

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

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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		9578.0
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	Standard	Premium	146.5
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		65.4
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	5.78
		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	5029±283	4969
		4 steps	5029±220	4969
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		-26
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		74
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		95
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%
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		65.4
(Goniophotometer – Section 4.2)		Non-Worst Case		63.9

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Goniophotometer Test	N/A	ALED5S78/D10	N/A

Remark (If any)

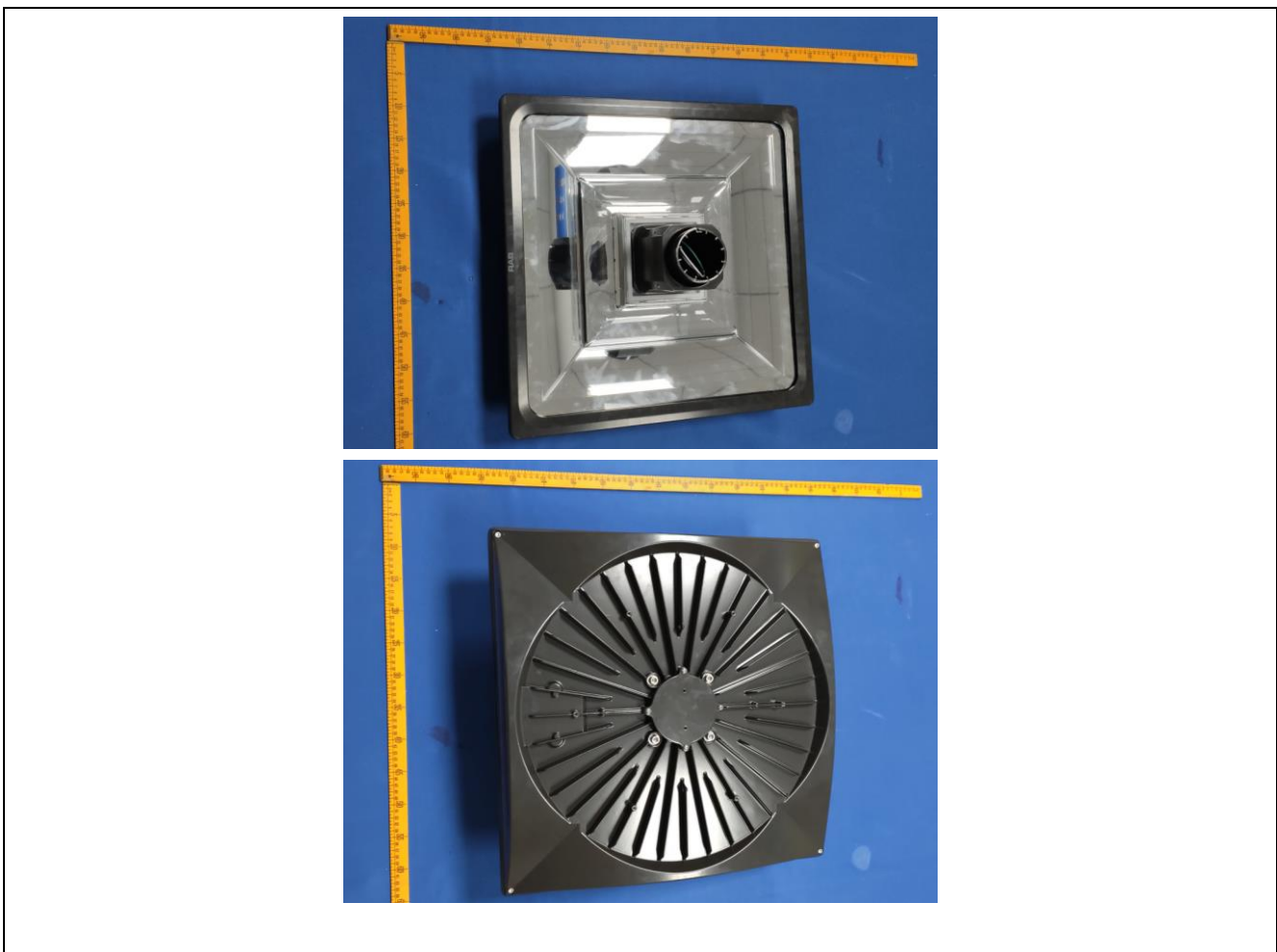
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency 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. ALED5S78/D10, 5000K

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

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Goniophotometer Test

Model No.	ALED5S78/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	65.4	0.995
NON-WORST CASE	277.0	60	0.254	63.9	0.916

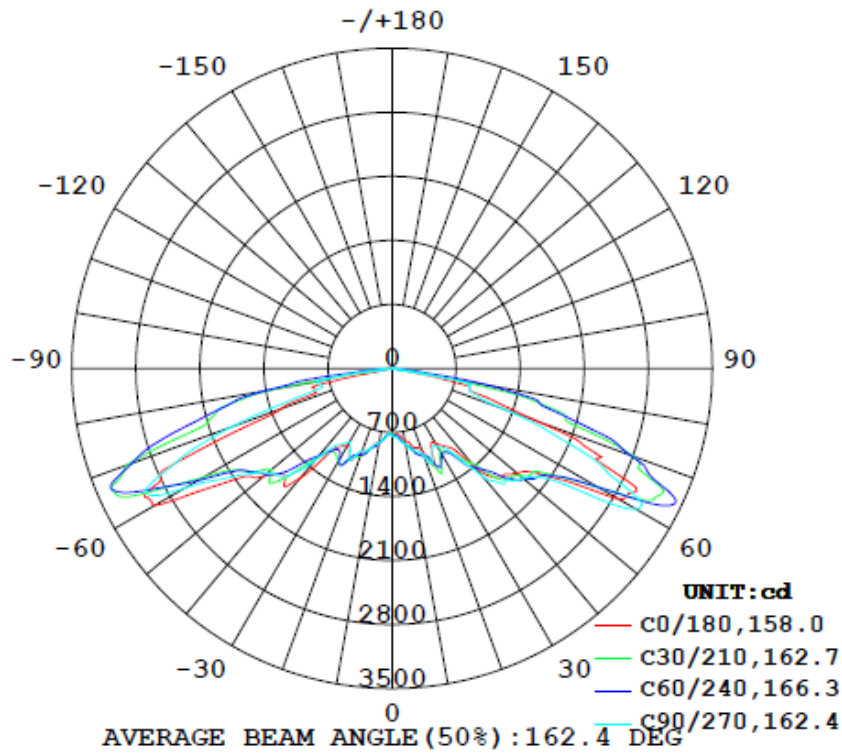
Test Result

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	9578.0	143.6	164.8	108.1	144.7	146.5	100.0%	2.2%	B3-U1-G2

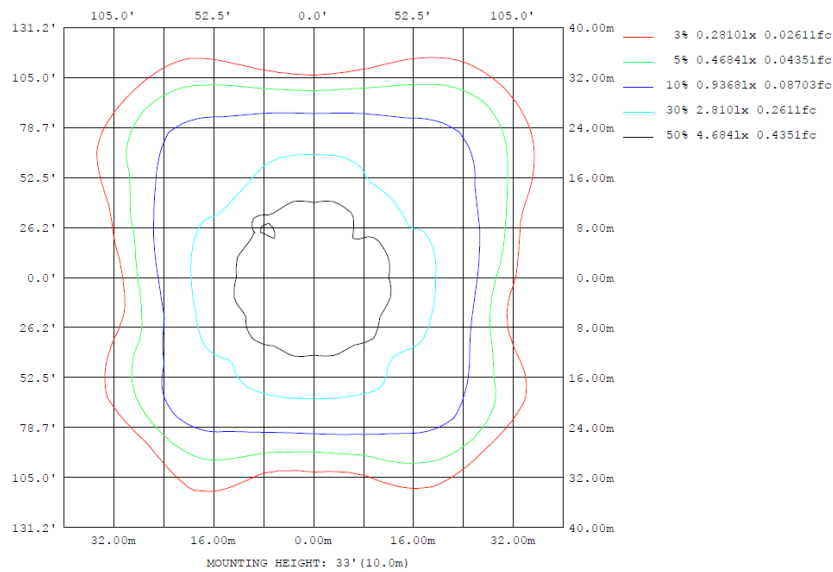
4.1 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.1 Goniophotometer Test

Zonal Lumen Summary

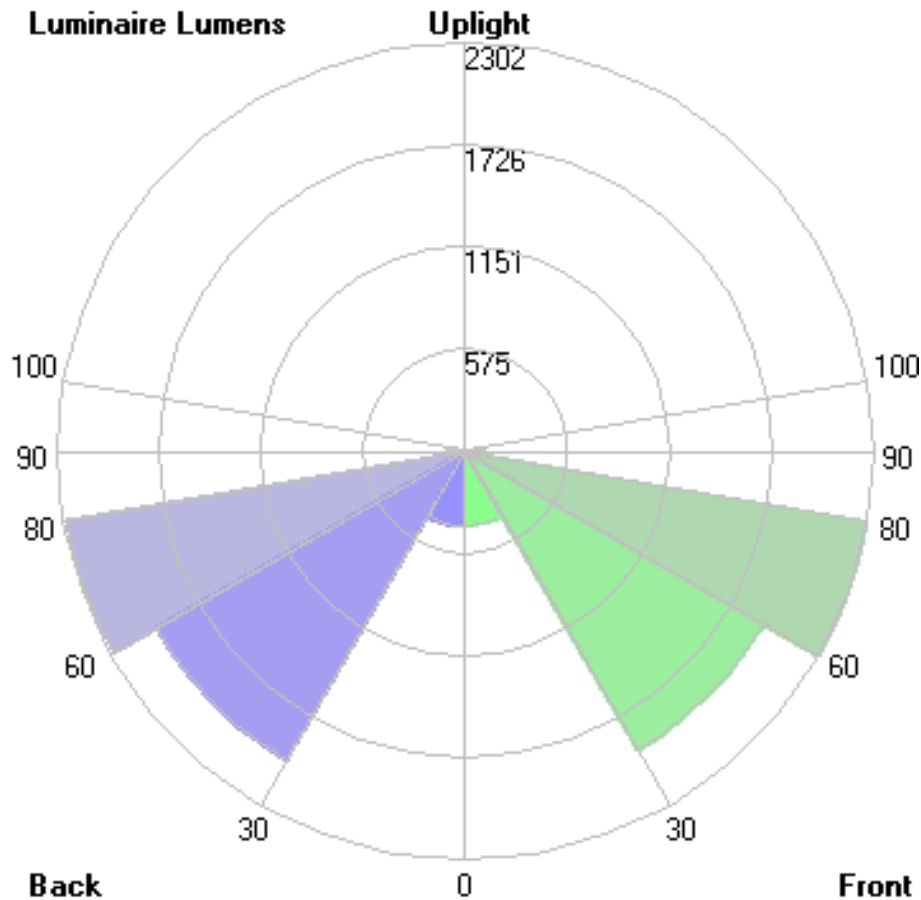
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	807.2	846.5	841.8	871.8	815.8	843.9	827.0	805.9	0- 10	74.37	74.37	0.78, 0.78
20	951.8	1067	1018	1082	971.3	1024	962.0	1003	10- 20	262.4	336.8	3.52, 3.52
30	941.6	1440	986.8	1363	972.9	1208	932.3	1259	20- 30	504.8	841.6	8.79, 8.79
40	1391	1135	1532	1161	1562	1076	1307	1056	30- 40	727.8	1569	16.4, 16.4
50	1785	1997	1867	2167	1834	1821	1777	1634	40- 50	1271	2840	29.7, 29.7
60	2850	2412	3078	2531	2999	2413	2614	2362	50- 60	1948	4788	50, 50
70	1696	4119	1292	4056	1293	4141	1869	3852	60- 70	2846	7635	79.7, 79.7
80	210.8	1149	421.2	1170	18.48	1189	831.5	1175	70- 80	1730	9365	97.8, 97.8
90	0	0.5956	0.9113	0.5893	0	0	0.0000	0	80- 90	213.1	9578	100, 100
100	0	0	0	0	0	0	0	0	90-100	0.0149	9578	100, 100
110	0	0	0	0	0	0	0	0	100-110	0	9578	100, 100
120	0	0	0	0	0	0	0	0	110-120	0	9578	100, 100
130	0	0	0	0	0	0	0	0	120-130	0	9578	100, 100
140	0	0	0	0	0	0	0	0	130-140	0	9578	100, 100
150	0	0	0	0	0	0	0	0	140-150	0	9578	100, 100
160	0	0	0	0	0	0	0	0	150-160	0	9578	100, 100
170	0	0	0	0	0	0	0	0	160-170	0	9578	100, 100
180	0	0	0	0	0	0	0	0	170-180	0	9578	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	74.37	0-10	74.37	0.78%
10-20	262.41	0-20	336.78	3.52%
20-30	504.79	0-30	841.57	8.79%
30-40	727.78	0-40	1569.35	16.38%
40-50	1271.11	0-50	2840.46	29.66%
50-60	1947.90	0-60	4788.36	49.99%
60-70	2846.38	0-70	7634.74	79.71%
70-80	1730.10	0-80	9364.84	97.77%
80-90	213.14	0-90	9577.98	100.00%
90-100	0.01	0-100	9577.99	100.00%
100-110	0.00	0-110	9577.99	100.00%
110-120	0.00	0-120	9577.99	100.00%
120-130	0.00	0-130	9577.99	100.00%
130-140	0.00	0-140	9577.99	100.00%
140-150	0.00	0-150	9577.99	100.00%
150-160	0.00	0-160	9577.99	100.00%
160-170	0.00	0-170	9577.99	100.00%
170-180	0.00	0-180	9577.99	100.00%

4.1 Goniophotometer Test

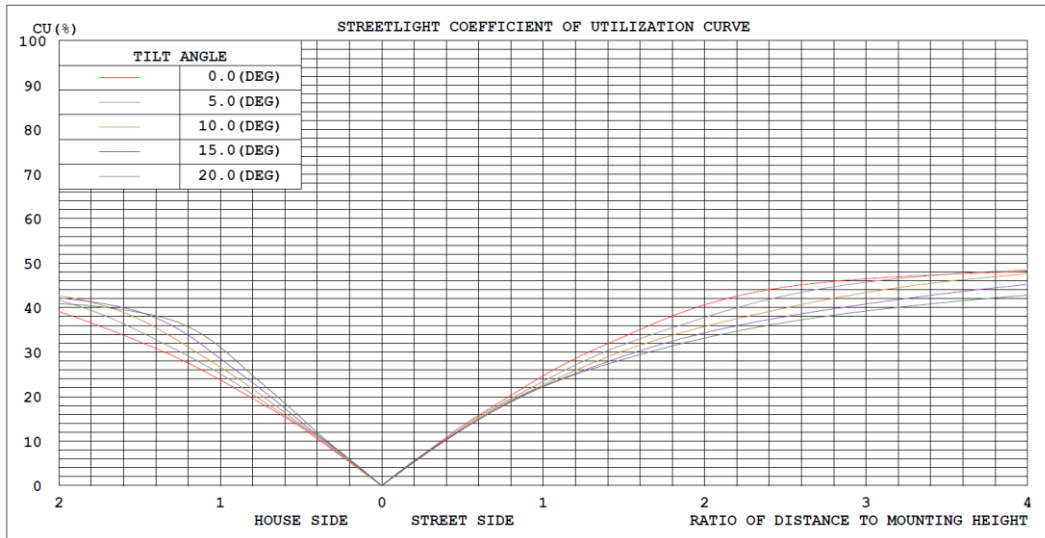
LCS/BUG



LCS Zone	Lumens	%Lamp	%Lum
FL (0-30)	417.7	N.A.	4.4
FM (30-60)	1942.2	N.A.	20.3
FH (60-80)	2301.6	N.A.	24.0
FVH (80-90)	114.3	N.A.	1.2
BL (0-30)	423.9	N.A.	4.4
BM (30-60)	2004.6	N.A.	20.9
BH (60-80)	2274.9	N.A.	23.8
BVH (80-90)	98.8	N.A.	1.0
UL (90-100)	< 0.05	N.A.	0.0
UH (100-180)	0.0	N.A.	0.0
Total	9578.0	N.A.	100.0
BUG Rating	B3-U1-G2		

4.1 Goniophotometer Test

Coefficients of Utilization



Isolines

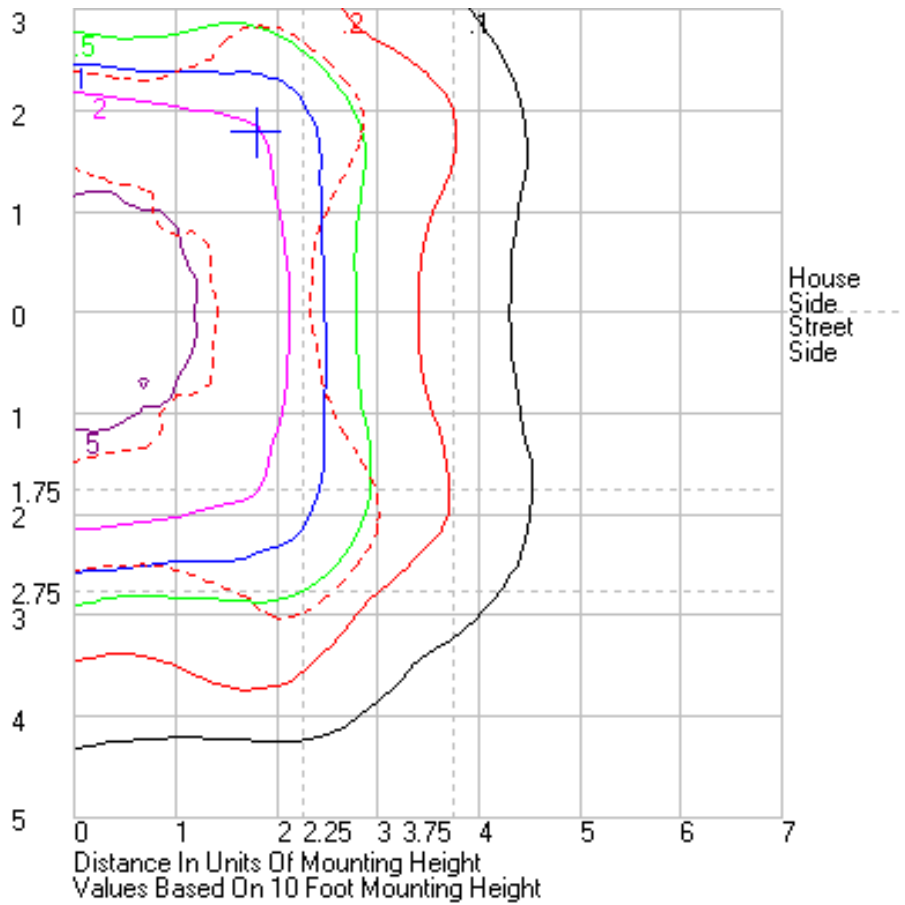


Table--4 UNIT: °C

C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355
0	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730
5	744	739	733	727	722	717	713	710	707	706	705	705	707	711	717
10	807	805	804	805	805	806	806	805	803	800	793	787	783	787	795
15	877	873	872	876	888	901	911	907	898	887	874	863	857	862	875
20	964	978	994	1007	1009	1007	1003	1003	1001	996	982	967	954	948	948
25	1116	1102	1087	1073	1069	1069	1073	1075	1082	1095	1136	1173	1194	1173	1124
30	983	1034	1092	1150	1202	1240	1259	1234	1192	1140	1092	1046	1005	976	955
35	1066	1058	1054	1059	1116	1174	1219	1193	1151	1107	1097	1093	1091	1080	1066
40	1274	1290	1300	1293	1208	1120	1056	1110	1188	1264	1255	1235	1222	1255	1311
45	1666	1643	1605	1549	1430	1318	1242	1302	1402	1517	1596	1661	1707	1724	1717
50	1902	1875	1830	1774	1714	1665	1634	1663	1710	1765	1807	1841	1860	1854	1829
55	2098	2035	1973	1937	2042	2158	2244	2151	2027	1911	1921	1961	2011	2028	2038
60	2489	2411	2337	2281	2301	2334	2362	2314	2265	2234	2281	2359	2463	2575	2704
65	3018	3086	3129	3128	2969	2803	2686	2822	3004	3174	3181	3132	3044	2947	2824
70	2237	2443	2681	2946	3325	3651	3852	3653	3331	2965	2754	2562	2374	2157	1932
75	1161	1491	1876	2285	2751	3135	3361	3153	2781	2318	1871	1447	1093	909	837
80	1028	1247	1457	1607	1495	1331	1175	1240	1320	1360	1181	946	693	511	351
85	296	307	295	273	278	280	273	238	193	144	101	61.6	29.7	11.8	4.08
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: °C

C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355
0	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730
5	744	739	733	727	722	717	713	710	707	706	705	705	707	711	717
10	807	805	804	805	805	806	806	805	803	800	793	787	783	787	795
15	877	873	872	876	888	901	911	907	898	887	874	863	857	862	875
20	964	978	994	1007	1009	1007	1003	1003	1001	996	982	967	954	948	948
25	1116	1102	1087	1073	1069	1069	1073	1075	1082	1095	1136	1173	1194	1173	1124
30	983	1034	1092	1150	1202	1240	1259	1234	1192	1140	1092	1046	1005	976	955
35	1066	1058	1054	1059	1116	1174	1219	1193	1151	1107	1097	1093	1091	1080	1066
40	1274	1290	1300	1293	1208	1120	1056	1110	1188	1264	1255	1235	1222	1255	1311
45	1666	1643	1605	1549	1430	1318	1242	1302	1402	1517	1596	1661	1707	1724	1717
50	1902	1875	1830	1774	1714	1665	1634	1663	1710	1765	1807	1841	1860	1854	1829
55	2098	2035	1973	1937	2042	2158	2244	2151	2027	1911	1921	1961	2011	2028	2038
60	2489	2411	2337	2281	2301	2334	2362	2314	2265	2234	2281	2359	2463	2575	2704
65	3018	3086	3129	3128	2969	2803	2686	2822	3004	3174	3181	3132	3044	2947	2824
70	2237	2443	2681	2946	3325	3651	3852	3653	3331	2965	2754	2562	2374	2157	1932
75	1161	1491	1876	2285	2751	3135	3361	3153	2781	2318	1871	1447	1093	909	837
80	1028	1247	1457	1607	1495	1331	1175	1240	1320	1360	1181	946	693	511	351
85	296	307	295	273	278	280	273	238	193	144	101	61.6	29.7	11.8	4.08
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*******