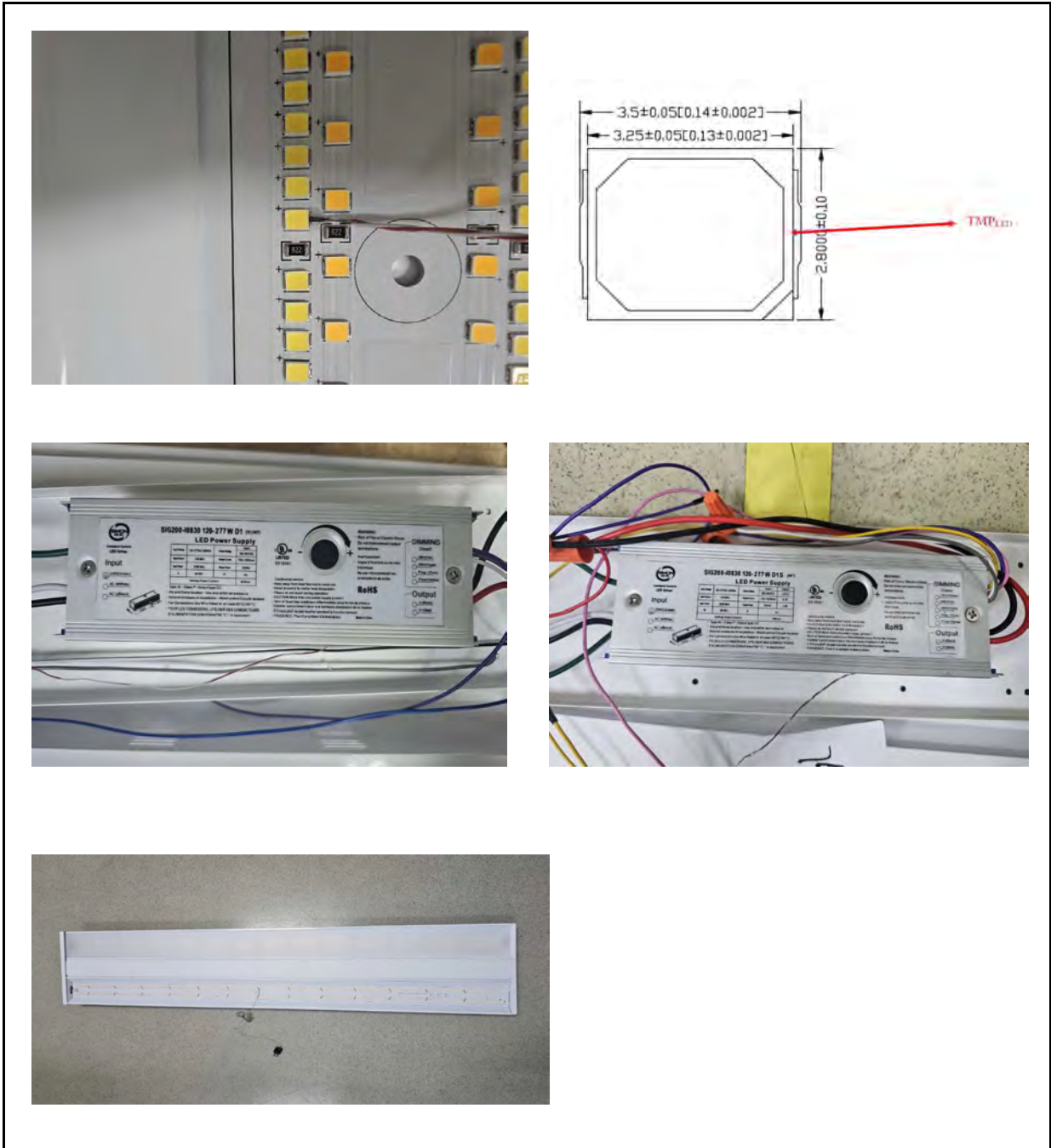
Thermocouple Location	Declared Light Source Current (mA)	Temperature for Light Source (°C)		Max Chromaticity Shift (1000-6000h)	LED Model Number	LM-80 Limit Current (mA)	LM-80 Limit Temp (°C)
		Test Result	Test Result (Correct to 25 °C)				
Ambient TEMP	N/A	24.2	25.0				
TMP of Location 1	45	91.5	92.3	0.0032	STW8A32E	100	105

#### Test Results (Drivers)

Thermocouple Location	Temperature for Driver (°C)		Driver Model Number	Driver Limit Temp (°C)
	Test Result	Test Result (Correct to 25 °C)		
Ambient TEMP	24.2	25.0		
TMP of Location 1	66.9	67.7	SIG200-I0830 120-277W D1	90
TMP of Location 2	61.0	61.8	SIG200-I0830 120-277W D1S	90

### In-Situ Temperature Measurement Test (Cont'd)

Test Photos for Ts Point of Light Sources & Tc Point of Drivers





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