

Test Report for Luminous Intensity Distributions

Test Standard : CIE 70 (1987) 、 CIE 84 (1989)

Date of Receipt : 2018 / 03 / 06

Test Date : 2018 / 03 / 06 ~ 2018 / 03 / 13

1. Issue Date for test report : 2018 / 03 / 13
2. Report No : 18030602
3. Total pages : 20
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5. Test sample is not sampling by laboratory, test result relate only to the items tested.
6. Test report is not responsible for advertisement or promotion for products.

Approved Signatory:



毅豐光電股份有限公司
報告簽署人
黃錫偉

Test Report

Information for test items

Applicant : CoolLED Corp

Applicant address : 5F.-3, No.83, Sec. 2, Gongdao 5th Rd., East Dist., Hsinchu
City 30070, Taiwan, R.O.C.

Manufacturer : CoolLED Corp

Manufacturer address : 5F.-3, No.83, Sec. 2, Gongdao 5th Rd., East Dist.,
Hsinchu City 30070, Taiwan, R.O.C.

Product name : 21000lm LED High-bay

Trademark or brand name : CoolLED

Product model number : C3210C-601

Rated input voltage(V) : 100~277

Rated input frequency(Hz) : 50 / 60

Rated input power(W) : 165

Brand / model of controller : MEAN WELL / HBG-160-36A

LED brand / model / color temperature : Lumileds / LUXEON 3030 2D / 5000K

Outward appearance size : Φ 271 mm 、 H 341 mm

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Test Content

Test Condition

Temperature (°C)	24.8
Humidity (% RH)	57.1
γ Axis measurement of angles (°)	5
C Axis measurement of angles (°)	5

Electrical Test

Test item	Test Result
Voltage(V)	220.0
Frequency(Hz)	60
Current (A)	0.778
Watt (W)	166.7
Power factor (PF)	0.974

Luminosity Test

Test item	Test Result
Total luminous flux of luminaires (lm)	20914.0
Initial luminaires efficiency(lm/W)	125.5
Central intensity (cd)	19365.9
Max intensity (cd)	19387.1
Angle for max intensity (°)	C : 170.0 γ : 0.0
Beam Angle (50% I _{max})	C0_180 Left=29.6 Right=28.4
	C90_270 Left=30.4 Right=28.0
Color temperature(K)	5288
Chromaticity Coordinates	x : 0.3378 y : 0.3526
Rendering Index(Ra) / R9	82.2 / 11

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Diagram for luminous intensity distribution I

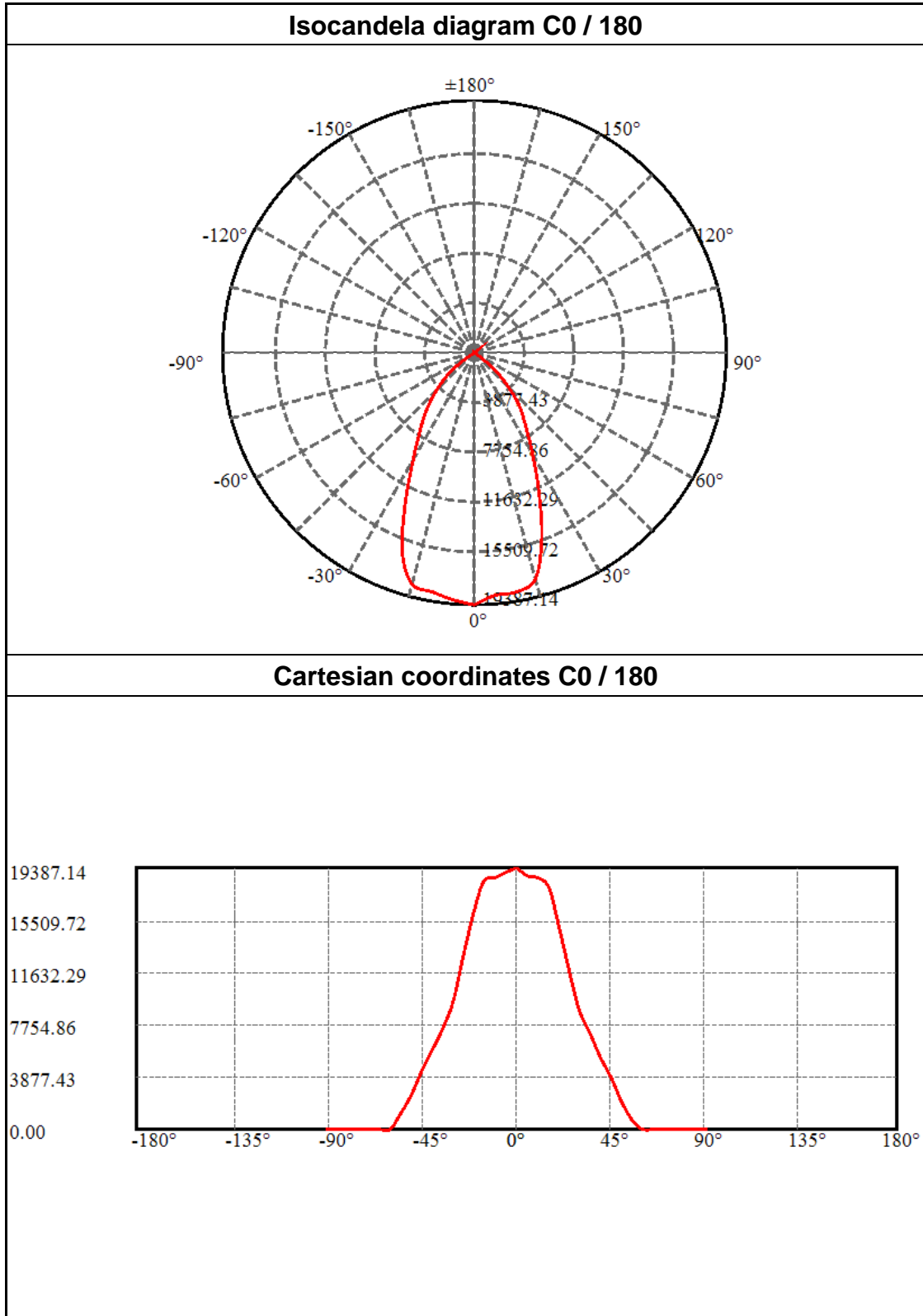


Diagram for luminous intensity distribution II

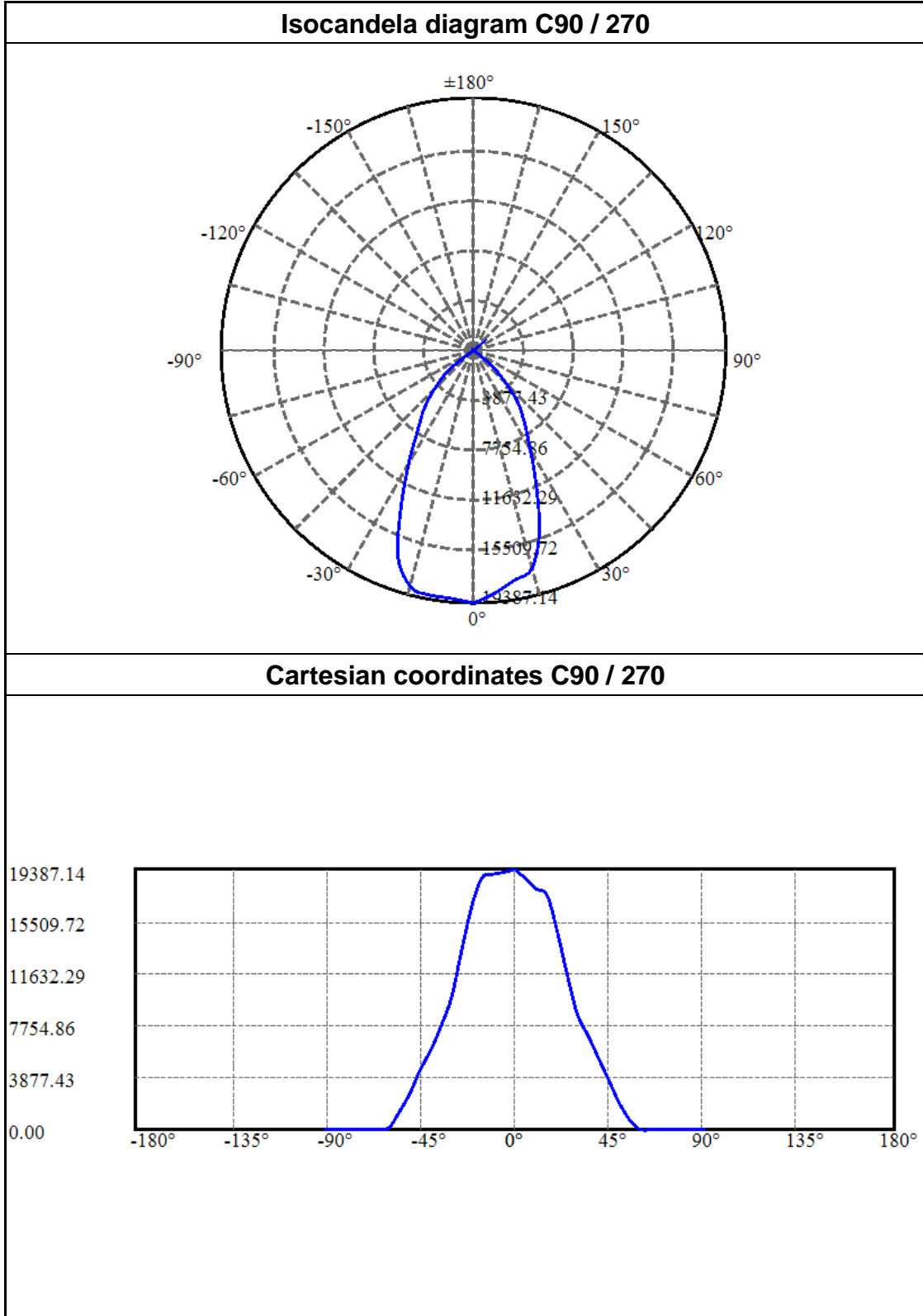
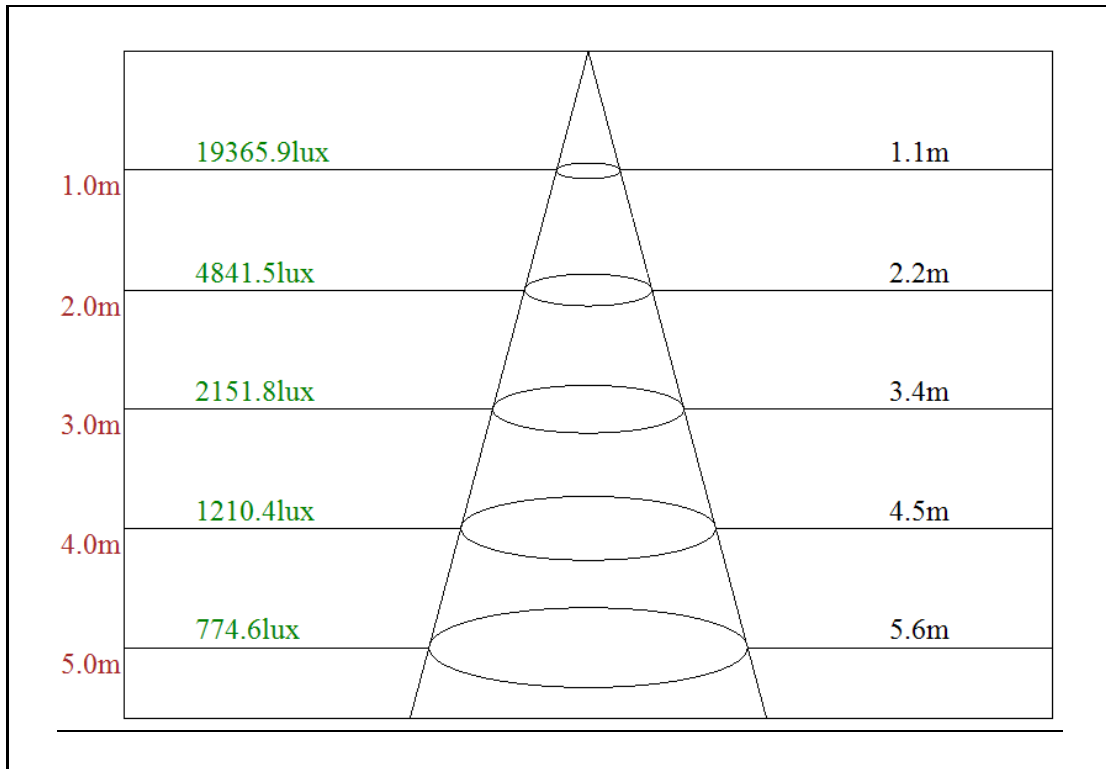


Diagram for illumination distance



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Test Results

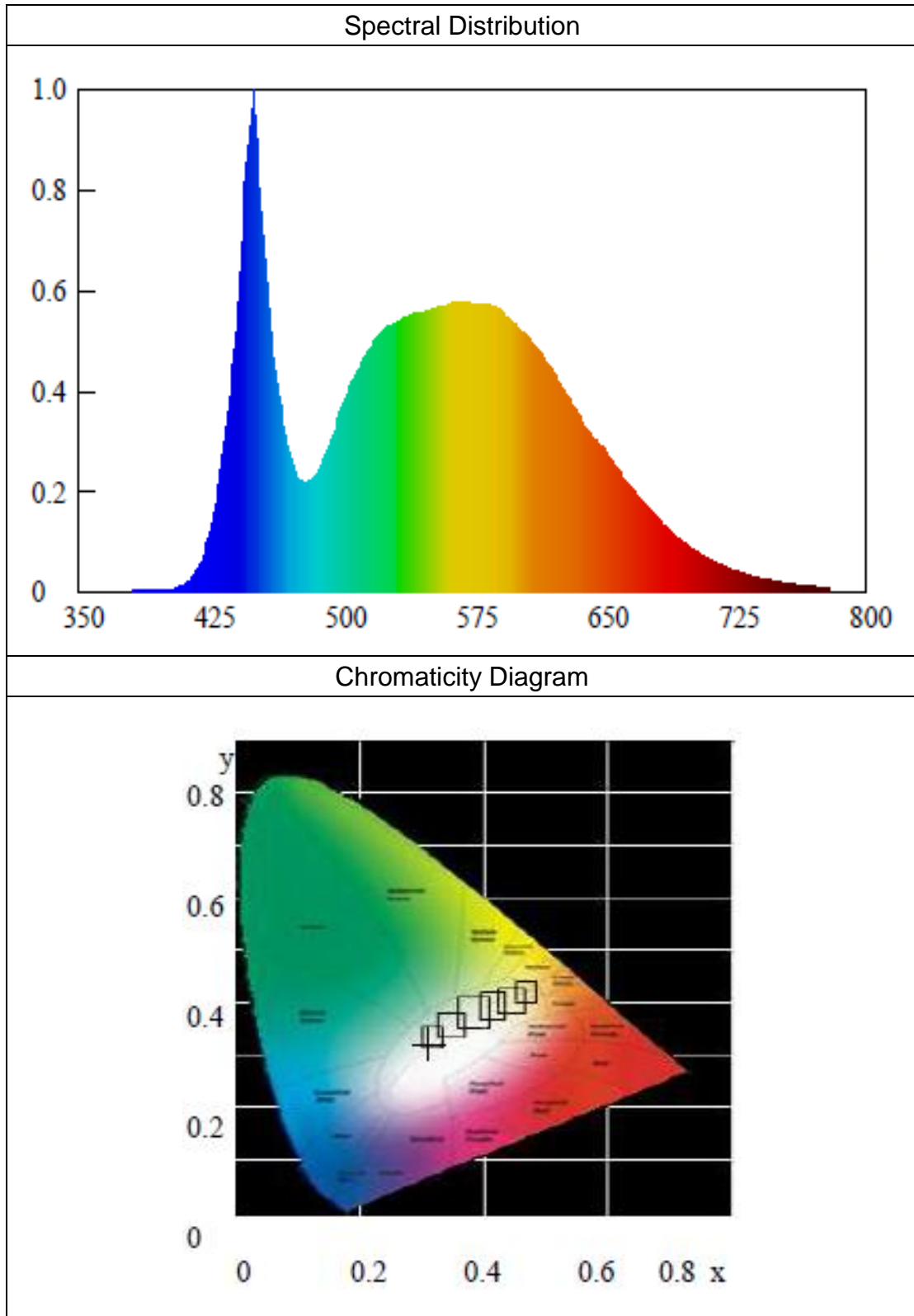


Photo for test items

The appearance of photo

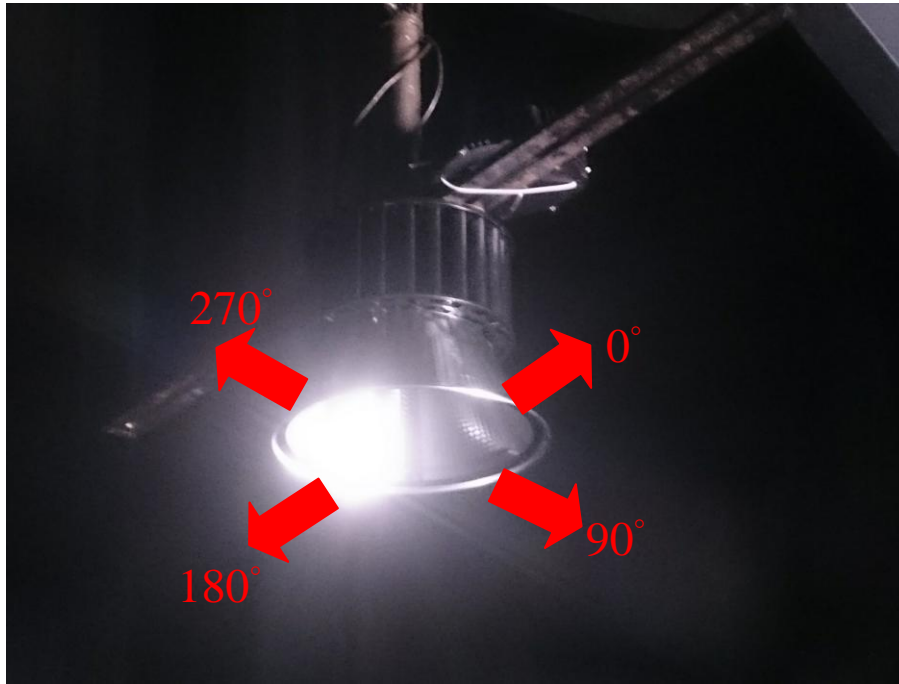


Photo of driver



Photo for test items

Direction for luminaire position in goniophotometer



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Data for luminous intensity (1)

Intensity data(cd)

$\gamma/C(^{\circ})$	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0
0	19365.92	19351.77	19323.46	19337.62	19323.46	19309.31	19337.62	19337.62
5	18764.49	18707.89	18814.02	18828.17	18672.51	18651.28	18799.87	18714.96
10	18651.28	18658.36	18580.53	18523.92	18424.86	18325.8	18226.75	18127.69
15	17964.95	17957.87	17880.04	17639.47	17526.26	17398.9	17342.29	17243.24
20	15170.09	15042.73	14993.2	14872.91	14830.46	14766.78	14717.25	14646.49
25	11589.83	11469.55	11420.02	11384.64	11398.79	11391.72	11299.73	11207.75
30	8780.819	8674.686	8603.93	8632.231	8674.686	8646.384	8582.703	8504.871
35	6983.617	6934.088	6898.71	6912.861	6912.861	6877.483	6842.105	6827.954
40	5327.927	5299.624	5278.397	5285.473	5292.549	5320.851	5271.322	5257.171
45	3680.02	3678.604	3663.038	3630.49	3595.112	3585.914	3585.207	3567.517
50	2096.5	2065.368	2063.953	2020.791	1980.46	1943.667	1923.856	1918.195
55	658.7383	628.3133	617.6999	609.2092	574.5387	543.4061	530.67	532.7927
60	23.42024	23.27872	22.9957	22.71268	22.57116	22.64192	22.64192	22.71268
65	11.03794	10.96718	10.96718	10.96718	11.03794	11.17945	11.39172	11.53323
70	5.3067	5.377456	5.377456	5.377456	5.448212	5.518968	5.731236	5.801992
75	2.47646	2.547216	2.547216	2.47646	2.547216	2.688728	2.617972	2.759484
80	0.990584	0.990584	0.990584	0.990584	1.06134	1.06134	1.06134	1.06134
85	0.283024	0.283024	0.283024	0.35378	0.35378	0.212268	0.283024	0.35378
90	0	0.070756	0	0	0.070756	0.070756	0.070756	0.212268

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Data for luminous intensity (2)

Intensity data(cd)		Page: 2 Total:10						
$\gamma/C(^{\circ})$	40.0	45.0	50.0	55.0	60.0	65.0	70.0	75.0
0	19351.77	19351.77	19358.84	19358.84	19365.92	19365.92	19365.92	19365.92
5	18531	18538.07	18722.04	18651.28	18439.01	18495.62	18651.28	18488.54
10	18056.93	17901.27	17802.21	17738.53	17745.61	17738.53	17703.15	17795.13
15	17144.18	17059.27	16924.84	16868.23	16769.17	16804.55	16854.08	16889.46
20	14512.06	14413	14292.71	14292.71	14391.77	14483.75	14575.74	14646.49
25	11052.09	10938.88	10896.42	10924.73	11016.71	11129.92	11271.43	11299.73
30	8419.964	8356.284	8342.133	8363.359	8427.039	8504.871	8561.477	8646.384
35	6806.727	6792.576	6764.274	6771.349	6813.803	6849.181	6877.483	6905.786
40	5207.642	5200.566	5214.717	5207.642	5207.642	5221.793	5235.944	5250.095
45	3566.81	3550.536	3538.508	3522.234	3502.422	3477.657	3466.336	3473.412
50	1947.913	1916.072	1933.761	1909.704	1926.686	1939.422	1964.894	1975.508
55	537.038	523.5944	527.1322	498.8298	505.1978	515.1036	516.5188	552.6044
60	23.13721	23.6325	24.05704	24.48158	25.11838	25.47216	25.96745	26.46274
65	11.81625	12.17003	12.45306	12.73608	13.0191	13.30213	13.5144	13.72666
70	5.943504	6.226528	6.36804	6.580308	6.72182	6.863332	7.0756	7.217112
75	2.83024	2.971752	3.042508	3.113264	3.18402	3.325532	3.396288	3.5378
80	1.06134	1.202852	1.132096	1.202852	1.273608	1.344364	1.344364	1.41512
85	0.283024	0.283024	0.283024	0.35378	0.35378	0.35378	0.283024	0.35378
90	0.070756	0	0.141512	0.070756	0	0	0.070756	0.070756

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Data for luminous intensity (3)

Intensity data(cd)		Page: 3 Total:10						
$\gamma/C(^{\circ})$	80.0	85.0	90.0	95.0	100.0	105.0	110.0	115.0
0	19351.77	19358.84	19358.84	19365.92	19365.92	19337.62	19351.77	19344.69
5	18375.33	18516.85	18665.43	18552.22	18467.32	18559.3	18622.98	18587.6
10	17858.81	17880.04	17964.95	18035.71	18120.61	18163.06	18205.52	18226.75
15	17045.12	17214.94	17413.05	17505.03	17512.11	17561.64	17490.88	17469.66
20	14766.78	14830.46	14964.89	15000.27	15056.88	15078.1	15071.03	15113.48
25	11335.11	11342.19	11342.19	11370.49	11391.72	11469.55	11582.76	11752.57
30	8646.384	8632.231	8589.778	8589.778	8618.081	8702.988	8823.273	8894.029
35	6934.088	6934.088	6905.786	6905.786	6948.239	6976.542	7026.071	7075.6
40	5292.549	5292.549	5285.473	5320.851	5292.549	5327.927	5384.532	5398.683
45	3474.827	3502.422	3529.309	3585.207	3595.82	3603.603	3608.556	3656.67
50	1930.224	1954.988	1952.866	1957.818	1979.045	2021.499	2044.141	2118.435
55	559.68	587.9824	622.6528	650.2477	697.6542	699.7769	702.6071	704.7297
60	26.74577	27.09955	27.09955	27.02879	26.81652	26.88728	27.02879	27.17031
65	13.79742	13.86818	13.86818	13.79742	13.65591	13.58515	13.5144	13.37288
70	7.217112	7.217112	7.217112	7.217112	7.146356	7.004844	7.004844	6.863332
75	3.5378	3.467044	3.467044	3.5378	3.467044	3.396288	3.325532	3.254776
80	1.41512	1.344364	1.41512	1.344364	1.41512	1.485876	1.344364	1.41512
85	0.283024	0.283024	0.35378	0.424536	0.35378	0.35378	0.35378	0.35378
90	0	0.070756	0.070756	0.070756	0.070756	0	0.070756	0.141512

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Data for luminous intensity (4)

Intensity data(cd)		Page: 4 Total:10						
$\gamma/C(^{\circ})$	120.0	125.0	130.0	135.0	140.0	145.0	150.0	155.0
0	19365.92	19351.77	19358.84	19351.77	19372.99	19337.62	19337.62	19358.84
5	18573.45	18573.45	18566.38	18608.83	18658.36	18651.28	18722.04	18792.79
10	18304.58	18325.8	18347.03	18431.94	18410.71	18474.39	18545.15	18559.3
15	17391.82	17547.49	17689	17880.04	18035.71	18056.93	18177.22	18219.67
20	15170.09	15240.84	15318.67	15431.88	15523.87	15672.45	15813.97	15891.8
25	11816.25	11865.78	11908.23	11950.69	12078.05	12191.26	12346.92	12403.53
30	8936.482	9007.238	9035.541	9063.844	9085.07	9162.901	9247.809	9311.489
35	7132.205	7160.507	7188.81	7167.583	7181.734	7202.961	7238.338	7287.868
40	5419.91	5434.061	5426.985	5441.136	5462.363	5497.741	5561.422	5603.875
45	3689.926	3763.511	3844.881	3873.891	3936.864	3972.949	4021.771	4035.922
50	2150.982	2167.256	2182.823	2230.229	2299.57	2314.429	2332.825	2388.015
55	693.4088	720.2961	772.6555	794.5899	819.3545	856.1476	901.4315	946.0078
60	27.09955	27.02879	27.02879	27.09955	27.31182	27.31182	27.52408	27.80711
65	13.16062	12.94835	13.0191	12.94835	12.87759	12.94835	13.08986	13.0191
70	6.863332	6.792576	6.651064	6.509552	6.651064	6.651064	6.651064	6.651064
75	3.325532	3.325532	3.254776	3.18402	3.18402	3.18402	3.18402	3.254776
80	1.41512	1.485876	1.41512	1.41512	1.41512	1.41512	1.344364	1.41512
85	0.35378	0.283024	0.35378	0.35378	0.35378	0.424536	0.495292	0.424536
90	0.141512	0.070756	0.070756	0	0	0.070756	0.141512	0.070756

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Data for luminous intensity (5)

Intensity data(cd)		Page: 5 Total:10						
$\gamma/C(^{\circ})$	160.0	165.0	170.0	175.0	180.0	185.0	190.0	195.0
0	19351.77	19358.84	19387.14	19380.07	19372.99	19365.92	19351.77	19351.77
5	18814.02	18856.47	19005.06	18997.99	19047.52	19125.35	19026.29	19054.59
10	18608.83	18679.58	18700.81	18714.96	18707.89	18792.79	18828.17	18863.55
15	18297.5	18375.33	18453.16	18474.39	18417.79	18417.79	18339.96	18311.65
20	16026.23	16104.07	16203.12	16252.65	16295.11	16309.26	16273.88	16295.11
25	12516.74	12566.27	12637.02	12693.63	12707.78	12707.78	12729	12778.53
30	9396.396	9403.473	9445.926	9467.153	9453.001	9481.304	9509.606	9552.06
35	7344.473	7351.549	7386.926	7379.851	7394.002	7365.7	7422.304	7478.909
40	5688.782	5738.312	5766.614	5830.294	5858.597	5929.353	5971.806	6000.108
45	4058.564	4086.866	4143.471	4175.312	4221.303	4262.341	4311.871	4349.371
50	2438.959	2467.969	2479.998	2465.846	2525.282	2547.216	2613.727	2636.369
55	983.5084	1033.745	1046.481	1076.199	1095.303	1100.256	1099.548	1129.973
60	28.23165	28.79769	29.4345	30.35432	31.41566	32.61852	35.73178	42.73663
65	13.08986	13.30213	13.23137	13.37288	13.5144	13.72666	13.93893	14.22196
70	6.72182	6.72182	6.792576	6.792576	6.863332	7.004844	7.0756	7.217112
75	3.254776	3.254776	3.254776	3.254776	3.325532	3.396288	3.396288	3.467044
80	1.344364	1.485876	1.485876	1.41512	1.41512	1.41512	1.41512	1.556632
85	0.424536	0.424536	0.495292	0.35378	0.495292	0.495292	0.495292	0.495292
90	0.141512	0.070756	0.141512	0.141512	0.070756	0.070756	0.070756	0.141512

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Data for luminous intensity (6)

Intensity data(cd)		Page: 6 Total:10						
$\gamma/C(^{\circ})$	200.0	205.0	210.0	215.0	220.0	225.0	230.0	235.0
0	19344.69	19351.77	19330.54	19330.54	19330.54	19344.69	19344.69	19358.84
5	19097.04	19097.04	19104.12	19047.52	18934.31	19012.14	19111.2	19189.03
10	18835.25	18729.11	18580.53	18417.79	18368.26	18417.79	18545.15	18714.96
15	18191.37	18148.91	18014.48	17908.34	17957.87	18049.86	18226.75	18495.62
20	16203.12	16196.05	16203.12	16231.43	16302.18	16457.85	16578.13	16691.34
25	12849.29	12983.73	13019.1	13012.03	12976.65	13033.25	13075.71	13210.15
30	9665.27	9728.95	9828.009	9828.009	9813.857	9813.857	9820.933	9820.933
35	7521.363	7592.119	7613.346	7655.799	7627.497	7613.346	7613.346	7627.497
40	6042.563	6042.563	6070.865	6092.091	6120.394	6141.621	6113.319	6106.243
45	4391.825	4417.297	4441.354	4489.468	4510.695	4522.724	4538.29	4528.384
50	2659.718	2695.803	2704.294	2725.521	2756.654	2757.361	2784.956	2765.145
55	1128.558	1128.558	1143.417	1162.521	1176.672	1226.909	1212.758	1241.768
60	53.63305	64.8125	72.66641	78.32689	83.98737	87.10063	87.73744	82.0062
65	14.50498	14.64649	15.00027	15.35405	15.77859	16.06161	16.41539	16.69842
70	7.358624	7.42938	7.641648	7.853916	8.066184	8.278452	8.49072	8.632232
75	3.5378	3.608556	3.679312	3.750068	3.820824	3.89158	4.103848	4.174604
80	1.485876	1.556632	1.627388	1.7689	1.698144	1.7689	1.839656	1.839656
85	0.495292	0.566048	0.566048	0.566048	0.566048	0.636804	0.566048	0.566048
90	0.070756	0.141512	0.141512	0	0.141512	0.141512	0.070756	0.070756

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Data for luminous intensity (7)

Intensity data(cd)		Page: 7 Total:10						
$\gamma/C(^{\circ})$	240.0	245.0	250.0	255.0	260.0	265.0	270.0	275.0
0	19344.69	19351.77	19344.69	19337.62	19337.62	19351.77	19351.77	19337.62
5	19203.18	19054.59	19047.52	19160.72	19238.56	19266.86	19132.42	19075.82
10	18898.93	18976.76	19075.82	19068.74	19026.29	19026.29	19033.36	19040.44
15	18608.83	18714.96	18771.57	18849.4	18821.1	18821.1	18799.87	18679.58
20	16790.4	16896.53	16967.29	16953.14	16995.59	16910.68	16882.38	16783.32
25	13231.37	13280.9	13323.35	13309.2	13295.05	13259.67	13203.07	13132.31
30	9884.613	9877.537	9870.462	9884.613	9898.765	9870.462	9835.084	9849.235
35	7641.648	7677.026	7669.951	7655.799	7662.875	7641.648	7641.648	7620.421
40	6113.319	6070.865	6056.714	6021.336	5985.958	5957.655	5943.504	5943.504
45	4512.817	4494.421	4480.978	4478.147	4426.496	4395.363	4375.551	4333.098
50	2770.805	2748.163	2746.04	2747.455	2726.229	2703.587	2695.803	2686.605
55	1244.598	1240.353	1242.475	1241.06	1262.995	1239.645	1226.909	1215.588
60	73.65699	63.53889	56.88782	55.47271	62.12377	67.35971	69.48239	59.85958
65	16.98144	17.19371	17.26446	17.33522	17.33522	17.12295	16.83993	16.41539
70	8.773745	8.915256	9.056767	9.056767	8.986012	8.915256	8.702988	8.49072
75	4.316116	4.316116	4.386872	4.457628	4.386872	4.316116	4.24536	4.103848
80	1.839656	1.910412	1.910412	1.981168	1.910412	1.839656	1.839656	1.7689
85	0.636804	0.636804	0.636804	0.636804	0.636804	0.566048	0.566048	0.566048
90	0.141512	0.070756	0	0.070756	0.070756	0.070756	0.070756	0.141512

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Data for luminous intensity (8)

Intensity data(cd)		Page: 8 Total:10							
$\gamma/C(^{\circ})$	280.0	285.0	290.0	295.0	300.0	305.0	310.0	315.0	
0	19337.62	19351.77	19337.62	19351.77	19372.99	19358.84	19337.62	19358.84	
5	19181.95	19224.4	19181.95	19047.52	18920.15	18806.95	18757.42	18686.66	
10	19040.44	19019.21	18941.38	18863.55	18736.19	18679.58	18509.77	18431.94	
15	18587.6	18495.62	18431.94	18304.58	18269.2	18283.35	18297.5	18240.9	
20	16684.27	16585.21	16535.68	16387.09	16394.17	16316.33	16295.11	16231.43	
25	13089.86	13104.01	13075.71	13040.33	12955.42	12813.91	12700.7	12637.02	
30	9813.857	9792.631	9799.706	9757.252	9736.025	9651.118	9559.136	9495.455	
35	7620.421	7613.346	7599.194	7577.968	7563.816	7514.287	7450.606	7386.926	
40	5922.277	5886.899	5837.37	5794.916	5766.614	5731.236	5674.631	5674.631	
45	4311.163	4242.53	4198.661	4137.104	4123.66	4069.177	4074.13	4059.272	
50	2673.162	2626.463	2583.302	2540.848	2505.47	2467.262	2424.808	2408.534	
55	1173.842	1146.247	1121.483	1077.614	1059.925	1050.019	1054.972	1003.32	
60	48.96315	41.53377	35.378	33.11381	31.55717	30.42508	29.50525	28.51467	
65	16.06161	15.56632	15.00027	14.50498	14.22196	13.72666	13.30213	12.94835	
70	8.13694	7.924672	7.570892	7.358624	7.004844	6.792576	6.651064	6.509552	
75	3.89158	3.820824	3.679312	3.467044	3.325532	3.18402	3.042508	3.042508	
80	1.698144	1.627388	1.556632	1.41512	1.41512	1.344364	1.344364	1.202852	
85	0.495292	0.424536	0.495292	0.424536	0.495292	0.424536	0.35378	0.424536	
90	0.070756	0.070756	0.070756	0.141512	0.070756	0.141512	0.070756	0	

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Data for luminous intensity (9)

Intensity data(cd)		Page: 9 Total:10							
$\gamma/C(^{\circ})$	320.0	325.0	330.0	335.0	340.0	345.0	350.0	355.0	
0	19337.62	19358.84	19351.77	19372.99	19372.99	19387.14	19372.99	19344.69	
5	18630.05	18651.28	18651.28	18637.13	18722.04	18799.87	18764.49	18792.79	
10	18283.35	18148.91	18064.01	18134.76	18276.28	18361.18	18453.16	18552.22	
15	18134.76	18099.38	17922.49	17766.83	17745.61	17823.44	17865.89	17993.25	
20	16153.59	16005.01	15842.27	15658.3	15481.41	15389.43	15290.37	15205.46	
25	12545.04	12481.36	12325.7	12191.26	12035.6	11978.99	11830.4	11710.12	
30	9438.851	9368.094	9346.867	9276.111	9169.978	9092.146	8978.937	8886.954	
35	7351.549	7344.473	7316.17	7294.944	7259.566	7181.734	7125.129	7054.374	
40	5618.026	5568.497	5526.043	5504.817	5476.514	5448.212	5412.834	5384.532	
45	4022.479	3953.138	3916.344	3846.296	3795.352	3746.53	3689.926	3677.897	
50	2352.637	2275.513	2264.192	2216.785	2220.323	2199.804	2177.162	2116.312	
55	958.7438	916.2902	886.5727	834.9208	808.0335	761.3345	718.1734	681.3802	
60	27.59484	26.74577	26.10896	25.68443	25.04762	24.62309	24.34007	23.84477	
65	12.59457	12.31154	11.95776	11.67474	11.53323	11.32096	11.17945	11.03794	
70	6.155772	6.155772	5.943504	5.731236	5.66048	5.448212	5.589724	5.448212	
75	2.900996	2.900996	2.759484	2.688728	2.617972	2.547216	2.47646	2.47646	
80	1.202852	1.132096	1.132096	1.132096	1.06134	1.06134	0.990584	1.06134	
85	0.283024	0.283024	0.35378	0.283024	0.35378	0.283024	0.35378	0.283024	
90	0.070756	0	0	0.070756	0.070756	0.070756	0.070756	0.070756	

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Data for luminous intensity (10)

Intensity data(cd)

Page: 10 Total:10

$\gamma/C(^{\circ})$	360.0
0	19365.92
5	18764.49
10	18651.28
15	17964.95
20	15170.09
25	11589.83
30	8780.819
35	6983.617
40	5327.927
45	3680.02
50	2096.5
55	658.7383
60	23.42024
65	11.03794
70	5.3067
75	2.47646
80	0.990584
85	0.283024
90	0

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Equipment list and testing engineer for test

Item	Equipment No	Equipment	Manufacturer / Type / Series No
1	99A-01	Magnetic angle locator	Nigata Seiki/LM-90
2	99E-05	Digital power meter	YOKOGAWA WT210 (91K116100)
3	99E-08	Digital power meter	YOKOGAWA WT210 (91K539455)
4	99E-17	AC Power Source	APC AFC-5KW
5	99O-01	Goniophotometer System	Sensing GMS-2000
6	99O-22	Spectroradiometer (2π)	Sensing SPR-3000
7	99O-23	Integrating sphere (2π)	Sensing
8	104O-31	Photometric standard lamp 110V/100W	Sensing (S13100197)
Testing engineer : Chun-Min Chang			

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