

# Photometric Test Report

## Relevant Standards

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

## Prepared For RAB Lighting Inc.

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## Test Date

2021/2/6

## Issue Date

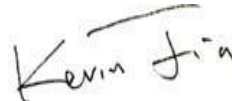
2021/3/16

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### Approved By



Kevin Jia

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## 1.0 Test Summary

DLC Technical Requirements v5.1

Outdoor - Pole/Arm-Mounted Decorative Luminaires				
Requirement Category	Test Method	Requirements	Test value	
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	1000	7020	
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	135.0
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case	52.0	
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	7.07%	
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	0.890	
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3985±275	3833
		4 step	3985±154	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥70	70	
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥-40	-32	
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70	72	
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥89	94	
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	≥65%	100.00%	
Input Voltage (V) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case	480	
Input Current (A) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case	0.122	

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/2/6	ALED5T52N/480/D10	G1
2	Goniophotometer Test	2021/2/6	ALED5T52N/480/D10	G1
3	THD and PF Test	2021/2/6	ALED5T52N/480/D10	G1

### Remark(If any)

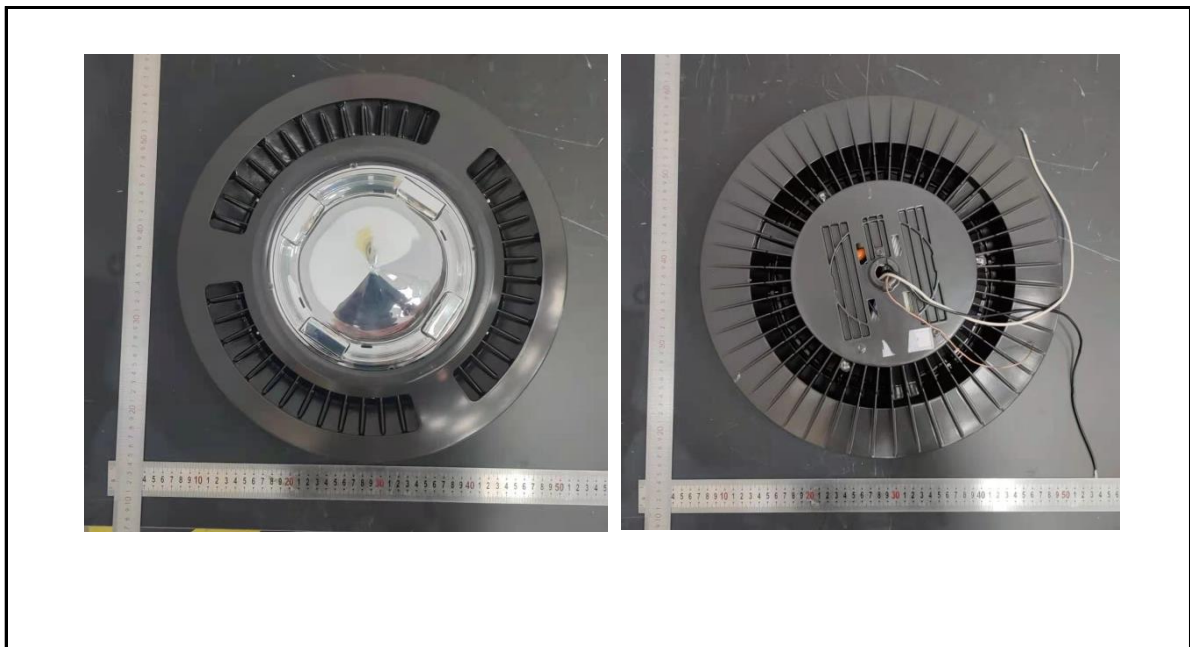
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## 3.0 Production Description

**Luminaire Description:** ALED5T52N/480/D10

**Electrical Specification:** 480V,50/60HZ

### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

Model No.	ALED5T52N/480/D10	Sample ID.	G1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

#### Test Method

The samples were tested according to the IES LM-79-2008.

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 sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

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.

The sample was measured using 4π geometry and 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.

#### Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
480.00	60	0.122	52.0	0.890

#### Test Result

CCT (K)	CRI	R9	Duv
3833	70	-32	0.0038

Rf	Rg	IES Rcs,h1
72	94	-17%

## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

Model No.	ALED5T52N/480/D10	Sample ID.	G1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

#### Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , measured at a point not more than 1 m from the sample and at the same height as the sample.

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  $\pm 0.2$  percent under load.

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  $0.5^{\circ}$  vertical intervals and  $10^{\circ}$  horizontal intervals.

#### Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	480.00	60	0.122	52.0	0.890

#### Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
7020	174.7	175.0	168.9	169.8	135.0

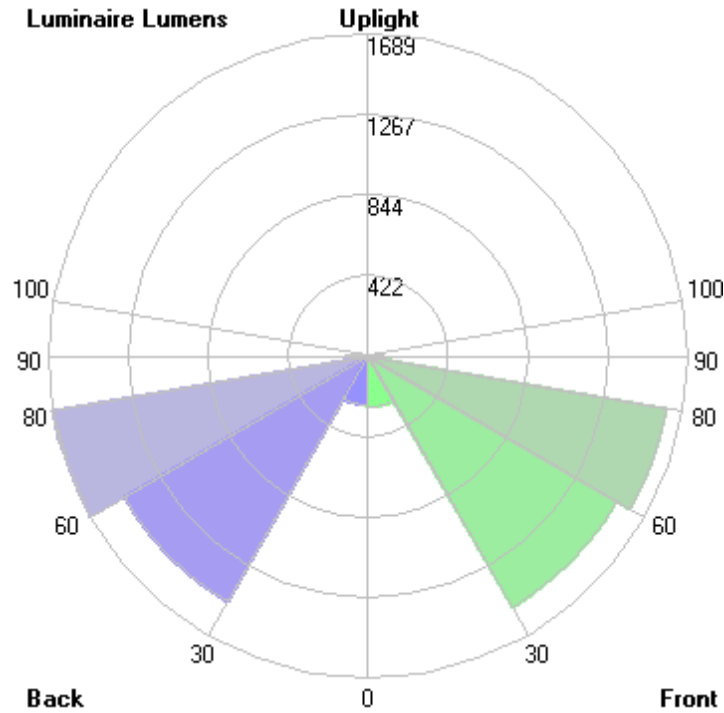
Zonal Lumen Requirement (0°-90°)	BUG rating
100.00%	B3-U0-G2

#### 4.2 Goniophotometer Test

	Zonal (lm)		Total (lm)	Percent
0-10	19.87	0 - 10	19.87	0.28%
10-20	150.23	0 - 20	170.10	2.42%
20-30	361.43	0 - 30	531.53	7.57%
30-40	597.15	0 - 40	1128.68	16.08%
40-50	952.78	0 - 50	2081.46	29.65%
50-60	1455.75	0 - 60	3537.21	50.38%
60-70	1878.72	0 - 70	5415.93	77.14%
70-80	1409.61	0 - 80	6825.54	97.22%
80-90	194.94	0 - 90	7020.48	100.00%
90-100	0.00	0 - 100	7020.48	100.00%
100-110	0.00	0 - 110	7020.48	100.00%
110-120	0.00	0 - 120	7020.48	100.00%
120-130	0.00	0 - 130	7020.48	100.00%
130-140	0.00	0 - 140	7020.48	100.00%
140-150	0.00	0 - 150	7020.48	100.00%
150-160	0.00	0 - 160	7020.48	100.00%
160-170	0.00	0 - 170	7020.48	100.00%
170-180	0.00	0 - 180	7020.48	100.00%

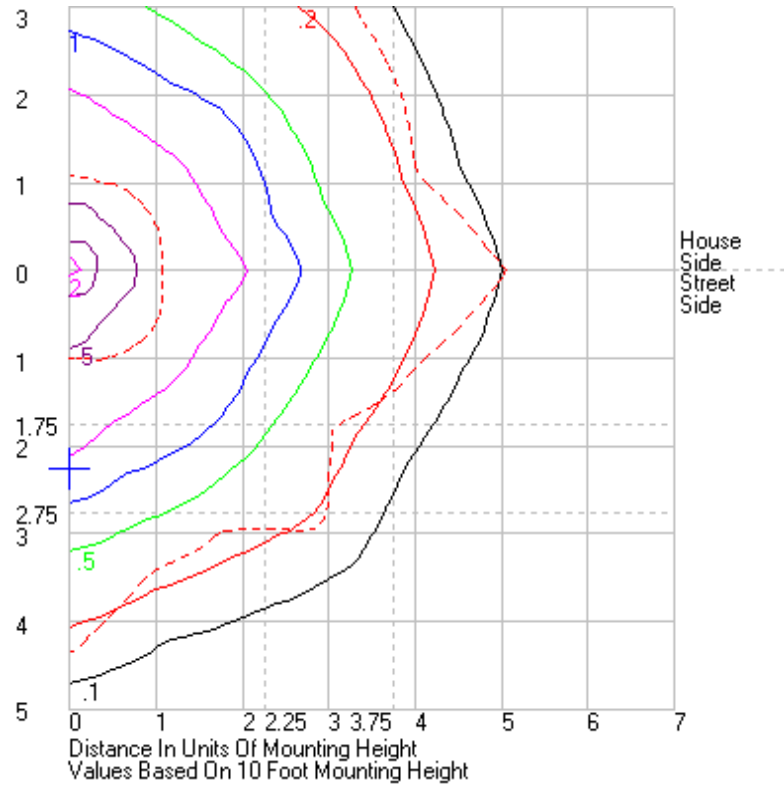
## 4.2 Goniophotometer Test

LCS/BUG



	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	271.9	N.A.	3.9
FM - Front-Medium (30-60)	1519.4	N.A.	21.6
FH - Front-High (60-80)	1599.5	N.A.	22.8
FVH - Front-Very High (80-90)	78.5	N.A.	1.1
BL - Back-Low (0-30)	259.6	N.A.	3.7
BM - Back-Medium (30-60)	1486.3	N.A.	21.2
BH - Back-High (60-80)	1688.9	N.A.	24.1
BVH - Back-Very High (80-90)	116.5	N.A.	1.7
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
<b>Total</b>	<b>7020.6</b>	<b>N.A.</b>	<b>100.0</b>
<b>BUG Rating</b>	<b>B3-U0-G2</b>		

Isolines





NVLAP LAB CODE 201074-0

Vert. Angles	Horizontal Angles										
	0	15	30	45	60	75	90	105	120	135	
0	136.904	136.904	136.904	136.904	136.904	136.904	136.904	136.904	136.904	136.904	
1	147.410	146.171	144.715	143.444	142.575	141.304	139.740	137.133	134.916	133.917	
2	156.285	153.884	151.125	148.040	145.791	143.173	141.163	139.218	134.992	132.570	
3	165.574	165.921	164.487	159.588	155.134	150.484	141.782	137.002	133.982	130.310	
4	176.144	175.460	173.689	167.888	167.399	158.263	147.899	142.521	139.859	137.730	
5	184.088	183.369	179.794	175.080	180.153	166.454	160.739	155.612	151.364	147.627	
6	192.929	188.116	186.041	185.107	190.191	174.536	174.884	169.463	161.022	160.794	
7	205.596	196.329	196.644	201.163	202.891	184.770	184.803	179.001	171.440	175.721	
8	239.832	219.871	217.578	225.672	220.794	199.132	193.928	191.842	189.539	194.341	
9	285.879	263.608	255.743	256.655	244.944	220.131	207.692	210.495	212.646	214.167	
10	338.513	327.573	306.367	305.672	279.078	258.698	240.620	244.086	249.876	242.630	
11	392.223	394.440	356.373	346.715	318.861	314.526	300.784	305.444	291.615	282.217	
12	441.675	463.554	410.757	397.047	361.045	367.747	354.081	361.762	328.388	325.998	
13	486.238	514.190	468.943	453.310	418.872	418.253	407.693	416.265	383.598	385.683	
14	529.215	551.616	512.832	493.049	462.044	457.732	460.567	462.164	430.974	439.437	
15	572.170	581.632	543.033	534.831	503.805	490.388	500.491	494.201	468.497	479.752	
16	611.160	596.733	558.699	578.427	534.017	515.483	549.910	533.669	511.333	510.953	
17	644.283	605.576	576.917	616.385	563.435	539.548	590.421	554.027	547.053	550.030	
18	671.595	616.841	614.017	645.141	590.052	567.879	633.170	569.334	584.913	601.415	
19	701.730	626.347	642.730	641.698	626.271	594.701	662.360	573.137	597.537	638.721	
20	718.471	648.933	657.135	646.804	664.175	619.503	681.241	585.011	625.304	648.748	
21	731.671	668.889	673.930	670.584	688.010	640.905	680.905	611.268	670.573	648.096	
22	754.202	694.636	695.028	691.356	700.351	667.130	681.763	647.325	702.469	668.444	
23	758.243	720.536	715.062	713.865	707.673	699.775	688.064	684.468	730.943	694.517	
24	769.270	758.667	739.840	731.160	717.700	725.272	695.375	715.723	745.750	724.620	
25	790.954	799.775	762.469	736.516	743.795	748.694	712.594	736.994	761.676	747.401	
26	816.560	846.370	778.678	746.793	770.128	787.369	741.111	761.959	780.188	761.709	
27	842.546	880.428	793.094	768.216	788.749	826.218	767.771	794.648	797.907	769.824	
28	868.630	904.567	807.652	802.948	804.501	854.474	792.040	835.332	816.440	783.523	
29	894.713	933.986	815.973	847.033	816.810	876.919	815.332	882.763	831.878	824.360	
30	943.318	968.217	844.849	908.358	832.910	903.600	841.590	925.642	847.239	867.098	
31	974.985	979.548	880.764	949.108	853.008	935.105	881.177	961.221	862.122	933.660	
32	971.889	990.586	878.983	938.429	863.122	946.609	919.852	967.185	892.562	966.881	
33	968.836	1005.545	863.969	912.769	845.772	954.703	928.065	961.851	902.676	980.558	
34	967.011	1013.747	853.029	882.253	835.778	961.460	940.232	963.557	882.687	955.811	
35	976.952	997.299	854.387	869.825	837.244	976.028	950.596	994.757	883.915	921.449	
36	988.435	991.672	868.738	874.431	841.937	969.467	959.646	995.865	890.487	894.127	
37	1008.141	1000.526	901.427	891.117	862.948	961.775	971.976	980.993	898.863	883.122	
38	1036.561	1020.330	961.819	924.556	897.951	974.301	982.047	981.971	911.835	896.202	
39	1100.233	1041.004	1009.315	948.619	955.311	999.277	996.506	988.261	946.696	932.237	
40	1150.130	1081.928	1038.516	962.438	994.453	1021.232	1041.254	1004.459	995.398	967.967	
41	1175.388	1138.310	1045.675	997.062	1027.414	1056.561	1096.018	1032.324	1039.049	1004.187	
42	1198.061	1188.023	1072.422	1024.632	1046.403	1101.515	1131.140	1073.248	1069.250	1031.574	
43	1229.663	1233.400	1086.447	1056.507	1072.900	1144.763	1156.062	1123.090	1081.776	1075.105	
44	1264.373	1259.452	1124.253	1104.611	1083.210	1192.955	1187.175	1176.073	1116.811	1105.372	
45	1308.056	1284.112	1161.613	1144.492	1125.643	1224.546	1222.689	1230.402	1134.823	1153.530	
46	1354.183	1303.493	1214.508	1203.112	1159.462	1248.751	1249.381	1260.592	1182.211	1203.058	
47	1402.787	1324.319	1264.373	1237.778	1215.693	1272.977	1292.477	1298.898	1231.391	1246.643	
48	1459.637	1345.145	1305.590	1288.621	1259.995	1300.712	1338.409	1326.307	1275.074	1297.073	
49	1514.010	1383.765	1351.511	1318.083	1295.769	1335.259	1384.341	1353.401	1325.449	1338.094	
50	1583.201	1429.143	1391.782	1347.480	1334.009	1369.794	1441.180	1383.070	1375.748	1379.104	
51	1655.043	1498.649	1418.431	1370.218	1366.079	1421.516	1497.139	1422.527	1430.012	1415.150	
52	1713.316	1555.727	1451.305	1408.817	1395.878	1455.400	1569.958	1475.227	1468.274	1447.687	
53	1778.672	1594.543	1483.679	1425.710	1421.147	1493.412	1645.320	1516.878	1498.247	1470.501	
54	1837.314	1629.513	1501.680	1427.328	1458.985	1527.894	1700.605	1575.064	1520.420	1519.724	
55	1853.360	1640.572	1513.206	1448.969	1471.153	1557.552	1766.124	1620.702	1564.993	1529.545	
56	1881.366	1648.753	1512.902	1467.079	1491.283	1593.880	1791.404	1643.549	1575.249	1534.510	

57	1951.600	1665.385	1520.083	1513.445	1506.284	1643.125	1838.346	1671.805	1575.520	1578.009
58	2031.774	1696.097	1538.236	1547.698	1515.846	1675.760	1881.497	1698.988	1595.466	1613.272
59	2121.487	1734.076	1567.470	1584.657	1546.482	1715.869	1937.662	1711.773	1610.903	1672.555
60	2205.148	1752.392	1575.173	1626.960	1566.482	1765.722	2013.143	1748.069	1645.254	1680.181
61	2313.199	1772.110	1587.633	1677.509	1575.890	1779.280	2109.689	1784.288	1665.798	1714.402
62	2407.583	1780.160	1597.498	1725.537	1578.671	1762.007	2229.277	1790.470	1671.957	1782.767
63	2459.837	1790.687	1615.390	1790.752	1582.842	1771.121	2338.109	1789.340	1694.217	1839.802
64	2500.674	1807.254	1653.098	1792.078	1613.293	1773.240	2391.168	1798.704	1720.388	1903.865
65	2573.982	1835.000	1718.443	1833.273	1629.339	1778.183	2430.407	1797.466	1782.648	1943.528
66	2612.831	1813.599	1780.182	1912.111	1667.069	1788.688	2425.486	1787.363	1881.312	2033.404
67	2568.724	1764.505	1765.722	1843.170	1707.797	1802.811	2394.112	1779.497	1924.365	2087.016
68	2475.546	1734.685	1715.412	1752.957	1640.442	1830.720	2384.530	1779.095	1952.808	2104.290
69	2351.135	1685.613	1655.423	1669.698	1583.625	1787.406	2354.513	1748.807	1889.905	1968.298
70	2176.881	1625.428	1610.958	1580.496	1522.473	1760.714	2312.319	1722.028	1756.151	1828.710
71	2020.737	1572.142	1540.311	1512.478	1497.932	1703.701	2208.614	1672.729	1657.802	1733.120
72	1905.245	1526.329	1464.374	1461.919	1435.889	1655.499	2112.687	1631.273	1623.310	1631.794
73	1827.298	1469.806	1391.858	1443.744	1386.068	1595.434	1986.799	1577.997	1564.363	1597.780
74	1753.913	1359.930	1285.188	1452.717	1320.419	1553.304	1879.943	1531.305	1528.557	1580.920
75	1637.704	1190.391	1193.998	1405.449	1238.680	1493.228	1814.478	1469.773	1476.845	1522.994
76	1478.268	1030.216	1094.530	1350.022	1141.070	1383.374	1728.764	1372.966	1425.014	1450.859
77	1319.930	912.628	980.482	1238.485	1017.441	1223.438	1618.943	1237.757	1324.590	1354.346
78	1109.782	784.273	892.313	1092.237	857.559	1075.518	1443.754	1059.668	1133.389	1253.183
79	888.021	656.950	780.405	980.472	755.017	955.518	1271.782	915.398	996.800	1131.836
80	624.272	518.090	648.726	811.345	658.830	811.791	1052.063	781.839	848.858	989.000
81	409.486	378.981	508.454	664.435	558.080	670.606	834.876	662.534	723.045	850.118
82	194.754	235.840	367.595	508.900	457.406	513.115	630.073	548.454	616.168	696.559
83	82.934	113.080	223.445	353.299	334.439	355.395	451.724	401.523	478.242	537.927
84	53.102	59.826	102.510	214.232	201.967	214.167	273.407	253.831	339.752	367.726
85	35.025	36.811	50.169	102.695	88.409	104.074	124.172	125.671	177.198	196.177
86	16.958	13.395	29.919	58.349	43.520	53.873	73.851	53.069	68.746	87.236
87	7.876	6.855	9.669	36.263	22.520	32.406	49.756	33.189	45.791	47.681
88	4.400	3.987	5.345	14.188	8.311	10.940	26.725	14.275	23.683	32.146
89	0.967	1.195	2.488	5.008	5.410	5.856	10.614	7.605	9.147	19.457
90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
91	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
92	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
93	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
94	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
95	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
97	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
98	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
99	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
103	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
106	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
108	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
109	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
110	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
111	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
112	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
115	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
116	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000





NVLAP LAB CODE 201074-0

177	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
178	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
179	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**Vert. Angles**      **Horizontal Angles**

	150	165	180	195	210	225	240	255	270	285
0	136.904	136.904	136.904	136.904	136.904	136.904	136.904	136.904	136.904	136.904
1	134.058	135.373	136.057	137.035	138.273	140.033	140.403	141.543	142.000	141.869
2	134.536	140.316	142.108	142.782	143.423	146.226	149.452	151.245	150.517	149.800
3	135.112	140.870	148.833	153.363	153.884	156.155	160.251	162.489	161.858	160.001
4	142.347	147.040	153.613	160.642	163.857	164.140	169.148	172.657	172.820	171.429
5	151.266	158.534	159.392	163.727	173.917	173.113	178.905	180.044	181.858	182.434
6	162.445	168.355	168.432	167.736	186.552	187.377	184.848	187.486	192.299	198.426
7	171.831	175.775	174.439	178.469	200.903	202.695	198.187	200.153	209.311	222.739
8	183.977	181.609	183.162	191.603	217.339	223.195	221.239	228.116	248.410	265.118
9	202.967	195.427	197.198	213.070	243.369	256.460	263.293	278.480	298.405	323.217
10	235.590	231.354	222.663	249.583	282.858	296.775	314.613	339.100	360.208	378.687
11	283.141	282.391	267.714	297.122	330.126	350.930	368.334	408.291	428.704	424.434
12	334.287	342.348	328.649	358.611	372.430	400.132	409.616	461.023	462.392	461.816
13	382.272	405.521	385.390	417.297	425.455	457.156	452.008	504.391	503.142	507.379
14	441.034	454.016	452.528	461.849	487.313	513.647	505.293	524.478	534.082	534.006
15	481.273	517.634	508.324	514.592	530.312	542.392	543.522	553.615	586.738	555.288
16	524.761	560.589	545.119	565.152	560.654	574.125	559.861	593.897	638.113	570.725
17	545.108	586.217	578.829	580.687	587.651	597.732	590.117	616.896	647.032	577.428
18	552.550	602.653	605.967	598.482	616.429	616.602	615.386	621.643	636.364	599.025
19	564.891	601.806	633.115	618.493	645.283	635.473	640.622	635.266	656.863	622.056
20	604.565	601.534	660.622	628.172	672.344	658.232	662.360	648.466	683.577	654.625
21	641.263	620.024	679.210	637.852	687.173	666.749	678.200	665.826	716.896	691.171
22	681.872	646.260	699.558	656.081	699.612	712.551	697.722	712.790	749.324	722.567
23	720.503	672.855	718.907	692.377	714.093	737.353	719.710	754.050	771.204	744.925
24	737.689	699.971	736.440	731.540	733.713	755.202	746.174	804.382	785.164	775.213
25	756.657	730.530	755.245	762.328	756.462	760.959	783.317	839.287	800.004	807.315
26	773.681	768.836	778.798	784.751	785.750	767.901	816.690	875.885	821.438	853.498
27	796.679	818.222	794.637	811.128	810.846	787.825	842.046	906.685	842.187	890.835
28	814.507	868.065	809.737	832.703	825.794	813.420	854.257	915.029	870.618	927.783
29	830.943	914.474	832.138	863.795	836.506	854.268	854.420	924.143	904.534	953.453
30	853.442	953.975	863.774	889.618	857.407	893.106	852.953	946.935	928.391	969.771
31	859.971	975.409	901.395	911.172	859.721	932.443	850.563	962.655	962.210	967.098
32	884.990	984.774	932.454	923.176	875.832	990.890	854.670	967.370	977.071	978.388
33	912.693	993.345	958.092	936.202	910.618	977.821	875.354	961.612	960.797	992.237
34	900.004	994.562	967.392	928.293	896.984	941.232	860.536	950.260	981.362	985.404
35	886.088	1000.385	972.780	928.956	892.291	917.429	849.683	958.777	969.119	970.803
36	892.139	1026.697	973.236	955.398	894.138	894.811	858.353	1001.069	1007.935	976.854
37	896.843	1018.712	980.624	944.415	890.563	874.941	880.808	1031.759	1034.269	998.755
38	918.027	1013.258	998.788	953.052	894.246	894.616	907.717	1035.246	1063.036	1022.188
39	952.780	1034.301	1007.685	976.039	923.404	935.550	951.400	1053.117	1082.514	1058.625
40	997.636	1055.583	1024.556	1001.732	976.832	993.747	1002.275	1076.681	1093.193	1099.473
41	1045.860	1072.194	1065.154	1019.516	1039.722	1028.565	1066.164	1097.626	1123.166	1147.523
42	1081.102	1103.731	1132.596	1057.017	1065.882	1053.204	1106.284	1127.153	1169.989	1212.901
43	1103.329	1141.167	1165.328	1097.463	1078.734	1080.744	1130.890	1168.120	1222.580	1254.867
44	1134.052	1191.705	1182.786	1152.281	1098.191	1105.654	1155.214	1218.148	1244.818	1292.054
45	1166.165	1227.990	1202.254	1203.677	1123.644	1136.148	1185.448	1277.409	1276.964	1311.152
46	1203.884	1280.169	1233.618	1237.235	1158.224	1185.665	1217.170	1343.080	1322.189	1341.277
47	1256.779	1315.899	1266.719	1262.276	1213.857	1230.272	1268.208	1386.959	1371.989	1376.867
48	1299.604	1351.369	1308.251	1304.699	1261.548	1288.414	1306.372	1421.962	1413.760	1413.032
49	1343.004	1381.668	1356.823	1333.770	1318.985	1324.514	1358.855	1448.285	1485.634	1471.044
50	1386.394	1424.699	1419.561	1370.642	1365.568	1371.163	1395.443	1476.965	1550.784	1529.893
51	1430.359	1474.455	1486.460	1410.555	1412.380	1408.067	1438.801	1504.504	1635.488	1573.934

52	1476.585	1551.566	1562.288	1460.191	1455.498	1455.183	1481.549	1543.809	1709.209	1615.032
53	1512.304	1596.715	1645.700	1505.754	1502.114	1478.290	1514.347	1580.289	1766.385	1653.891
54	1525.406	1620.181	1716.825	1556.498	1515.846	1519.485	1534.140	1632.131	1844.495	1689.937
55	1558.367	1680.149	1784.549	1598.106	1550.718	1536.704	1572.120	1699.910	1929.004	1723.864
56	1584.993	1702.626	1858.183	1626.819	1570.784	1553.749	1586.058	1729.568	2019.781	1734.207
57	1589.839	1720.029	1906.092	1634.282	1587.959	1599.160	1577.519	1766.613	2096.968	1737.390
58	1604.592	1739.019	1953.045	1653.174	1579.790	1623.907	1598.747	1826.342	2171.851	1759.117
59	1618.530	1777.998	2023.453	1681.528	1595.988	1676.303	1606.102	1861.399	2253.992	1759.074
60	1646.004	1819.454	2136.262	1697.205	1640.051	1691.621	1622.930	1876.489	2335.241	1757.737
61	1669.926	1857.412	2234.198	1720.051	1648.611	1732.468	1630.741	1895.174	2398.816	1772.273
62	1691.577	1877.347	2302.009	1738.194	1678.465	1826.733	1651.447	1915.185	2434.058	1785.679
63	1715.738	1897.727	2357.001	1758.803	1716.271	1852.176	1655.716	1940.769	2447.941	1787.895
64	1717.411	1929.384	2420.891	1761.833	1734.978	1906.505	1647.395	1976.065	2480.565	1796.890
65	1730.078	1956.304	2426.735	1767.862	1806.211	1970.503	1702.756	2025.050	2484.824	1837.303
66	1808.308	1993.078	2437.219	1807.374	1897.955	2050.514	1769.177	2017.662	2467.181	1801.801
67	1816.673	2028.070	2443.965	1771.610	1888.212	2053.610	1711.523	1975.153	2466.768	1746.167
68	1802.572	2016.674	2480.522	1754.000	1872.078	1883.539	1661.767	1915.468	2454.666	1704.972
69	1765.537	1986.440	2463.585	1750.850	1793.598	1795.065	1613.815	1885.864	2408.821	1666.211
70	1692.718	1926.527	2455.785	1711.154	1688.905	1809.025	1556.487	1832.241	2288.008	1604.016
71	1627.514	1858.976	2387.659	1684.494	1661.018	1796.208	1503.950	1788.753	2160.520	1566.101
72	1576.487	1811.991	2236.056	1633.446	1594.152	1736.075	1441.288	1749.340	1988.863	1520.083
73	1513.847	1769.796	2100.954	1553.825	1513.771	1626.493	1364.601	1663.321	1825.288	1412.762
74	1441.354	1743.158	1973.273	1493.945	1445.417	1505.834	1269.305	1536.498	1677.531	1263.504
75	1353.227	1656.433	1832.143	1349.273	1360.278	1407.263	1172.020	1361.288	1505.297	1118.973
76	1250.576	1469.382	1681.322	1204.601	1256.355	1308.892	1013.410	1186.371	1332.391	957.234
77	1094.551	1278.604	1511.272	1067.653	1147.925	1209.163	859.548	1044.263	1158.191	816.028
78	932.671	1146.393	1333.846	922.318	1025.708	1027.012	735.538	884.827	926.446	675.429
79	804.968	987.696	1155.996	777.407	901.471	858.983	627.010	738.265	702.263	560.448
80	694.789	821.959	939.993	648.422	770.563	717.646	533.213	566.808	487.487	411.050
81	593.289	672.257	720.590	530.855	627.390	581.361	430.952	369.236	302.424	277.079
82	488.921	514.136	516.233	383.076	466.270	426.422	296.232	241.533	198.100	165.291
83	384.543	331.593	316.862	247.747	310.517	274.472	174.656	113.830	95.090	55.959
84	230.832	165.585	207.084	128.116	181.652	147.583	54.916	35.372	53.775	30.603
85	103.879	67.181	98.088	44.639	53.384	62.054	36.296	23.542	34.308	18.523
86	55.079	45.084	56.882	27.224	27.757	44.758	17.675	11.722	19.728	6.475
87	33.612	23.553	35.144	17.110	16.882	27.398	5.464	3.878	5.378	2.368
88	12.135	9.560	20.630	7.061	6.073	10.038	1.586	0.967	0.652	0.554
89	6.583	5.171	6.268	2.086	1.271	0.565	0.391	0.315	0.315	0.315
90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
91	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
92	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
93	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
94	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
95	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
97	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
98	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
99	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
103	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
106	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
108	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
109	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
110	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
111	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000





172	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
174	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
175	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
176	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
177	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
178	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
179	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**Vert. Angles**      **Horizontal Angles**

	<u>300</u>	<u>315</u>	<u>330</u>	<u>345</u>	<u>360</u>
0	136.904	136.904	136.904	136.904	136.904
1	142.445	143.314	144.227	144.650	147.410
2	150.060	152.429	153.819	154.656	156.285
3	161.467	162.706	162.988	162.923	165.574
4	175.492	177.491	174.623	170.669	176.144
5	189.561	194.373	187.030	181.826	184.086
6	209.724	212.842	203.923	193.906	192.929
7	239.632	241.555	228.181	212.364	205.596
8	281.012	282.141	261.870	247.562	239.632
9	331.865	321.979	317.840	301.099	285.879
10	370.442	366.161	363.630	365.129	338.513
11	425.629	432.473	411.104	416.917	392.223
12	470.029	487.944	462.957	467.704	441.675
13	499.807	522.284	506.314	522.110	486.238
14	534.603	554.744	548.563	559.394	529.215
15	567.140	591.431	568.498	581.295	572.170
16	589.128	622.490	586.553	588.943	611.160
17	613.398	635.375	612.691	593.756	644.283
18	637.656	642.045	638.819	613.224	671.595
19	667.901	648.531	670.519	632.681	701.730
20	696.016	661.068	703.393	652.409	718.471
21	718.156	686.804	727.651	674.245	731.671
22	737.472	716.918	742.871	698.884	754.202
23	756.842	739.601	755.919	729.444	758.243
24	778.102	754.626	780.199	758.950	769.270
25	797.570	772.518	812.312	802.274	790.954
26	812.595	798.200	840.275	855.191	816.560
27	835.104	837.538	865.479	898.657	842.546
28	860.710	882.850	870.357	933.377	868.630
29	879.689	953.790	863.067	963.274	894.713
30	905.012	989.271	882.394	970.162	943.318
31	909.434	977.288	901.938	959.852	974.985
32	895.908	946.685	891.519	949.782	971.889
33	903.741	916.680	872.443	964.926	968.836
34	907.685	893.464	877.538	988.739	967.011
35	914.181	885.783	885.827	1001.123	976.952
36	933.377	896.441	911.465	1004.839	988.435
37	968.315	939.200	949.010	1016.115	1008.141
38	1010.205	995.974	995.474	1034.247	1036.561
39	1061.699	1038.060	1052.639	1052.911	1100.233
40	1097.539	1068.880	1104.079	1086.643	1150.130
41	1124.970	1093.878	1136.518	1133.954	1175.388
42	1147.740	1118.647	1160.103	1180.777	1198.061
43	1171.608	1157.235	1182.776	1231.423	1229.663
44	1207.208	1209.370	1212.846	1295.063	1264.373
45	1257.952	1261.288	1257.203	1343.309	1308.056
46	1308.197	1316.551	1304.503	1372.814	1354.183

47	1366.307	1363.482	1350.533	1401.451	1402.787
48	1413.303	1404.037	1398.301	1433.282	1459.637
49	1456.617	1429.088	1437.942	1489.186	1514.010
50	1489.621	1458.855	1475.759	1539.051	1583.201
51	1522.277	1493.912	1507.231	1574.727	1655.043
52	1556.226	1534.901	1538.323	1611.012	1713.316
53	1597.585	1550.795	1581.246	1651.990	1778.672
54	1604.972	1565.069	1613.446	1703.017	1837.314
55	1609.622	1578.714	1618.182	1733.794	1853.360
56	1621.550	1618.247	1623.397	1756.966	1881.366
57	1642.191	1669.948	1620.268	1795.804	1951.600
58	1675.553	1700.475	1630.893	1838.096	2031.774
59	1693.761	1735.141	1648.220	1863.680	2121.487
60	1708.351	1798.791	1657.389	1867.537	2205.148
61	1720.551	1863.202	1675.912	1879.987	2313.199
62	1733.696	1933.143	1694.663	1884.289	2407.583
63	1814.880	1998.510	1727.036	1897.325	2459.837
64	1921.595	2091.503	1788.264	1920.324	2500.674
65	1978.564	2058.629	1808.960	1956.348	2573.982
66	1881.986	1934.164	1754.011	1979.553	2612.831
67	1821.681	1873.544	1692.783	1947.494	2568.724
68	1744.538	1772.392	1677.487	1905.495	2475.546
69	1701.985	1707.199	1618.356	1865.940	2351.135
70	1633.141	1684.462	1580.800	1790.350	2176.881
71	1600.561	1713.131	1513.369	1711.969	2020.737
72	1558.899	1682.278	1468.567	1668.883	1905.245
73	1497.812	1572.717	1362.679	1638.346	1827.298
74	1363.157	1431.815	1256.790	1500.876	1753.913
75	1228.512	1290.924	1101.515	1340.299	1637.704
76	1086.436	1156.670	926.805	1179.614	1478.268
77	938.668	1059.733	782.220	1009.391	1319.930
78	795.006	910.868	669.737	844.284	1109.782
79	662.339	723.979	579.068	694.799	868.021
80	528.509	566.423	479.600	521.502	624.272
81	341.870	389.084	327.997	339.904	409.486
82	208.561	257.144	202.119	208.181	194.754
83	75.687	125.193	77.274	77.534	82.934
84	36.665	39.544	37.730	35.307	53.102
85	22.260	24.389	23.009	23.824	35.025
86	7.898	14.742	8.365	12.352	16.958
87	2.553	5.171	3.672	4.443	7.876
88	0.543	0.663	0.826	1.304	4.400
89	0.304	0.304	0.315	0.391	0.967
90	0.000	0.000	0.000	0.000	0.000
91	0.000	0.000	0.000	0.000	0.000
92	0.000	0.000	0.000	0.000	0.000
93	0.000	0.000	0.000	0.000	0.000
94	0.000	0.000	0.000	0.000	0.000
95	0.000	0.000	0.000	0.000	0.000
96	0.000	0.000	0.000	0.000	0.000
97	0.000	0.000	0.000	0.000	0.000
98	0.000	0.000	0.000	0.000	0.000
99	0.000	0.000	0.000	0.000	0.000
100	0.000	0.000	0.000	0.000	0.000
101	0.000	0.000	0.000	0.000	0.000
102	0.000	0.000	0.000	0.000	0.000
103	0.000	0.000	0.000	0.000	0.000
104	0.000	0.000	0.000	0.000	0.000
105	0.000	0.000	0.000	0.000	0.000
106	0.000	0.000	0.000	0.000	0.000



107	0.000	0.000	0.000	0.000	0.000
108	0.000	0.000	0.000	0.000	0.000
109	0.000	0.000	0.000	0.000	0.000
110	0.000	0.000	0.000	0.000	0.000
111	0.000	0.000	0.000	0.000	0.000
112	0.000	0.000	0.000	0.000	0.000
113	0.000	0.000	0.000	0.000	0.000
114	0.000	0.000	0.000	0.000	0.000
115	0.000	0.000	0.000	0.000	0.000
116	0.000	0.000	0.000	0.000	0.000
117	0.000	0.000	0.000	0.000	0.000
118	0.000	0.000	0.000	0.000	0.000
119	0.000	0.000	0.000	0.000	0.000
120	0.000	0.000	0.000	0.000	0.000
121	0.000	0.000	0.000	0.000	0.000
122	0.000	0.000	0.000	0.000	0.000
123	0.000	0.000	0.000	0.000	0.000
124	0.000	0.000	0.000	0.000	0.000
125	0.000	0.000	0.000	0.000	0.000
126	0.000	0.000	0.000	0.000	0.000
127	0.000	0.000	0.000	0.000	0.000
128	0.000	0.000	0.000	0.000	0.000
129	0.000	0.000	0.000	0.000	0.000
130	0.000	0.000	0.000	0.000	0.000
131	0.000	0.000	0.000	0.000	0.000
132	0.000	0.000	0.000	0.000	0.000
133	0.000	0.000	0.000	0.000	0.000
134	0.000	0.000	0.000	0.000	0.000
135	0.000	0.000	0.000	0.000	0.000
136	0.000	0.000	0.000	0.000	0.000
137	0.000	0.000	0.000	0.000	0.000
138	0.000	0.000	0.000	0.000	0.000
139	0.000	0.000	0.000	0.000	0.000
140	0.000	0.000	0.000	0.000	0.000
141	0.000	0.000	0.000	0.000	0.000
142	0.000	0.000	0.000	0.000	0.000
143	0.000	0.000	0.000	0.000	0.000
144	0.000	0.000	0.000	0.000	0.000
145	0.000	0.000	0.000	0.000	0.000
146	0.000	0.000	0.000	0.000	0.000
147	0.000	0.000	0.000	0.000	0.000
148	0.000	0.000	0.000	0.000	0.000
149	0.000	0.000	0.000	0.000	0.000
150	0.000	0.000	0.000	0.000	0.000
151	0.000	0.000	0.000	0.000	0.000
152	0.000	0.000	0.000	0.000	0.000
153	0.000	0.000	0.000	0.000	0.000
154	0.000	0.000	0.000	0.000	0.000
155	0.000	0.000	0.000	0.000	0.000
156	0.000	0.000	0.000	0.000	0.000
157	0.000	0.000	0.000	0.000	0.000
158	0.000	0.000	0.000	0.000	0.000
159	0.000	0.000	0.000	0.000	0.000
160	0.000	0.000	0.000	0.000	0.000
161	0.000	0.000	0.000	0.000	0.000
162	0.000	0.000	0.000	0.000	0.000
163	0.000	0.000	0.000	0.000	0.000
164	0.000	0.000	0.000	0.000	0.000
165	0.000	0.000	0.000	0.000	0.000
166	0.000	0.000	0.000	0.000	0.000



167	0.000	0.000	0.000	0.000	0.000
168	0.000	0.000	0.000	0.000	0.000
169	0.000	0.000	0.000	0.000	0.000
170	0.000	0.000	0.000	0.000	0.000
171	0.000	0.000	0.000	0.000	0.000
172	0.000	0.000	0.000	0.000	0.000
173	0.000	0.000	0.000	0.000	0.000
174	0.000	0.000	0.000	0.000	0.000
175	0.000	0.000	0.000	0.000	0.000
176	0.000	0.000	0.000	0.000	0.000
177	0.000	0.000	0.000	0.000	0.000
178	0.000	0.000	0.000	0.000	0.000
179	0.000	0.000	0.000	0.000	0.000
180	0.000	0.000	0.000	0.000	0.000

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

Model No.	ALED5T52N/480/D1 0	Sample ID.	G1
Temperature (°C)	25.3	Humidity (%RH)	56.0

#### Test Method

The samples were tested according to the ANSI C82.77:2002.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at 25° C ± 1° C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

#### Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
480.00	60	0.122	52.0	0.890	7.07%

## 5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2020/12/26	2021/12/25
DLF108	Auxiliary Lamp	2020/12/26	2021/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF116	AC Power Source	2020/12/26	2021/12/25
DLF113	Power Meter	2020/12/26	2021/12/25
DLF112	Temperature Recorder	2020/12/26	2021/12/25
DLF114	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF101	Goniophotometer	2020/12/26	2021/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF104	AC Power Source	2020/12/26	2021/12/25
DLF507	DC Power Source	2020/12/26	2021/12/25
DLF102	Power Meter	2020/12/26	2021/12/25
DLF111	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF119	Power Meter	2020/12/26	2021/12/25
DLF031	Temperature data logger	2020/12/26	2021/12/25
DLF022	Digital power meter	2020/12/26	2021/12/25
DLF003	Temperature & Humidity Datalogger	2020/12/26	2021/12/25

\*\*\*\*\* End of Test Report\*\*\*\*\*