

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 : 18030601
3. Total pages : 20
4. Test report without steel stamp is not valid, and shall not be reproduced except in full.
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:



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-301

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 346 mm 、 H 364 mm

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Test Content

Test Condition

Temperature (°C)	25.2
Humidity (% RH)	57.4
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)	21110.4
Initial luminaires efficiency(lm/W)	126.6
Central intensity (cd)	35696.4
Max intensity (cd)	36043.1
Angle for max intensity (°)	C : 100.0 γ : 5.0
Beam Angle (50% I _{max})	C0_180 Left=14.5 Right=16.1
	C90_270 Left=14.4 Right=16.6
Color temperature(K)	5284
Chromaticity Coordinates	x : 0.3378 y : 0.3500
Rendering Index(Ra) / R9	84.0 / 22

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Diagram for luminous intensity distribution I

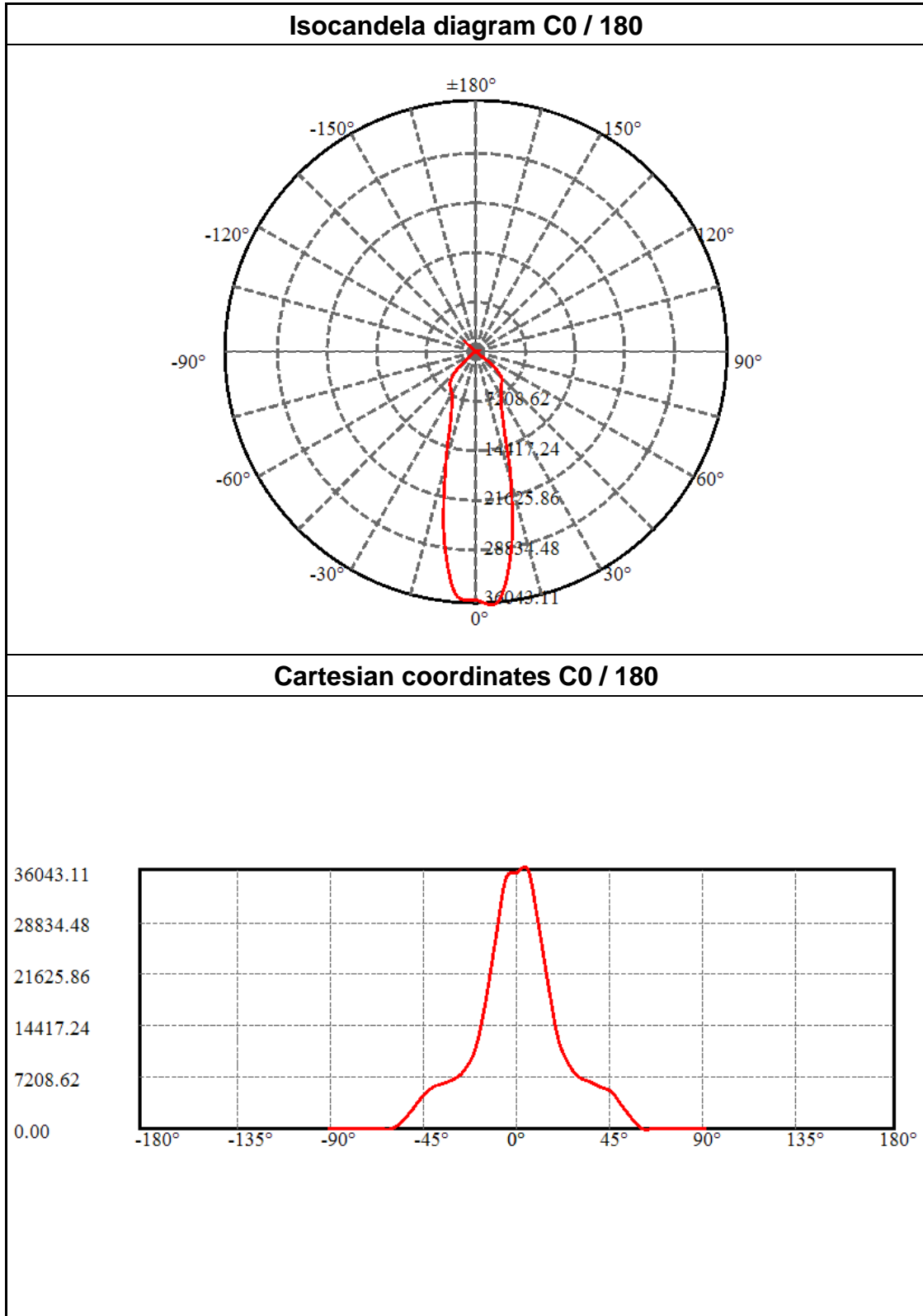


Diagram for luminous intensity distribution II

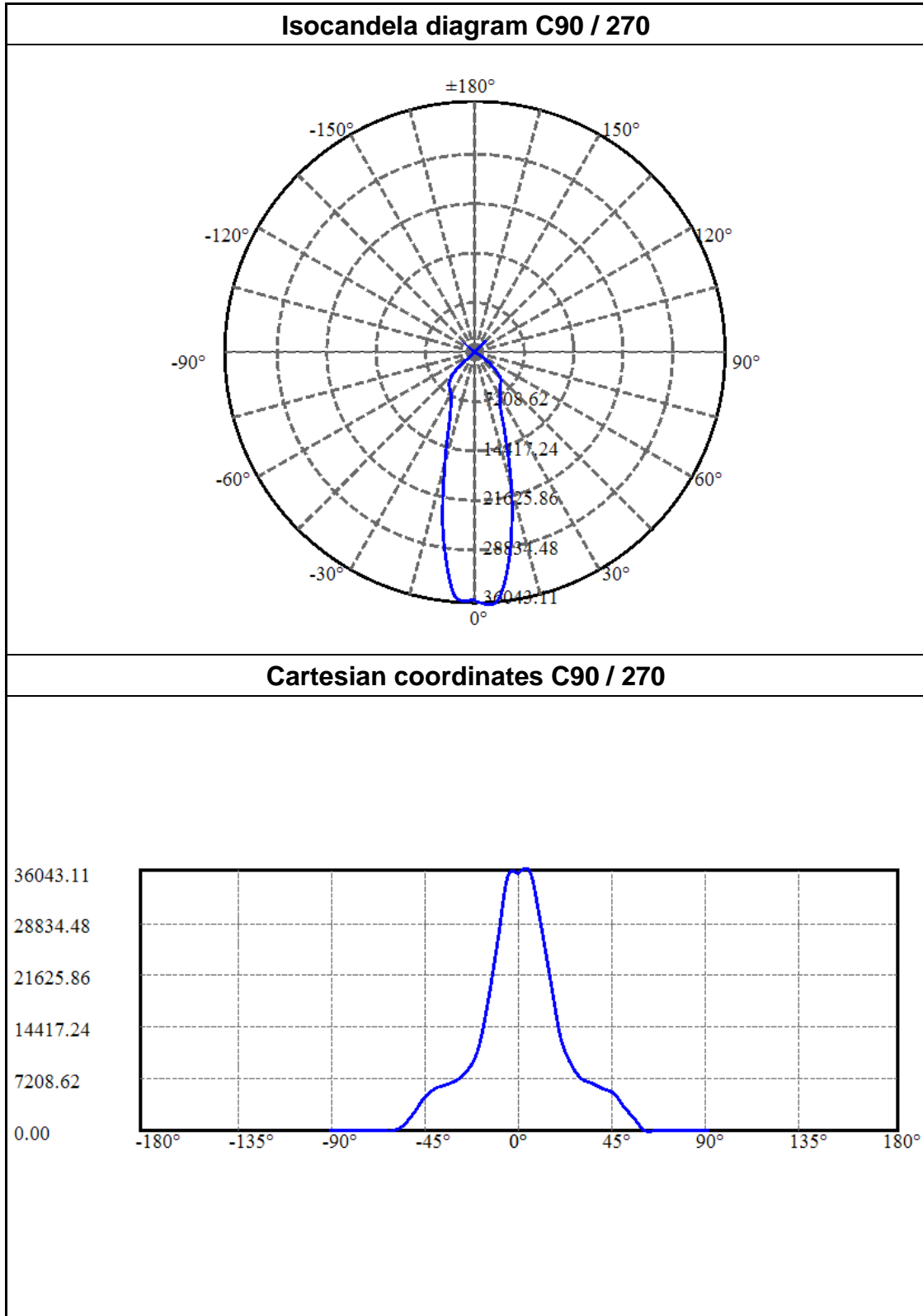
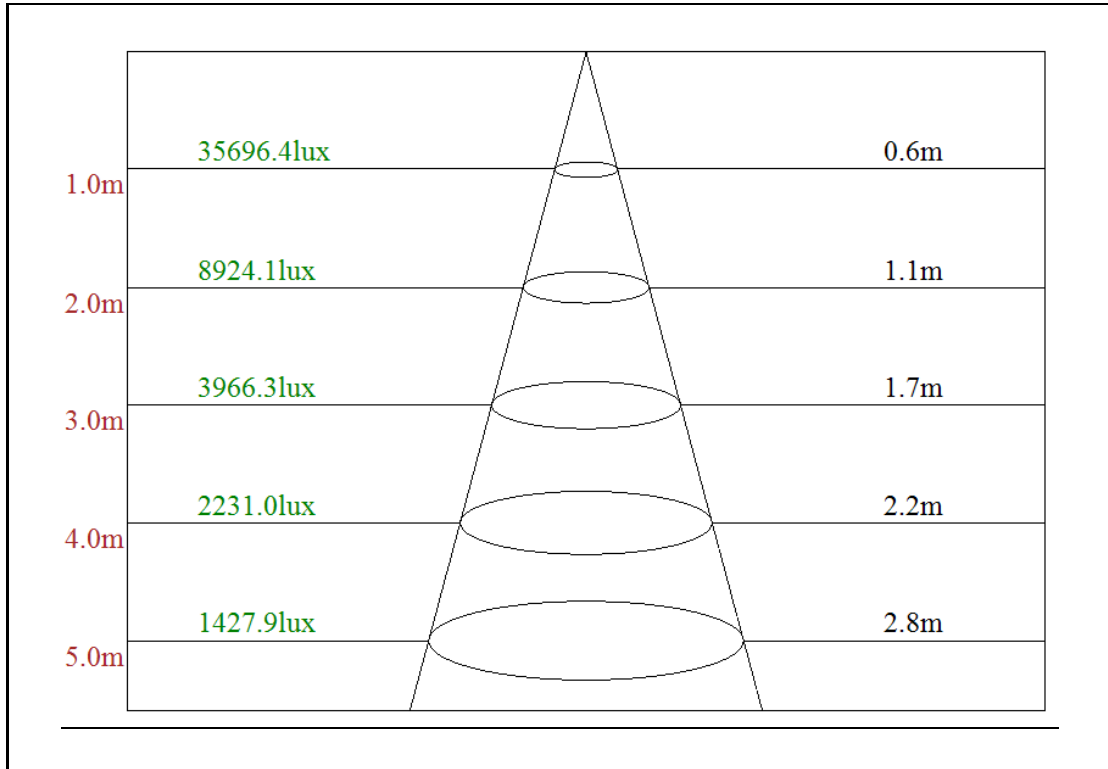


Diagram for illumination distance



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Test Results

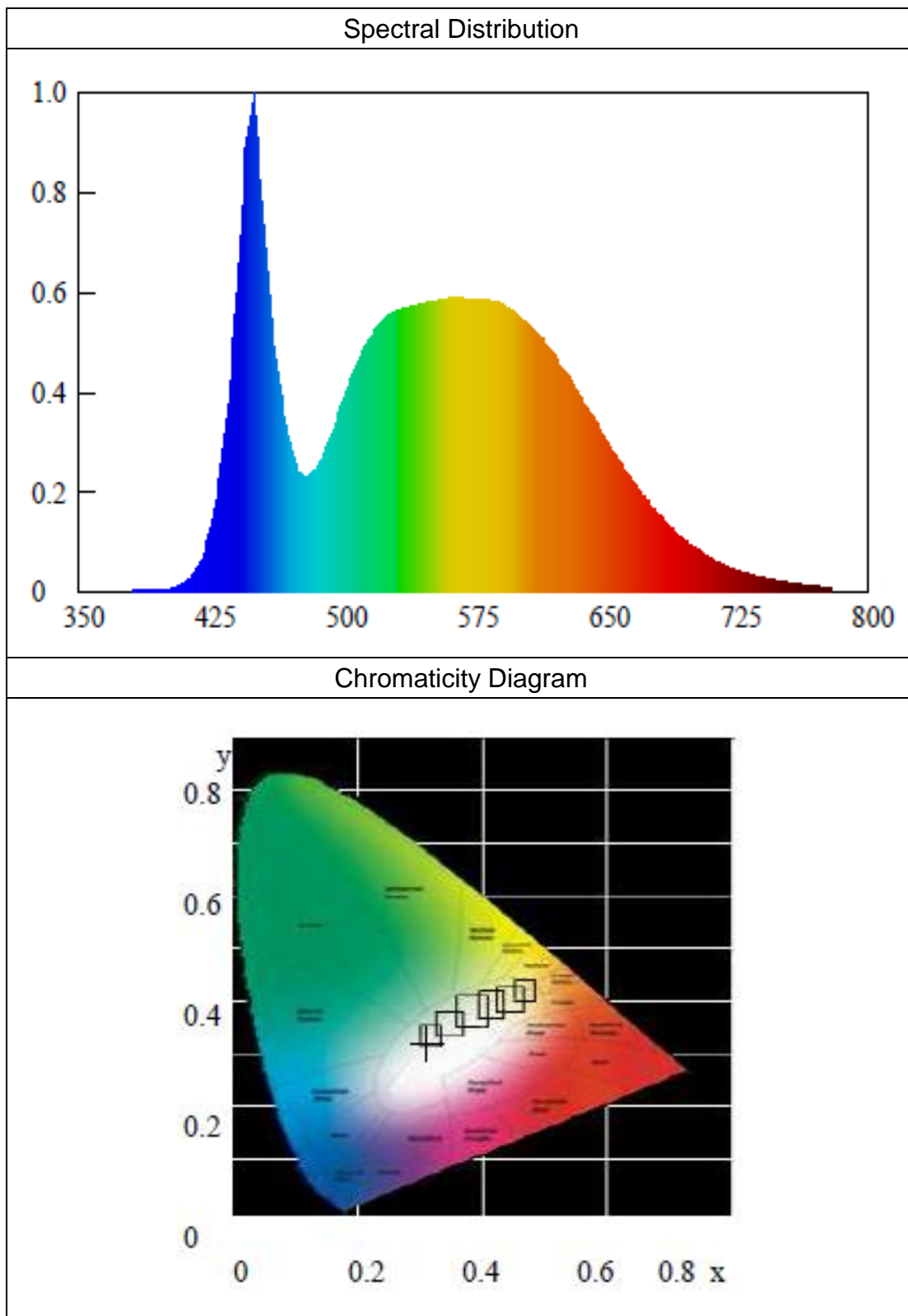
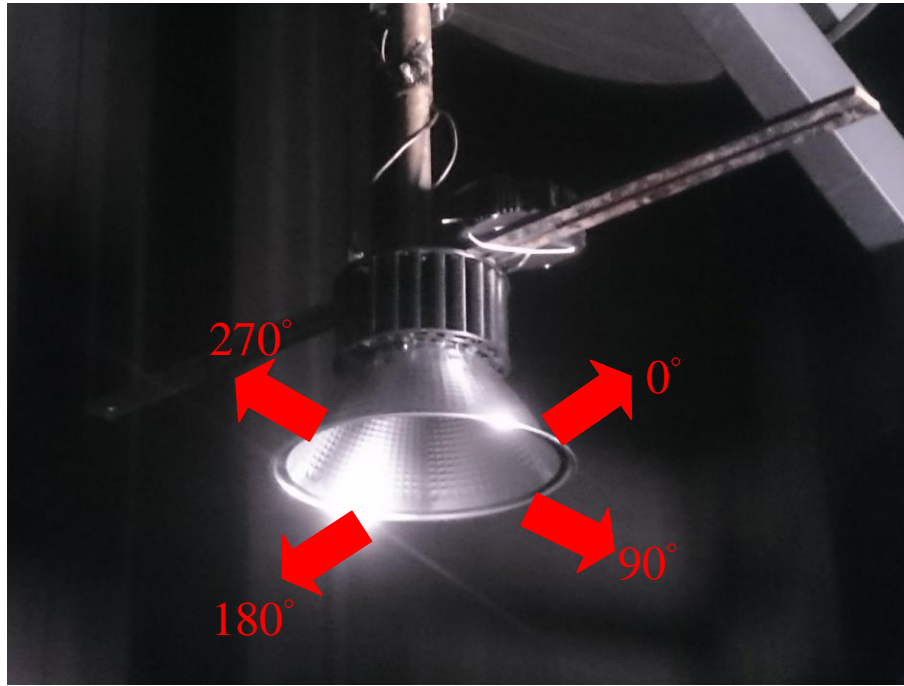


Photo for test items

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	35696.4	35689.32	35703.48	35696.4	35696.4	35682.25	35703.48	35682.25
5	35936.97	36007.73	36000.65	35972.35	35965.28	35844.99	35823.76	35837.91
10	29038.26	29144.39	29222.23	29370.81	29427.42	29469.88	29547.71	29561.86
15	19486.2	19705.55	19854.13	20087.63	20257.44	20469.71	20618.3	20703.21
20	12339.85	12467.21	12530.89	12644.1	12714.85	12806.84	12870.52	12948.35
25	8766.669	8837.424	8858.651	8901.104	8943.559	8964.785	9000.163	9000.163
30	7181.734	7195.885	7231.263	7245.414	7238.338	7259.566	7252.49	7280.792
35	6403.418	6424.645	6417.569	6445.871	6460.023	6438.796	6474.174	6488.325
40	5872.748	5872.748	5893.975	5886.899	5886.899	5908.126	5915.201	5929.353
45	5101.508	5143.961	5179.339	5243.02	5278.397	5278.397	5264.247	5264.247
50	3272.465	3346.759	3400.533	3433.789	3464.921	3491.809	3491.101	3512.328
55	1412.29	1413.705	1432.809	1453.328	1476.678	1507.81	1512.056	1537.528
60	23.84477	24.7646	26.17972	29.29298	36.5101	49.31693	58.65673	68.70407
65	10.40113	10.75491	10.96718	11.25021	11.60398	12.02852	12.3823	12.87759
70	5.448212	5.66048	5.801992	5.943504	6.226528	6.36804	6.651064	6.792576
75	2.83024	2.971752	2.971752	3.113264	3.18402	3.396288	3.396288	3.5378
80	1.41512	1.41512	1.556632	1.627388	1.556632	1.627388	1.7689	1.839656
85	0.566048	0.636804	0.636804	0.636804	0.70756	0.70756	0.70756	0.70756
90	0.212268	0.141512	0.141512	0.070756	0.070756	0.141512	0.141512	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	35689.32	35689.32	35696.4	35696.4	35724.71	35710.55	35717.63	35710.55	
5	35837.91	35844.99	35866.21	35823.76	35774.23	35767.16	35767.16	35745.93	
10	29660.91	29682.14	29795.35	29781.2	29781.2	29767.05	29738.75	29731.67	
15	20837.64	20865.94	20943.78	20957.93	20950.85	20929.63	20837.64	20752.73	
20	12997.88	13026.18	13040.33	13054.48	13019.1	12990.8	12976.65	12870.52	
25	9028.466	9056.769	9063.844	9063.844	9077.995	9042.616	9028.466	8986.012	
30	7302.019	7309.095	7316.17	7323.246	7302.019	7294.944	7245.414	7238.338	
35	6509.552	6495.401	6495.401	6488.325	6495.401	6481.25	6495.401	6474.174	
40	5922.277	5908.126	5915.201	5915.201	5922.277	5922.277	5908.126	5901.05	
45	5292.549	5306.7	5327.927	5313.776	5285.473	5271.322	5243.02	5186.415	
50	3558.319	3589.452	3622.707	3602.896	3586.622	3568.225	3545.583	3520.818	
55	1565.123	1575.736	1587.057	1598.378	1604.746	1612.529	1616.775	1597.67	
60	75.92119	79.88352	82.35999	81.08638	75.85043	63.60965	53.42078	43.23191	
65	13.30213	13.58515	13.93893	14.22196	14.36347	14.43422	14.43422	14.36347	
70	7.146356	7.358624	7.570892	7.641648	7.853916	7.924672	7.924672	7.853916	
75	3.750068	3.820824	3.962336	4.033092	4.174604	4.174604	4.174604	4.24536	
80	1.839656	1.910412	2.051924	2.12268	2.12268	2.193436	2.193436	2.12268	
85	0.849072	0.849072	0.919828	0.919828	0.849072	0.919828	0.919828	0.990584	
90	0.070756	0.141512	0.141512	0.141512	0.212268	0.070756	0.212268	0.141512	

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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	35703.48	35710.55	35710.55	35710.55	35696.4	35696.4	35703.48	35689.32	
5	35788.39	35844.99	35901.59	35972.35	36043.11	36036.03	35936.97	35809.61	
10	29611.38	29568.93	29420.35	29300.06	29201	29045.34	28981.66	28868.45	
15	20653.68	20512.16	20328.2	20193.76	20031.02	19825.83	19627.71	19429.6	
20	12856.37	12764.38	12672.4	12587.49	12523.81	12396.45	12276.17	12191.26	
25	8936.482	8908.181	8872.803	8830.349	8752.517	8717.139	8646.384	8561.477	
30	7224.188	7217.112	7217.112	7202.961	7210.036	7153.431	7096.827	7089.751	
35	6445.871	6445.871	6445.871	6438.796	6396.342	6396.342	6396.342	6368.04	
40	5886.899	5879.824	5865.672	5865.672	5858.597	5837.37	5809.067	5809.067	
45	5151.037	5129.81	5122.734	5108.583	5073.205	5037.827	4967.071	4938.769	
50	3498.884	3492.516	3468.459	3435.204	3409.731	3393.458	3309.258	3269.635	
55	1589.887	1583.519	1571.491	1541.773	1505.688	1487.291	1422.903	1396.016	
60	40.89697	45.00082	42.09982	33.82137	29.64676	27.38257	25.8967	24.62309	
65	14.1512	13.86818	13.44364	13.16062	12.66532	12.31154	11.95776	11.53323	
70	7.78316	7.570892	7.358624	7.0756	6.863332	6.651064	6.438796	6.155772	
75	4.103848	4.033092	3.820824	3.750068	3.608556	3.396288	3.254776	3.113264	
80	2.12268	2.051924	1.981168	1.910412	1.839656	1.7689	1.698144	1.627388	
85	0.919828	0.849072	0.778316	0.778316	0.778316	0.70756	0.70756	0.636804	
90	0.141512	0.141512	0.212268	0.070756	0.141512	0.141512	0.141512	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	35710.55	35696.4	35696.4	35682.25	35689.32	35668.1	35675.17	35668.1	
5	35611.5	35434.61	35257.71	35052.52	34939.31	34797.8	34712.89	34599.68	
10	28762.31	28592.5	28500.52	28422.68	28245.79	28104.28	27927.39	27757.58	
15	19245.63	19068.74	18891.85	18686.66	18488.54	18297.5	18148.91	17943.72	
20	12085.13	12000.22	11887.01	11787.95	11688.89	11568.61	11462.47	11320.96	
25	8526.098	8476.568	8448.266	8427.039	8384.586	8320.905	8278.452	8221.847	
30	7054.374	7040.222	7026.071	6990.693	6983.617	6976.542	6941.164	6934.088	
35	6375.116	6360.964	6325.586	6311.435	6290.208	6304.359	6304.359	6283.133	
40	5816.144	5809.067	5780.765	5759.539	5766.614	5752.463	5738.312	5724.161	
45	4889.239	4882.164	4846.786	4853.862	4825.559	4790.181	4747.728	4705.274	
50	3177.652	3094.16	2997.932	2953.355	2949.11	2879.769	2834.485	2785.664	
55	1345.779	1304.033	1255.919	1214.88	1170.304	1122.19	1060.632	1025.962	
60	23.77402	22.9957	22.21738	21.36831	20.80226	20.0947	19.59941	19.03337	
65	11.17945	10.82567	10.54264	10.04735	9.976596	9.764328	9.55206	9.339792	
70	5.872748	5.731236	5.589724	5.518968	5.235944	5.165188	5.023676	4.95292	
75	3.042508	2.971752	2.900996	2.759484	2.759484	2.759484	2.547216	2.617972	
80	1.556632	1.41512	1.485876	1.41512	1.344364	1.273608	1.273608	1.273608	
85	0.636804	0.566048	0.495292	0.495292	0.495292	0.495292	0.424536	0.424536	
90	0.141512	0.141512	0.070756	0.141512	0.141512	0.141512	0.070756	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	35682.25	35682.25	35668.1	35668.1	35646.88	35661.02	35661.02	35646.88
5	34557.23	34571.38	34649.21	34712.89	34741.2	34755.35	34755.35	34734.12
10	27538.23	27233.99	27042.94	26830.67	26710.39	26618.41	26491.04	26377.84
15	17759.76	17554.56	17405.98	17236.16	17073.42	16917.76	16804.55	16740.87
20	11214.83	11136.99	11037.94	10988.41	10910.58	10846.89	10804.44	10754.91
25	8186.469	8136.94	8122.789	8087.411	8066.184	8037.881	8016.655	8009.579
30	6919.937	6905.786	6898.71	6891.634	6870.408	6842.105	6849.181	6820.878
35	6283.133	6283.133	6261.906	6254.831	6226.528	6219.452	6198.226	6184.074
40	5731.236	5731.236	5731.236	5731.236	5731.236	5695.858	5688.782	5681.707
45	4676.972	4648.669	4606.216	4549.611	4521.308	4528.384	4507.157	4478.854
50	2743.918	2701.464	2709.955	2710.662	2687.313	2644.152	2591.085	2545.801
55	969.3572	943.885	902.139	849.072	803.0806	776.1933	747.8909	702.6071
60	18.60883	18.18429	17.83051	17.54749	17.40598	17.12295	16.98144	17.0522
65	9.269036	9.127524	9.056767	8.915256	8.844501	8.844501	8.773745	8.915256
70	4.811408	4.740652	4.740652	4.669896	4.740652	4.669896	4.59914	4.740652
75	2.47646	2.47646	2.405704	2.405704	2.405704	2.405704	2.334948	2.334948
80	1.202852	1.202852	1.132096	1.202852	1.202852	1.202852	1.132096	1.202852
85	0.424536	0.424536	0.424536	0.35378	0.424536	0.35378	0.35378	0.35378
90	0.070756	0.070756	0.070756	0	0.141512	0.070756	0.070756	0.070756

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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	35632.72	35639.8	35618.57	35632.72	35625.64	35632.72	35639.8	35639.8	
5	34741.2	34769.5	34790.72	34819.03	34882.71	34889.79	34875.63	34882.71	
10	26271.7	26186.79	26080.66	26080.66	26024.06	26002.83	26002.83	25988.68	
15	16648.89	16571.05	16521.53	16486.15	16443.69	16429.54	16401.24	16443.69	
20	10712.46	10698.31	10677.08	10670	10677.08	10677.08	10684.16	10670	
25	7995.428	7974.202	7967.126	7960.05	7995.428	8009.579	8016.655	8023.73	
30	6835.029	6856.256	6849.181	6835.029	6835.029	6849.181	6842.105	6856.256	
35	6205.301	6198.226	6191.15	6198.226	6191.15	6205.301	6212.376	6205.301	
40	5688.782	5688.782	5702.934	5702.934	5710.009	5695.858	5695.858	5717.085	
45	4457.628	4457.628	4464.704	4485.931	4457.628	4443.477	4422.25	4393.948	
50	2509.008	2464.431	2448.865	2437.544	2443.205	2465.846	2425.516	2446.035	
55	696.9466	647.4174	617.6999	599.3033	621.2377	609.2092	631.1436	611.3318	
60	16.91068	16.98144	17.0522	17.19371	17.33522	17.61824	17.83051	17.97202	
65	8.986012	8.986012	9.127524	9.269036	9.410548	9.622816	9.764328	9.90584	
70	4.740652	4.811408	4.882164	5.023676	5.165188	5.165188	5.235944	5.377456	
75	2.405704	2.47646	2.547216	2.617972	2.617972	2.688728	2.759484	2.83024	
80	1.273608	1.273608	1.202852	1.344364	1.273608	1.273608	1.273608	1.41512	
85	0.35378	0.424536	0.424536	0.424536	0.35378	0.424536	0.424536	0.495292	
90	0.141512	0.070756	0.141512	0.141512	0.070756	0.070756	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	35661.02	35646.88	35653.95	35653.95	35653.95	35661.02	35661.02	35668.1	
5	34882.71	34896.86	34939.31	34974.69	35010.07	35031.29	35038.37	35052.52	
10	26009.9	26016.98	26031.13	26130.19	26236.33	26278.78	26349.54	26391.99	
15	16443.69	16486.15	16507.38	16563.98	16606.43	16684.27	16769.17	16861.15	
20	10691.23	10698.31	10698.31	10726.61	10747.84	10761.99	10818.59	10846.89	
25	8037.881	8023.73	8023.73	8009.579	8016.655	8016.655	8037.881	8044.957	
30	6870.408	6870.408	6863.332	6856.256	6870.408	6870.408	6877.483	6884.559	
35	6205.301	6226.528	6226.528	6212.376	6219.452	6226.528	6247.755	6240.679	
40	5738.312	5724.161	5724.161	5717.085	5738.312	5752.463	5766.614	5780.765	
45	4393.948	4393.948	4386.872	4401.023	4415.174	4429.326	4443.477	4457.628	
50	2421.27	2412.78	2414.902	2424.808	2426.223	2424.808	2481.413	2506.885	
55	600.7184	579.4916	593.6428	605.6714	629.7284	641.7569	679.9651	721.0037	
60	18.3258	18.39656	18.60883	18.67958	18.67958	18.67958	18.67958	18.60883	
65	10.04735	10.11811	10.11811	10.18886	10.18886	10.04735	9.90584	9.835084	
70	5.448212	5.518968	5.518968	5.518968	5.518968	5.448212	5.3067	5.3067	
75	2.83024	2.900996	2.971752	2.900996	2.900996	2.900996	2.759484	2.83024	
80	1.41512	1.344364	1.485876	1.344364	1.41512	1.41512	1.344364	1.344364	
85	0.424536	0.424536	0.495292	0.424536	0.424536	0.424536	0.424536	0.424536	
90	0	0	0.070756	0.070756	0.070756	0.141512	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	35682.25	35675.17	35675.17	35675.17	35675.17	35689.32	35668.1	35682.25	
5	35010.07	34988.84	34967.61	34911.01	34868.55	34868.55	34861.48	34840.25	
10	26469.82	26639.63	26689.16	26873.13	27078.32	27191.53	27495.78	27764.66	
15	16960.21	17066.35	17186.63	17363.52	17483.81	17681.92	17872.96	18035.71	
20	10910.58	10967.18	11045.01	11122.84	11193.6	11292.66	11391.72	11497.85	
25	8080.335	8122.789	8151.091	8186.469	8207.696	8228.923	8271.376	8306.754	
30	6912.861	6919.937	6927.012	6927.012	6955.315	6969.466	6969.466	6983.617	
35	6254.831	6261.906	6240.679	6254.831	6283.133	6297.284	6311.435	6311.435	
40	5787.841	5759.539	5759.539	5773.689	5773.689	5773.689	5773.689	5766.614	
45	4493.006	4514.233	4542.535	4584.989	4634.518	4662.82	4691.123	4726.5	
50	2538.018	2548.631	2602.406	2643.444	2682.36	2730.474	2783.541	2826.702	
55	769.8253	849.072	872.4215	878.082	911.3373	911.3373	946.7153	982.8009	
60	18.53807	18.60883	18.53807	18.67958	18.75034	18.8211	19.03337	19.31639	
65	9.693572	9.55206	9.481303	9.410548	9.269036	9.339792	9.269036	9.269036	
70	5.235944	5.094432	5.023676	4.95292	4.882164	4.882164	4.882164	4.95292	
75	2.688728	2.617972	2.547216	2.617972	2.547216	2.47646	2.47646	2.47646	
80	1.273608	1.273608	1.202852	1.202852	1.202852	1.202852	1.202852	1.202852	
85	0.424536	0.424536	0.424536	0.424536	0.424536	0.424536	0.495292	0.495292	
90	0.070756	0.070756	0.070756	0.070756	0.070756	0.141512	0.070756	0.141512	

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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	35668.1	35689.32	35668.1	35682.25	35682.25	35689.32	35689.32	35717.63	
5	34804.88	34833.18	34939.31	34988.84	35130.36	35342.62	35611.5	35830.84	
10	27955.69	28274.1	28387.31	28535.9	28698.63	28811.84	28903.82	28960.43	
15	18226.75	18389.48	18516.85	18686.66	18821.1	18990.91	19146.57	19295.16	
20	11589.83	11681.82	11773.8	11865.78	11964.84	12049.75	12155.88	12269.09	
25	8363.359	8405.813	8469.493	8547.325	8582.703	8603.93	8660.534	8702.988	
30	7011.919	7054.374	7075.6	7082.676	7103.902	7110.978	7132.205	7160.507	
35	6297.284	6325.586	6332.662	6353.889	6368.04	6382.191	6389.267	6396.342	
40	5773.689	5773.689	5794.916	5816.144	5816.144	5844.446	5851.521	5851.521	
45	4747.728	4776.03	4804.333	4875.088	4910.466	4945.844	4988.298	5066.129	
50	2896.043	2934.959	3025.527	3058.782	3080.716	3111.141	3162.085	3205.247	
55	1031.622	1070.538	1100.963	1167.474	1221.249	1274.316	1321.015	1359.223	
60	19.52866	19.81168	20.23622	20.51924	20.87302	21.43907	22.21738	22.92494	
65	9.339792	9.481303	9.55206	9.693572	9.764328	9.835084	10.11811	10.25962	
70	4.882164	4.95292	4.95292	5.023676	5.094432	5.165188	5.3067	5.377456	
75	2.47646	2.547216	2.547216	2.547216	2.688728	2.617972	2.688728	2.688728	
80	1.202852	1.273608	1.273608	1.273608	1.273608	1.273608	1.273608	1.344364	
85	0.495292	0.495292	0.424536	0.566048	0.566048	0.495292	0.566048	0.566048	
90	0.212268	0.141512	0.141512	0.141512	0.141512	0.070756	0.070756	0.212268	

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Data for luminous intensity (10)

Intensity data(cd)

Page: 10 Total:10

$\gamma/C(^{\circ})$	360.0
0	35696.4
5	35936.97
10	29038.26
15	19486.2
20	12339.85
25	8766.669
30	7181.734
35	6403.418
40	5872.748
45	5101.508
50	3272.465
55	1412.29
60	23.84477
65	10.40113
70	5.448212
75	2.83024
80	1.41512
85	0.566048
90	0.212268

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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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