

Photometric Test Report

Relevant Standards

- IES LM-79-2008
- ANSI C82.77-2017

Prepared For

RAB Lighting Inc.

Prepared By

Dongguan New Testing Centre Co., Ltd.

Prepare by:

Alan Wang

Engineer: Alan Wang

Date: 2021-10-09

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan

Issue Date: 2021-10-09

Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

Outdoor – Pole/Arm-Mounted Area and Roadway Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	1000		9587.0
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	Standard	Premium	147.5
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		65.0
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	5.96
		20.00%	277V	9.27
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
		0.9	277V	0.916
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	4046
		4 steps	3985±154	4046
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		73
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥40		-27
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		75
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		93
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-17%
Zonal Lumen Requirement (0°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	100%		100.0%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		2.2%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		120.0
(Goniophotometer – Section 4.2)		Non-Worst Case		277.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.551
(Goniophotometer – Section 4.2)		Non-Worst Case		0.254
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		65.0
(Goniophotometer – Section 4.2)		Non-Worst Case		63.7

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Goniophotometer Test	N/A	ALED5S78N/D10	N/A

Remark (If any)

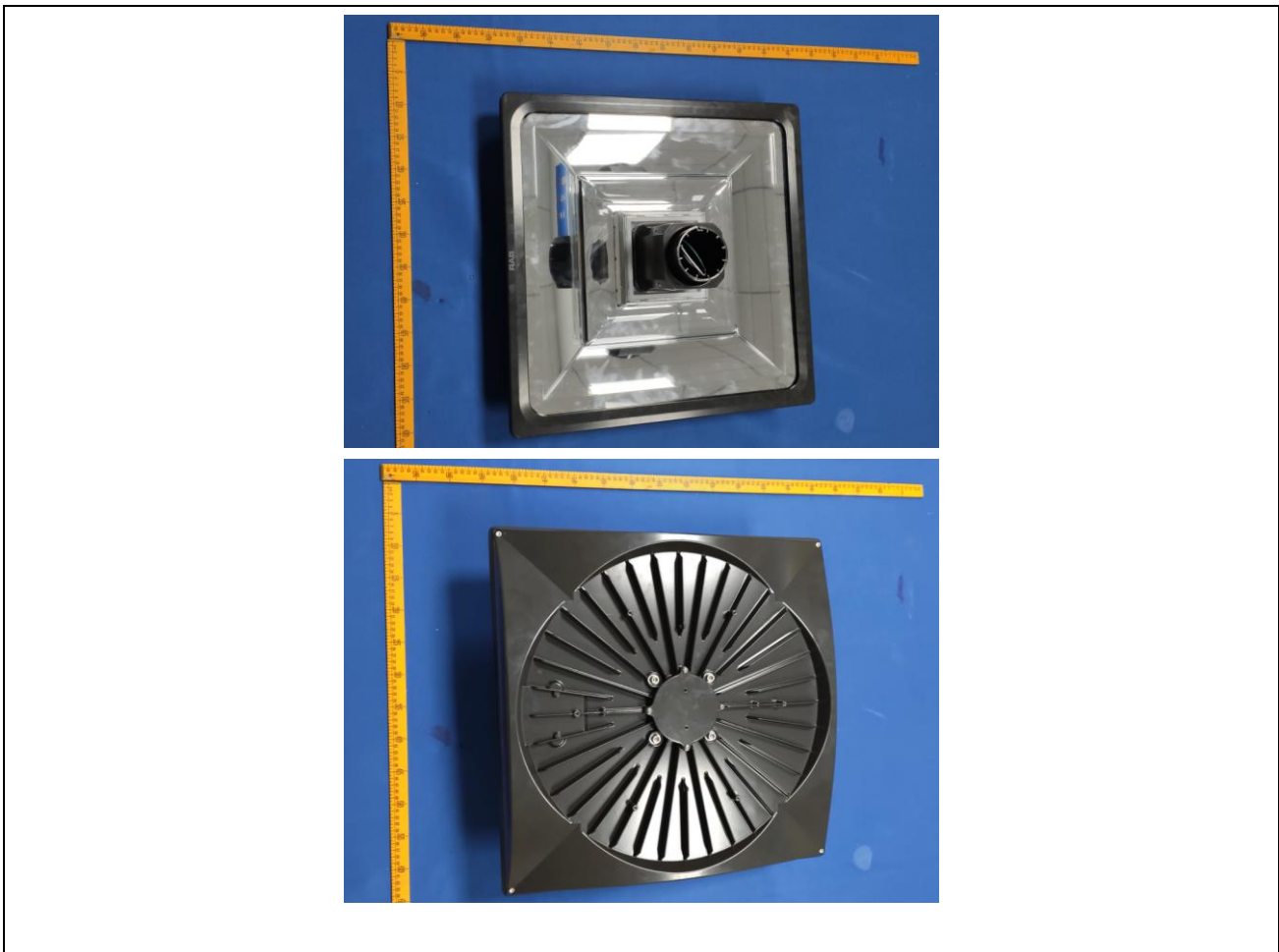
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.
4. The test result is based on the ALED5S78Y/D10

3.0 Product Description

Luminaire Description: Outdoor Area and Road Luminaires, Model No. ALED5S78N/D10, 4000K

Electrical Specification: 120-277Vac, 50/60Hz

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Goniophotometer Test

Model No.	ALED5S78N/D10	Sample ID	N/A
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.3	Humidity (%RH)	47.4

Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at 25±1°C, measured at a point not more than 1 m from the sample and at the same height as the sample.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.</p> <p>The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1.0° vertical intervals and 15° horizontal intervals.</p>

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.551	65.0	0.995
NON-WORST CASE	277.0	60	0.254	63.7	0.916

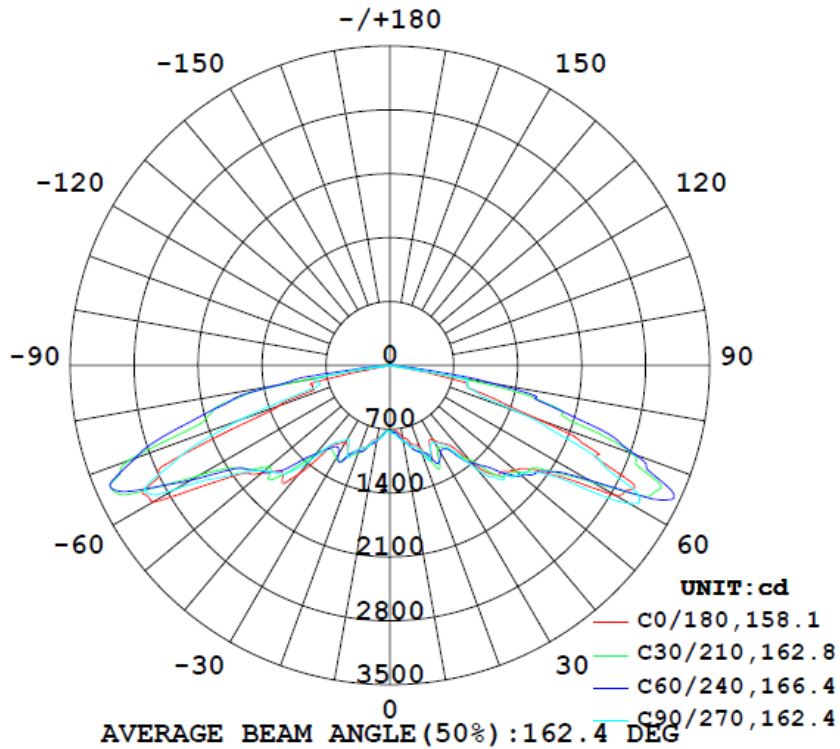
Test Result

Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement		BUG Rating
		C0-180	C90-270	C0-180	C90-270		(0°-90°)	(80°-90°)	
0°-180° zones	9587.0	146.7	164.2	111.1	144.6	147.5	100.0%	2.2%	B3-U1-G2

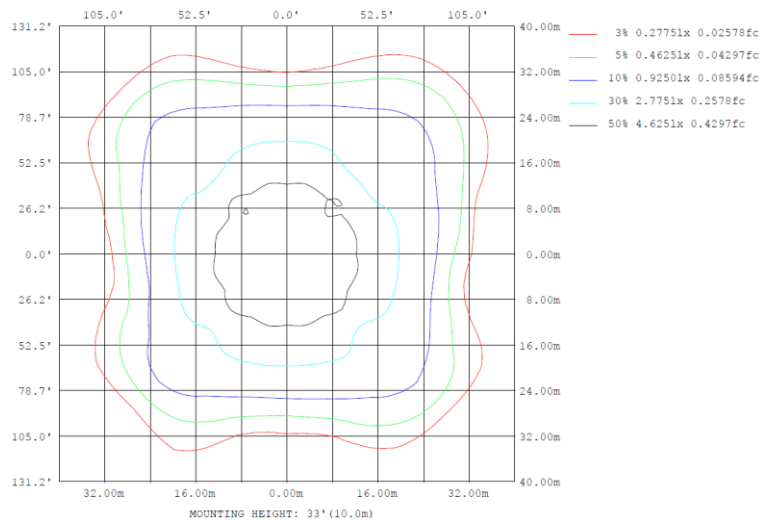
4.1 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.1 Goniophotometer Test

Zonal Lumen Summary

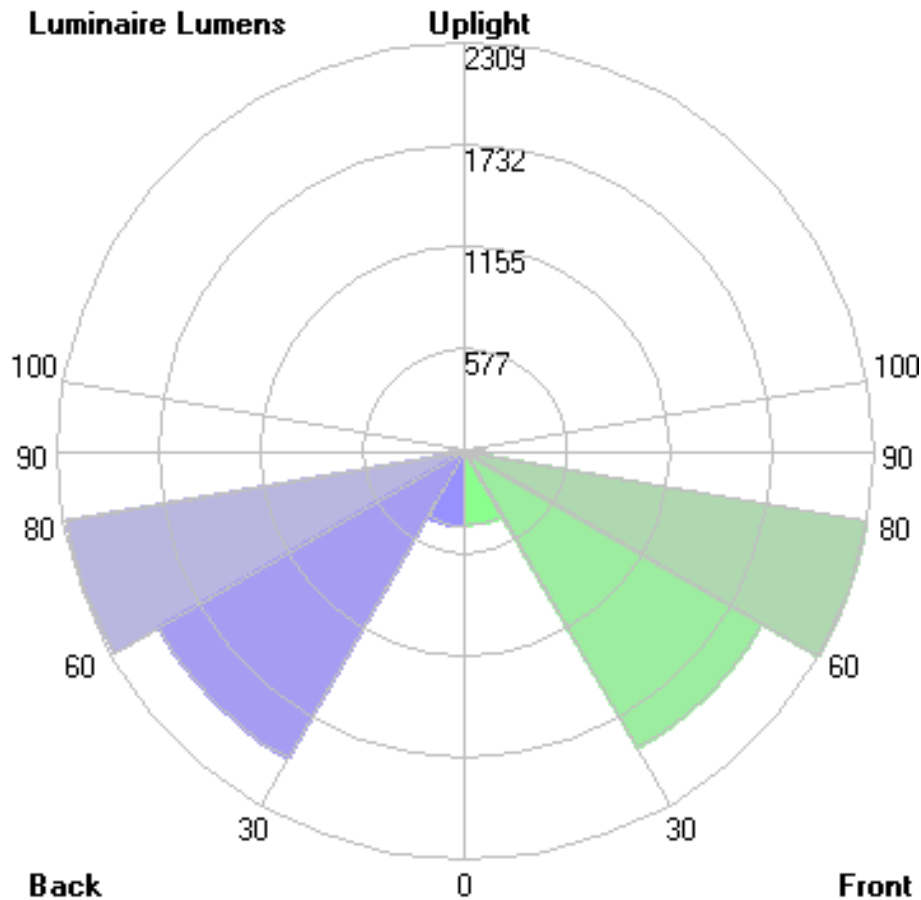
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	798.4	839.9	840.8	867.1	813.1	850.3	830.9	812.6	0- 10	74.38	74.38	0.78,0.78
20	951.1	1063	991.2	1076	972.3	1037	966.4	1017	10- 20	262.6	336.9	3.51,3.51
30	944.0	1426	980.3	1354	977.1	1231	935.5	1290	20- 30	505.2	842.2	8.78,8.78
40	1382	1128	1484	1153	1557	1085	1360	1072	30- 40	727.1	1569	16.4,16.4
50	1791	1959	1861	2111	1837	1881	1794	1704	40- 50	1272	2842	29.6,29.6
60	2844	2401	3027	2510	2995	2426	2725	2367	50- 60	1947	4788	49.9,49.9
70	1706	4179	1496	4146	1298	4188	1746	3901	60- 70	2858	7647	79.8,79.8
80	213.4	1164	806.1	1193	20.00	1178	794.7	1159	70- 80	1733	9379	97.8,97.8
90	0	0.8974	0.8966	0.9034	0	0	0	0	80- 90	207.5	9587	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0215	9587	100,100
110	0	0	0	0	0	0	0	0	100-110	0	9587	100,100
120	0	0	0	0	0	0	0	0	110-120	0	9587	100,100
130	0	0	0	0	0	0	0	0	120-130	0	9587	100,100
140	0	0	0	0	0	0	0	0	130-140	0	9587	100,100
150	0	0	0	0	0	0	0	0	140-150	0	9587	100,100
160	0	0	0	0	0	0	0	0	150-160	0	9587	100,100
170	0	0	0	0	0	0	0	0	160-170	0	9587	100,100
180	0	0	0	0	0	0	0	0	170-180	0	9587	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	74.38	0-10	74.38	0.78%
10-20	262.57	0-20	336.95	3.51%
20-30	505.24	0-30	842.19	8.78%
30-40	727.14	0-40	1569.33	16.37%
40-50	1272.44	0-50	2841.77	29.64%
50-60	1946.70	0-60	4788.47	49.95%
60-70	2858.40	0-70	7646.87	79.76%
70-80	1732.61	0-80	9379.48	97.84%
80-90	207.51	0-90	9586.99	100.00%
90-100	0.02	0-100	9587.01	100.00%
100-110	0.00	0-110	9587.01	100.00%
110-120	0.00	0-120	9587.01	100.00%
120-130	0.00	0-130	9587.01	100.00%
130-140	0.00	0-140	9587.01	100.00%
140-150	0.00	0-150	9587.01	100.00%
150-160	0.00	0-160	9587.01	100.00%
160-170	0.00	0-170	9587.01	100.00%
170-180	0.00	0-180	9587.01	100.00%

4.1 Goniophotometer Test

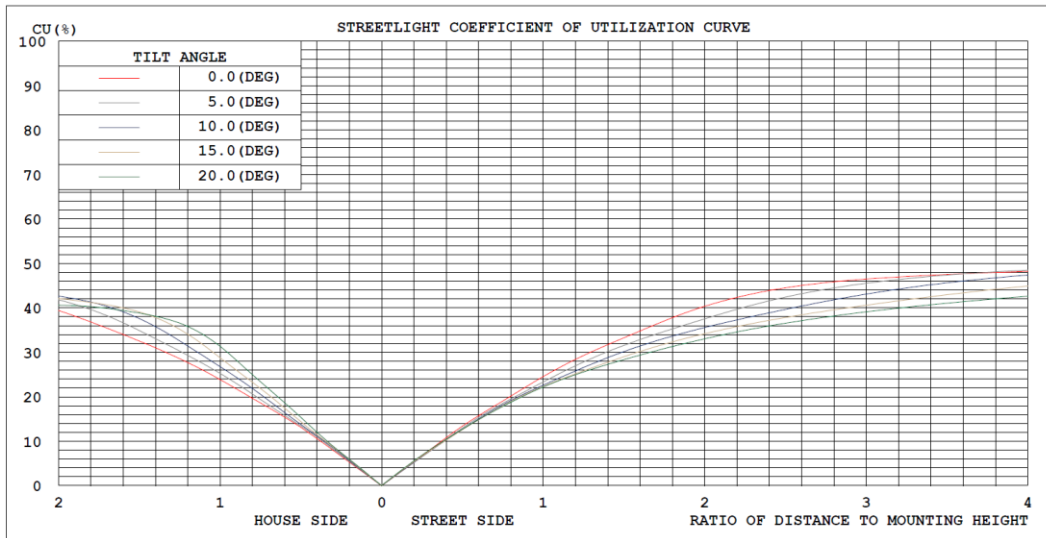
LCS/BUG



LCS Zone	Lumens	%Lamp	%Lum
FL (0-30)	418.0	N.A.	4.4
FM (30-60)	1942.0	N.A.	20.3
FH (60-80)	2309.4	N.A.	24.1
FVH (80-90)	111.1	N.A.	1.2
BL (0-30)	424.2	N.A.	4.4
BM (30-60)	2004.3	N.A.	20.9
BH (60-80)	2281.6	N.A.	23.8
BVH (80-90)	96.4	N.A.	1.0
UL (90-100)	< 0.05	N.A.	0.0
UH (100-180)	0.0	N.A.	0.0
Total	9587.0	N.A.	100.0
BUG Rating	B3-U1-G2		

4.1 Goniophotometer Test

Coefficients of Utilization



Isolines

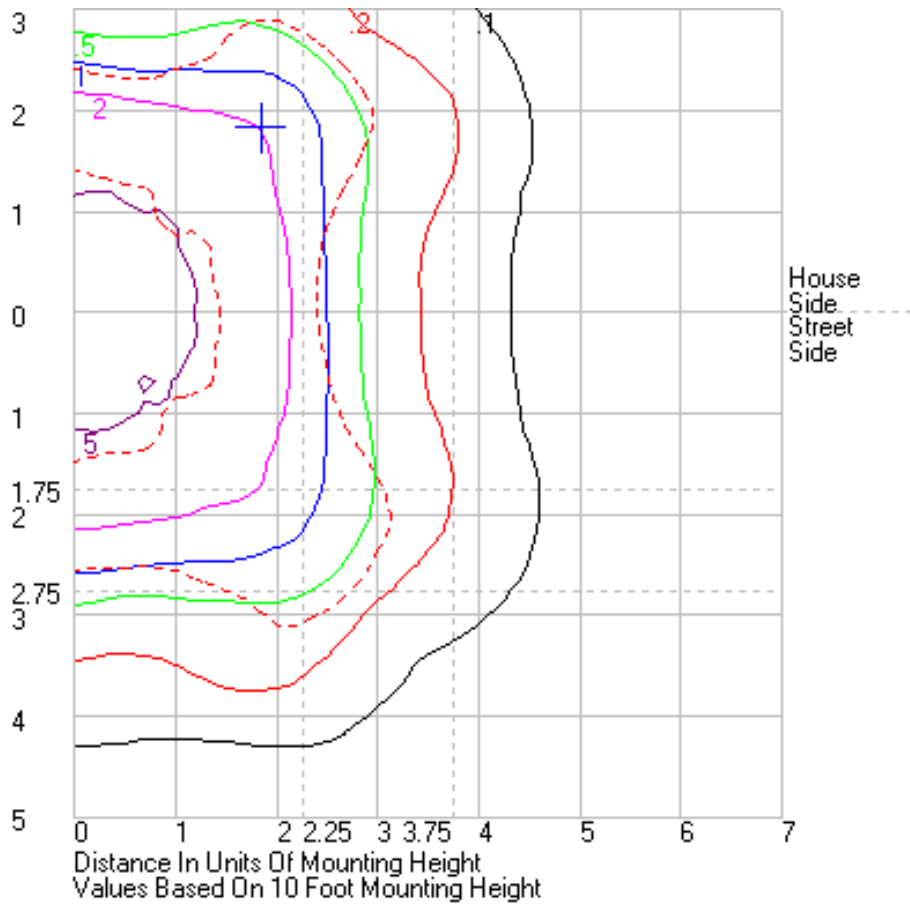


Table--4 UNIT: cd

C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355
0	725	725	725	725	725	725	725	725	725	725	725	725	725	725	725
5	754	749	743	736	730	725	720	716	713	711	709	708	708	709	711
10	813	813	814	816	815	814	813	812	811	808	801	795	789	789	792
15	894	888	886	886	896	907	915	911	904	894	882	872	865	866	873
20	971	985	1001	1015	1019	1020	1017	1014	1008	1000	986	972	960	953	950
25	1121	1112	1100	1088	1081	1076	1076	1083	1094	1112	1147	1178	1195	1176	1134
30	983	1025	1075	1129	1197	1255	1290	1257	1202	1138	1091	1049	1012	983	960
35	1076	1070	1064	1066	1107	1150	1184	1172	1147	1118	1109	1102	1095	1083	1069
40	1317	1328	1334	1322	1232	1140	1072	1120	1192	1265	1260	1245	1234	1264	1313
45	1697	1675	1638	1581	1459	1343	1263	1320	1417	1529	1605	1666	1710	1726	1720
50	1914	1886	1841	1789	1751	1721	1704	1713	1735	1765	1805	1840	1865	1859	1835
55	2127	2059	1991	1951	2055	2172	2259	2166	2042	1926	1933	1969	2015	2031	2040
60	2591	2507	2424	2356	2350	2358	2367	2327	2289	2271	2316	2388	2483	2587	2707
65	2950	3061	3147	3185	3036	2869	2744	2867	3035	3192	3192	3141	3051	2954	2831
70	2121	2345	2608	2901	3317	3678	3901	3687	3341	2949	2731	2537	2353	2143	1928
75	1094	1415	1793	2198	2653	3030	3255	3066	2719	2281	1852	1444	1099	919	845
80	1020	1228	1424	1563	1460	1307	1159	1210	1273	1299	1123	898	657	487	339
85	201	199	181	162	181	202	216	195	164	126	89.9	55.9	27.3	11.7	4.79
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table--4 UNIT: cd

C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355
0	725	725	725	725	725	725	725	725	725	725	725	725	725	725	725
5	754	749	743	736	730	725	720	716	713	711	709	708	708	709	711
10	813	813	814	816	815	814	813	812	811	808	801	795	789	789	792
15	894	888	886	886	896	907	915	911	904	894	882	872	865	866	873
20	971	985	1001	1015	1019	1020	1017	1014	1008	1000	986	972	960	953	950
25	1121	1112	1100	1088	1081	1076	1076	1083	1094	1112	1147	1178	1195	1176	1134
30	983	1025	1075	1129	1197	1255	1290	1257	1202	1138	1091	1049	1012	983	960
35	1076	1070	1064	1066	1107	1150	1184	1172	1147	1118	1109	1102	1095	1083	1069
40	1317	1328	1334	1322	1232	1140	1072	1120	1192	1265	1260	1245	1234	1264	1313
45	1697	1675	1638	1581	1459	1343	1263	1320	1417	1529	1605	1666	1710	1726	1720
50	1914	1886	1841	1789	1751	1721	1704	1713	1735	1765	1805	1840	1865	1859	1835
55	2127	2059	1991	1951	2055	2172	2259	2166	2042	1926	1933	1969	2015	2031	2040
60	2591	2507	2424	2356	2350	2358	2367	2327	2289	2271	2316	2388	2483	2587	2707
65	2950	3061	3147	3185	3036	2869	2744	2867	3035	3192	3192	3141	3051	2954	2831
70	2121	2345	2608	2901	3317	3678	3901	3687	3341	2949	2731	2537	2353	2143	1928
75	1094	1415	1793	2198	2653	3030	3255	3066	2719	2281	1852	1444	1099	919	845
80	1020	1228	1424	1563	1460	1307	1159	1210	1273	1299	1123	898	657	487	339
85	201	199	181	162	181	202	216	195	164	126	89.9	55.9	27.3	11.7	4.79
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2020-11-12	2021-11-11
NTC-F01-006	2.0 meter Integrating Sphere	2020-11-12	2021-11-11
NTC-F01-012	Standard Lamp	2020-11-12	2021-11-11
NTC-F01-013	Standard Lamp	2020-11-12	2021-11-11
NTC-F01-031	Digital Power Meter	2020-08-22	2021-08-21
NTC-F01-019	Temperature & Humidity Meter	2020-11-13	2021-11-12

*****End of Report*****