



**Report Number:** PL09635-001A  
**Model:** LS8-100L-35K-10V-FD  
**Date:** 11/02/2016

## Cree Engineering Services Testing Laboratory (CESTL) Photometric Testing and Evaluation Report

**Prepared For:**

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Product Information	
Manufacturer	Cree Inc
Model Number (SKU)	LS8-100L-35K-10V-FD
Serial Number	PL09635-001
LED Type	XHG2

**Product Description**  
 Eight foot linear luminaire with a white, formed aluminum body and a diffuse cylindrical lens.

**Driver Information (Where Applicable)**  
 Integral

Length	Width	Height
96"	2.5"	3.0"





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Key Photometric Data	Sphere Output	Goniophotometer	
Luminous Flux	10248.0	10357.1	lm
Efficacy	130.63	131.70	lm/W
Correlated Color Temperature (CCT)	3405	K	
Color Rendering Index (CRI)	83		
R <sub>9</sub>	15		
Duv	0.000234		
S/P Ratio*	1.48		

Electrical Measurements	Sphere		Goniophotometer		
	120V	277V	120V	277V	
Input Wattage	78.45	77.60	78.64	77.67	W
Input Current	0.66	0.31	0.66	0.31	A
Input Voltage	120.05	276.99	120.02	277.03	V
Power Factor	0.989	0.909	0.990	0.908	
Off-State Power	0	0	0	0	W
Total Harmonic Distortion (Voltage)	0.06	0.08	0.07	0.07	%
Total Harmonic Distortion (Amperage)	8.63	21.44	8.30	20.52	%

**Note:** All photometric measurements taken at 120VAC.

Luminous Intensity Distribution	Goniophotometer	
Maximum Candela	2880.8	Cd
Horizontal Angle of Max Candela	67.5	°
Vertical Angle of Max Candela	2.5	°
Zonal Lumens (0° – 30°)	2217.9 (21.4%)	lm (%)
Zonal Lumens (0° – 40°)	3655.0 (35.3%)	lm (%)
Zonal Lumens (0° – 60°)	6631.2 (64%)	lm (%)
Zonal Lumens (60° – 90°)	2876.2 (27.8%)	lm (%)
Color Angular Uniformity	NA	

Key Test Parameters	Sphere Output	Goniophotometer	
Stabilization Time	60	31	min
Total Operating Time (Stabilization + Test)	60	51	min
Ambient Temperature	24.6	24.1	°C

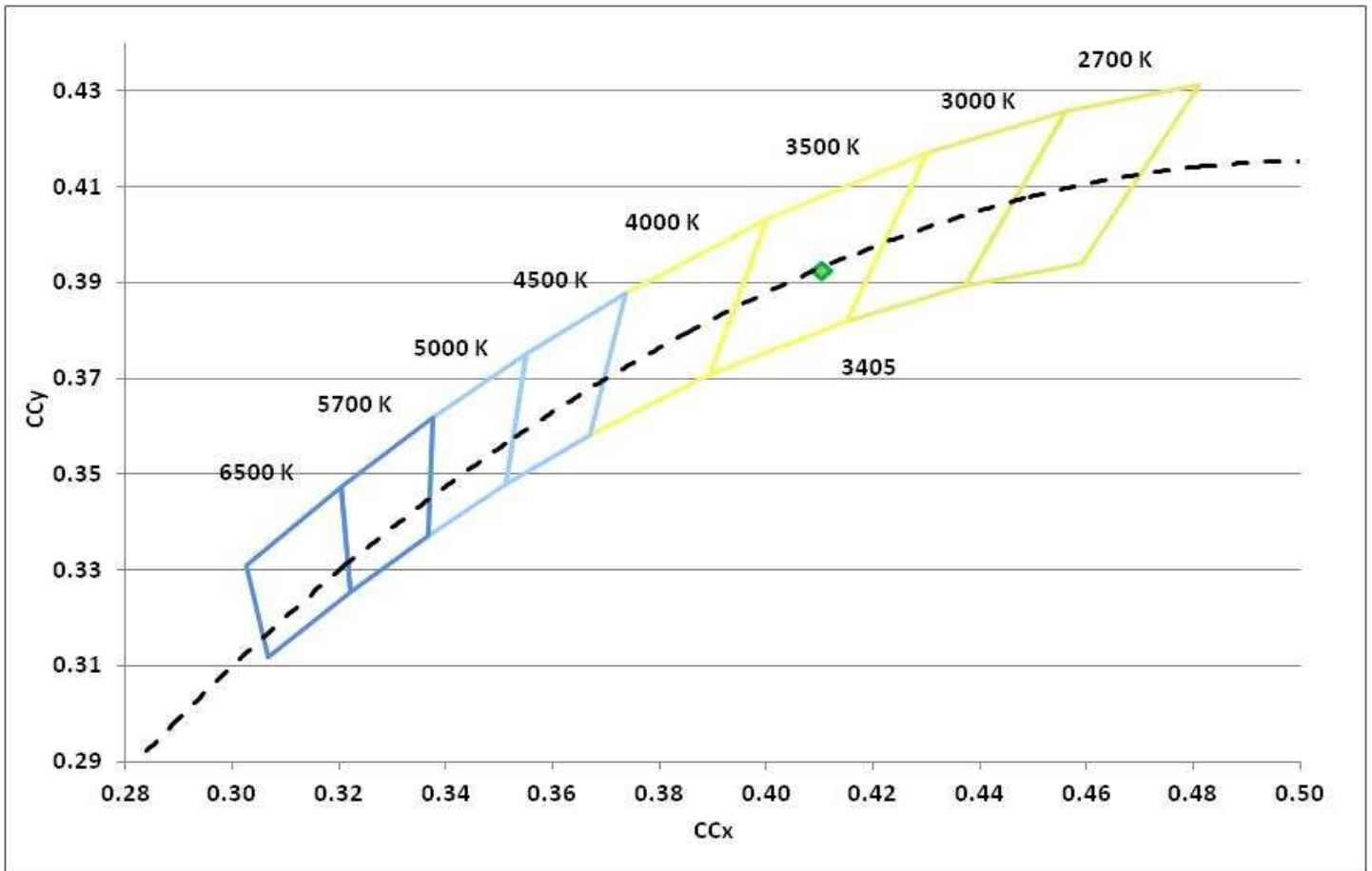
**Chromaticity Coordinates**

x	y	u	v	u'	v'	Duv
0.4104	0.3928	0.2382	0.3420	0.2382	0.5129	0.000234

**Color Rendering Index Details**

Ra	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
83	82	89	95	82	81	85	86	65	15	74	80	63	83	97

**Chromaticity Diagram**



**Spectral Distribution**

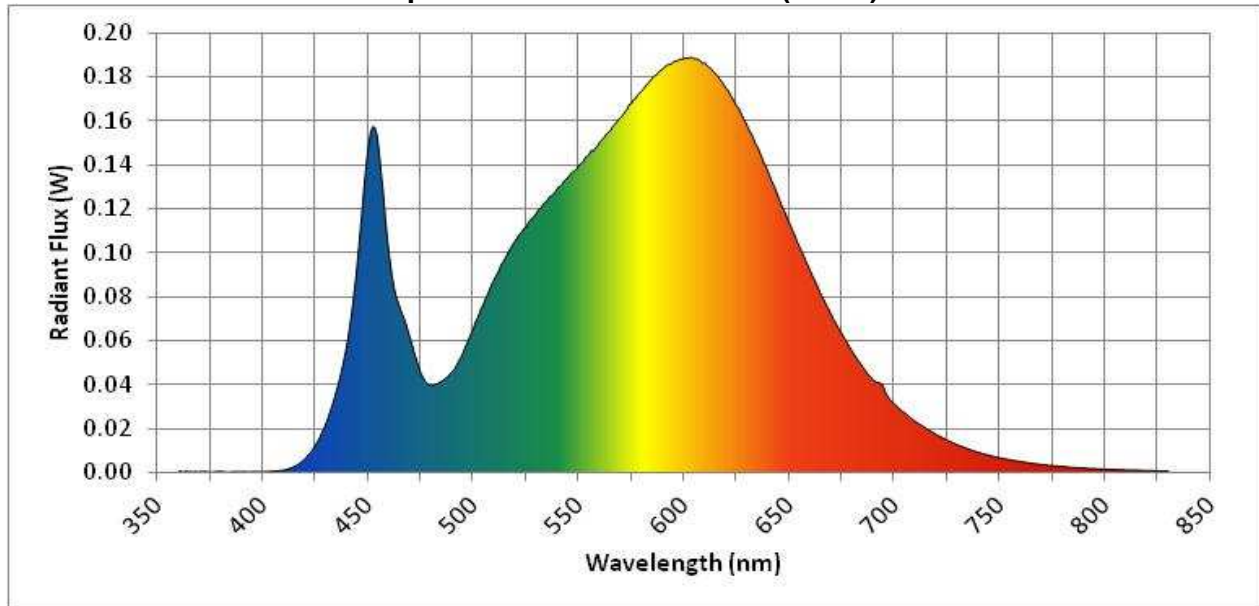
$\lambda$ (nm)	W/nm
360	0.000649
370	0.000602
380	0.000479
390	0.000370
400	0.000398
410	0.001186
420	0.006517
430	0.022989
440	0.059539
450	0.148705
460	0.097551
470	0.060481
480	0.039812
490	0.046090
500	0.065898
510	0.088364
520	0.105653

$\lambda$ (nm)	W/nm
530	0.118583
540	0.129739
550	0.139908
560	0.150579
570	0.161821
580	0.173746
590	0.183771
600	0.188457
610	0.186443
620	0.174908
630	0.157822
640	0.136635
650	0.113636
660	0.091791
670	0.071771
680	0.055067
690	0.042114

$\lambda$ (nm)	W/nm
700	0.031356
710	0.023264
720	0.017271
730	0.012636
740	0.009202
750	0.006749
760	0.005062
770	0.003735
780	0.002762
790	0.002124
800	0.001585
810	0.001216
820	0.000982
830	0.000790

<b>Dominant Wavelength</b>	581	nm
<b>Peak Wavelength:</b>	603	nm

**Spectral Power Distribution (W/nm)**





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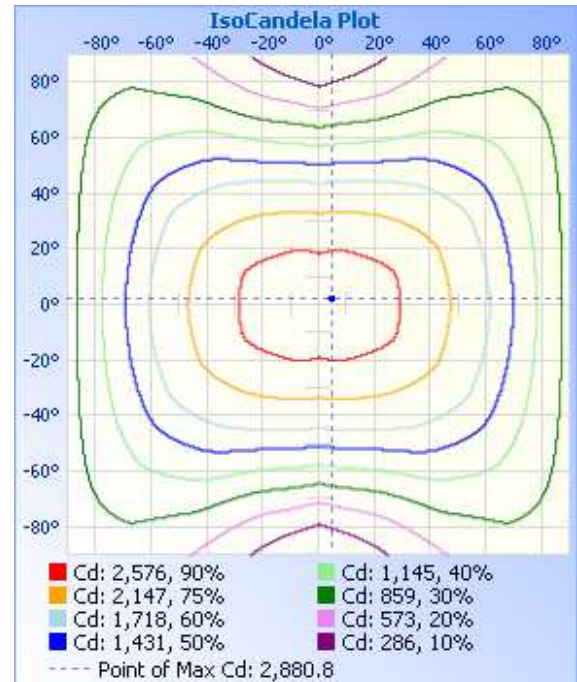
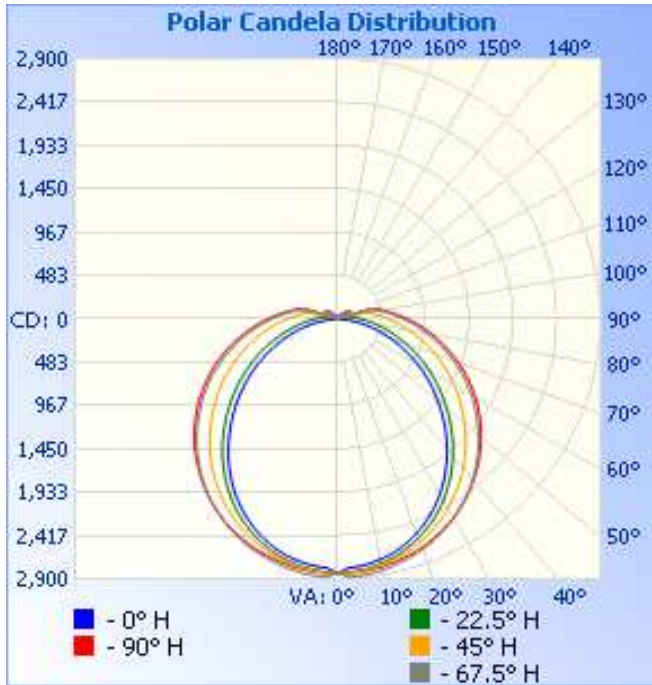
**Zonal Lumen Summary \*\***

Zone	Lumens	% of Total	Zone	Lumens	% of Total
0-5	67.8	0.7%	90-95	239.5	2.3%
5-10	201.0	1.9%	95-100	190.3	1.8%
10-15	327.6	3.2%	100-105	140.7	1.4%
15-20	443.8	4.3%	105-110	73.9	0.7%
20-25	546.3	5.3%	110-115	35.2	0.3%
25-30	631.4	6.1%	115-120	35.8	0.3%
30-35	696.6	6.7%	120-125	41.0	0.4%
35-40	740.5	7.1%	125-130	32.3	0.3%
40-45	762.1	7.4%	130-135	23.0	0.2%
45-50	762.6	7.4%	135-140	15.7	0.2%
50-55	743.5	7.2%	140-145	9.9	0.1%
55-60	707.9	6.8%	145-150	6.0	0.1%
60-65	656.8	6.3%	150-155	3.5	0%
65-70	592.6	5.7%	155-160	1.8	0%
70-75	519.6	5.0%	160-165	0.7	0%
75-80	443.0	4.3%	165-170	0.2	0%
80-85	367.2	3.5%	170-175	0.0	0%
85-90	297.1	2.9%	175-180	0.0	0%
			<b>Total</b>	<b>10357.1 lm</b>	<b>100%</b>

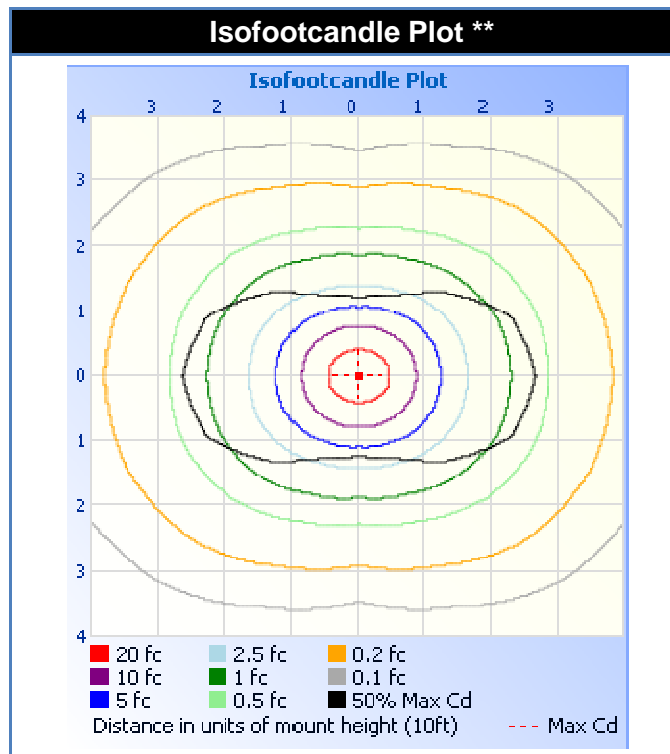
**Spacing Criteria \*\***

<b>Spacing Criterion (0 - 180)</b>	1.20
<b>Spacing Criterion (90 - 270)</b>	1.36
<b>Spacing Criterion (Diagonal)</b>	1.42

**Candela Plots \*\***



**Isofootcandle Plot \*\***





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### Candela Tabulations \*\*

	0	22.5	45	67.5	90
0	2835	2835	2835	2835	2835
2.5	2779	2825	2836	2881	2839
5	2769	2814	2827	2874	2833
7.5	2750	2796	2810	2862	2822
10	2724	2770	2789	2845	2806
12.5	2690	2737	2762	2823	2786
15	2650	2698	2730	2796	2764
17.5	2601	2653	2692	2767	2741
20	2546	2602	2651	2737	2714
22.5	2483	2544	2605	2701	2679
25	2413	2481	2554	2658	2642
27.5	2337	2411	2497	2612	2602
30	2258	2334	2436	2564	2557
32.5	2170	2252	2371	2510	2508
35	2077	2165	2304	2452	2456
37.5	1979	2075	2232	2389	2398
40	1880	1981	2157	2324	2337
42.5	1775	1882	2079	2254	2274
45	1670	1782	1999	2182	2207
47.5	1563	1680	1915	2108	2138
50	1455	1579	1830	2031	2066
52.5	1349	1477	1745	1951	1992
55	1243	1376	1662	1870	1914
57.5	1136	1277	1576	1790	1836
60	1029	1178	1490	1709	1757
62.5	922	1080	1404	1624	1675
65	818	984	1317	1538	1591
67.5	715	890	1231	1451	1505
70	614	798	1146	1364	1418
72.5	516	711	1062	1278	1332
75	423	628	980	1193	1246
77.5	333	551	901	1110	1161
80	249	479	824	1029	1077
82.5	168	414	752	951	996
85	93	355	684	875	919
87.5	28	303	620	803	844
90	0	258	561	734	773





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**Candela Tabulations (Continued) \*\***

	0	22.5	45	67.5	90
92.5	0	216	505	670	705
95	0	187	456	608	642
97.5	0	144	410	552	583
100	0	99	367	501	530
102.5	0	85	292	454	481
105	0	88	114	409	437
107.5	0	75	101	222	339
110	0	64	85	82	126
112.5	0	55	102	72	69
115	0	45	155	63	61
117.5	0	38	137	70	55
120	0	31	120	152	75
122.5	0	25	104	162	161
125	0	21	89	145	161
127.5	0	18	77	129	144
130	0	15	66	115	129
132.5	0	12	55	102	115
135	0	10	44	89	102
137.5	0	8	39	78	90
140	0	6	34	64	79
142.5	0	5	28	51	67
145	0	4	22	42	53
147.5	0	3	19	36	46
150	0	2	16	29	39
152.5	0	2	13	24	32
155	0	1	10	19	25
157.5	0	0	8	14	20
160	0	0	6	11	15
162.5	0	0	4	8	11
165	0	0	3	5	7
167.5	0	0	1	4	4
170	0	0	0	1	2
172.5	0	0	0	0	0
175	0	0	0	0	0
177.5	0	0	0	0	0
180	0	0	0	0	0



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### Integrating Sphere Equipment List

Description	Manufacturer	Model	Serial Number
3M Sphere	Labsphere	CSTM-CSLMS-3M98-HDS	82456
CCD Array Spectrometer	Otsuka	MC-9801	98010165
Programmable AC Source	Chroma	61603	616030000761
Single Channel Power Analyzer	Xitron	2801	28011110008
Aux Lamp Power Supply	Labsphere	LPS-100-0833	1002104538

### Goniophotometer Equipment List

Description	Manufacturer	Model	Serial Number
AC Power Source	Adaptive	FC210	2300229
AC Power Source	Elgar	CW1251	1126A06399
Type C Goniophotometer	LSI / UL	6440T	6440TE0192T
Spectroradiometer	Gooch & Housego	770VIS/NIR	11414155
Power Meter	Yokogawa	WT210	91L220953

### Test Methods Used:

Title	Description
ANSI C82.77:2002	Harmonic Emission Limits- Related Power Quality Req't's for Lighting Equipment
CIE Pub. 13.3:1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. 15:2004	Colorimetry
IES LM-58:1994	Spectroradiometric Measurements
IES LM-65:2001	Single-Ended Compact Fluorescent Lamps – Life Test Performance
IES LM-79:2008	Electrical and Photometric Measurements of Solid-State Lighting Products

### Reference Standard Used:

Equipment	Description
3m Sphere	Tungsten Halogen Omni-Directional 75W Calibration Lamp, Serial Number G141
Type C Goniophotometer	Tungsten Halogen Omni-Directional 500W Calibration Lamp, Serial Number 97A

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The results contained in this report pertain only to the tested sample.

This report shall not be reproduced, except in full, without written approval of the CESTL.

\* Items marked with a single asterisk are not covered by the NVLAP accreditation.

In the event that the recorded temperature is outside of  $25 \pm 1^\circ\text{C}$ , this is considered a non-standard condition.

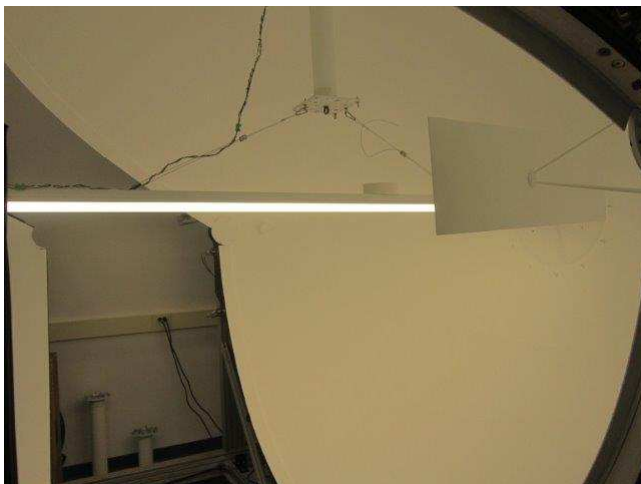
\*\* In the event that testing is subcontracted, test results in this report marked with the symbol \*\*, or noted as "Goniophotometer", were performed by the subcontracted laboratory identified in the footer on the first page of this report. Subcontracted testing is strictly goniophotometer based. All other tests are performed using an integrating sphere.

The goniophotometer information in the equipment list, report items marked with \*\*, or results specifically identified as "Goniophotometer", are the actual equipment used, and test results produced, by the subcontracted laboratory.

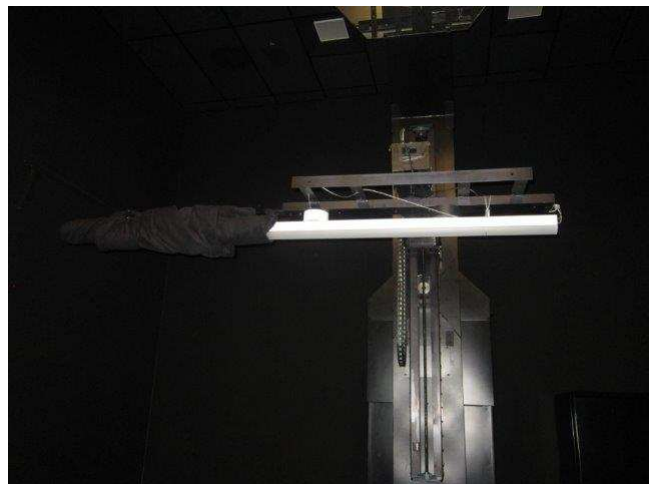
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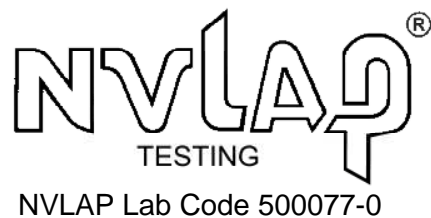
The photos below are intended to show the orientation and fixturing/set-up of the units under test. These are critical to understanding the results of the test given the sensitivity of many products and measurement systems to orientation and set-up considerations, and also for reproducing the conditions of the test.

**Sphere Picture**



**Goniophotometer Picture**





**Document Revision History:**

Each subsequent revision of this report replaces the preceding report.

Date	Rev	DCN #	Change Details	By	Approval
11/2/16	A	DMS	Origination	A. Gressel	C. McLaurin