



Report No.: GZE151292-B

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

IGT LIGHTING INC.

3755 Lincoln St. Suite B, Riverside, CA 92503

High-Bay Luminaires for Commercial and Industrial buildings

Model name(s): IGTHB-0220050C

Remark: The letter "XX" of the model name stand for different CCT as follow: "40"="4000K"; "57"="5700K"; The letter "YYY" in the model name stand for different employed diffuser, such as: "60: 60° angle diffuser"; "120: 120° angle diffuser".

Representative (Tested) Model: IGTHB-0220050C

Test & Report By:

Peeta Cao

Engineer: Peeta Cao

Date: 2015-12-29

Review By:

Tommy Liang

Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-C/2

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

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<http://www.standard-tech.com>

U.S. Department of Energy

Lighting Facts™ Uniform LM-79 Reporting Template
Laboratory Information:

Name of Test Laboratory	Standard-Tech Co., Ltd.
Date of Test Report	2015-12-29
Test Report No.	GZE151292-B
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	IGT LIGHTING INC.	
Brand Name	IGT LIGHTING	
Model Number	IGTHB-0220050C	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	High-Bay luminaires for Commercial and Industrial buildings	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Integrating Sphere
Goniophotometer
Electrical Measurements:

	Output	Output	
Input Wattage	--	190.1	W
Input Current	--	1.597	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9919	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	23877	lm
Initial Lumen Efficacy	--	125.63	lm/w
Correlated color temperature / CCT	3894	--	K
Color rendering index / CRI	71.4	--	
R9 Value	0	--	
Duv	0.0025	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)		8484	cd
Beam angle (if applicable)		113.7	°
Zonal lumens in the 0°-60° zone	-----	81.9	%
Zonal lumens in the 60°-90° zone		17.9	%
Zonal lumens in the 90°-120° zone		0.1	%
Zonal lumens in the 120°-180° zone		0.1	%

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Test Specifications:	
Date of Receipt	: 2015-11-23
Date of Test	: 2015-12-20
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry IESNA LM-16-93 Practical Guide to Colorimetry of Light Source IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

Test Methods

1. Photometric and Electrical measurements – Light Distribution Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1 ° vertical intervals and 22.5 ° horizontal intervals.

2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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 sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

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1. Product Information:

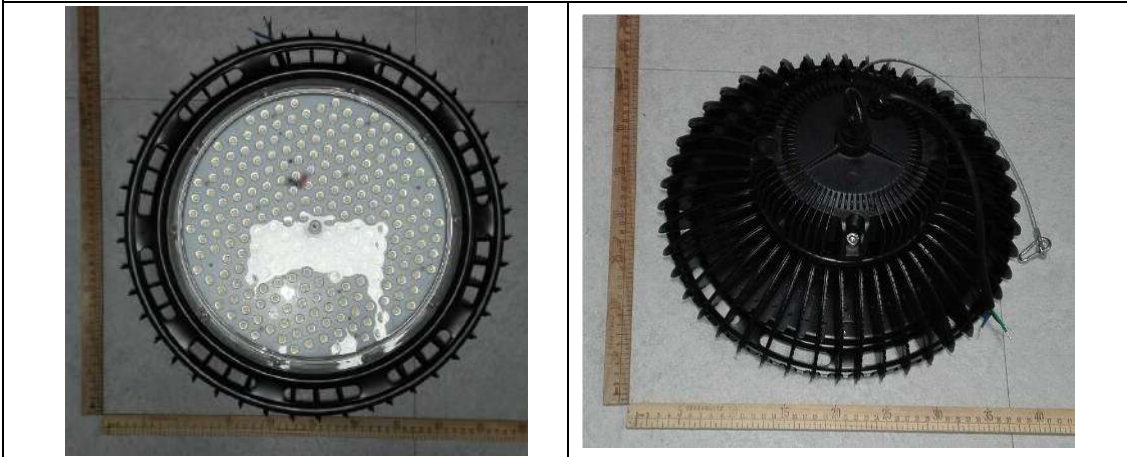
Brand Name	IGT LIGHTING
Model Number	IGTHB-0220050C
Luminaire Type	High-Bay Luminaires for Commercial and Industrial buildings
Rated Voltage / Frequency	100~ 277Vac, 50/60Hz
Nominal Power	200W
Rated Initial Lamp Lumen	--
Declared CCT	4000K,5700K
LED Manufacturer	Nichia Corporation
LED Model	NF2L757DR
Sample Receipt Date	2015-11-23
Sample Number	GZE151292-B1(4000K)[XSY-HBPF200W-40K-120] GZE151292-B2(5700K)[XSY-HBPF200W-57K-120] GZE151292-B3(4000K)[XSY-HBPF200W-40K-60] GZE151292-B4(5700K)[XSY-HBPF200W-57K-60]

Photo

XSY-HBPF200W-40K-120



XSY-HBPF200W-40K-60



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2.1 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-12-20	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IGTHB-0220050C		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE151162	120.0	60	1.597	190.1	0.9919	10.06
-B2	277.0	60	0.7352	186.4	0.9153	13.61

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	71.4
R9	0
CCT (K)	3894
Chromaticity (x, y)	x=0.3872 y=0.3862
Chromaticity (u', v')	u'=0.2257 v'=0.5067
Duv	0.0025

Special Color Rendering Indices			
R1	69	R9	0
R2	77	R10	45
R3	83	R11	65
R4	71	R12	37
R5	67	R13	70
R6	67	R14	90
R7	82	R15	64
R8	54	--	--

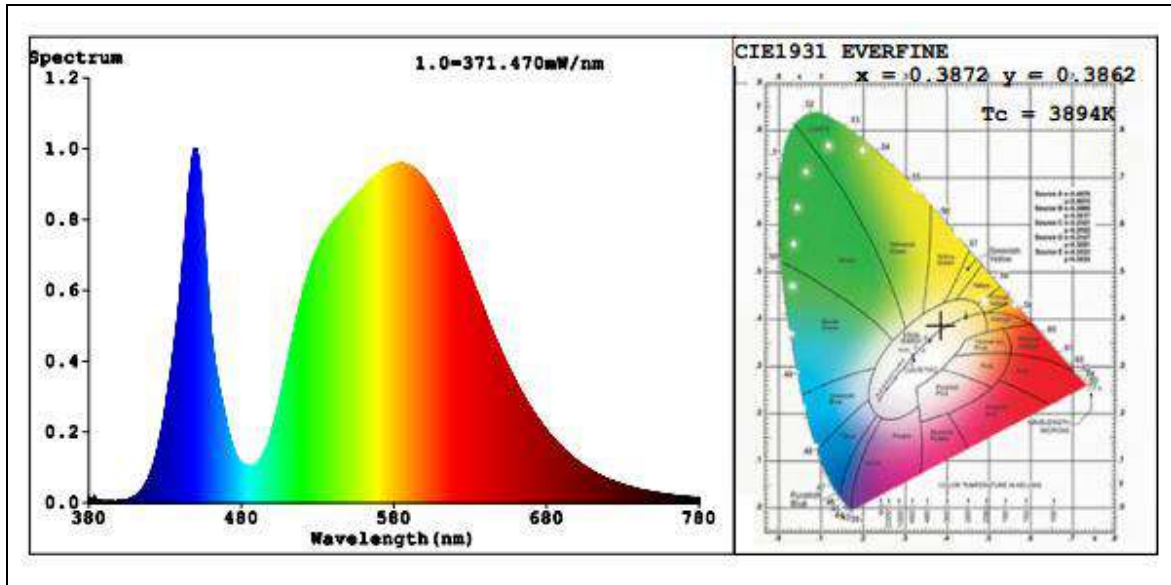
Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	23877
Luminous Efficacy (lm/W)	125.63
Beam Angle °	113.7
Center Beam Candle Power (cd)	8484

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	24163
Luminous Efficacy (lm/W)	129.63

Spectral Power Distribution & Chromaticity Diagram



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Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	6,667.3	27.9%
0-40	10,997.5	46.1%
0-60	19,547.8	81.9%
60-90	4,274.3	17.9%
70-100	1,441.2	6%
90-120	13.8	0.1%
0-90	23,822.1	99.8%
90-180	52.2	0.2%
0-180	23,874.3	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	803.6	3.4%	90-100	2.3	0%
10-20	2,315.6	9.7%	100-110	4.5	0%
20-30	3,548.1	14.9%	110-120	7.1	0%
30-40	4,330.2	18.1%	120-130	9.2	0%
40-50	4,524.9	19.0%	130-140	9.2	0%
50-60	4,025.4	16.9%	140-150	8.1	0%
60-70	2,835.3	11.9%	150-160	6.4	0%
70-80	1,282.6	5.4%	160-170	4.0	0%
80-90	156.3	0.7%	170-180	1.6	0%

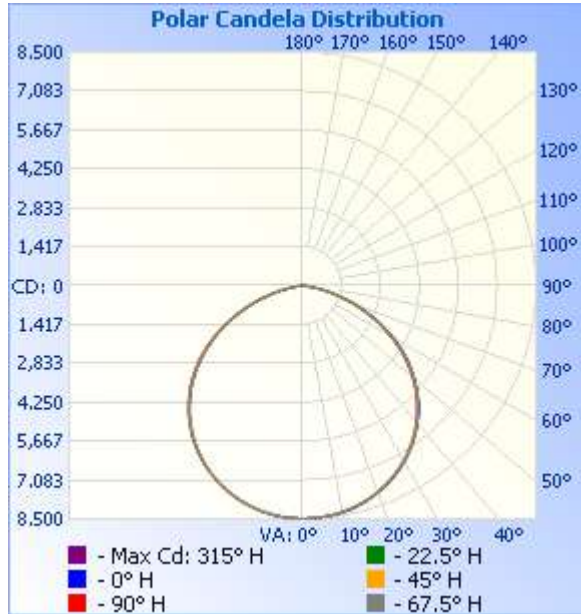
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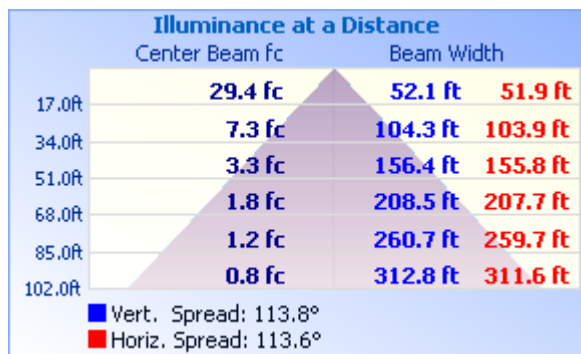
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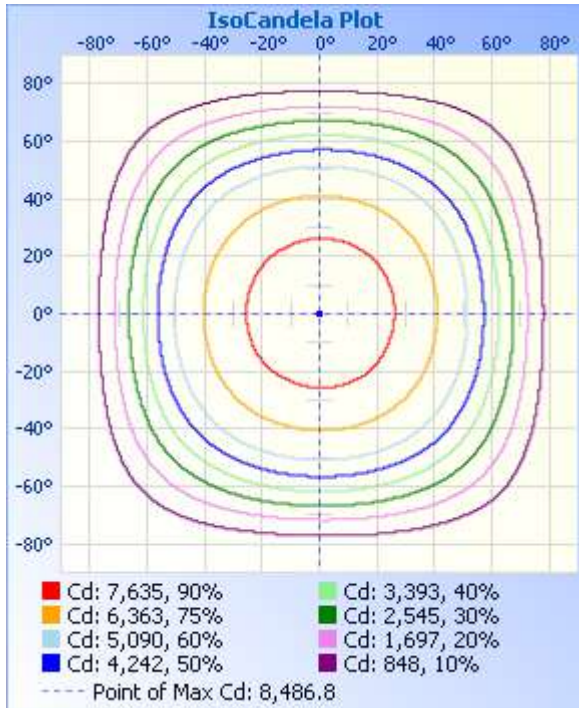
Photometric Data



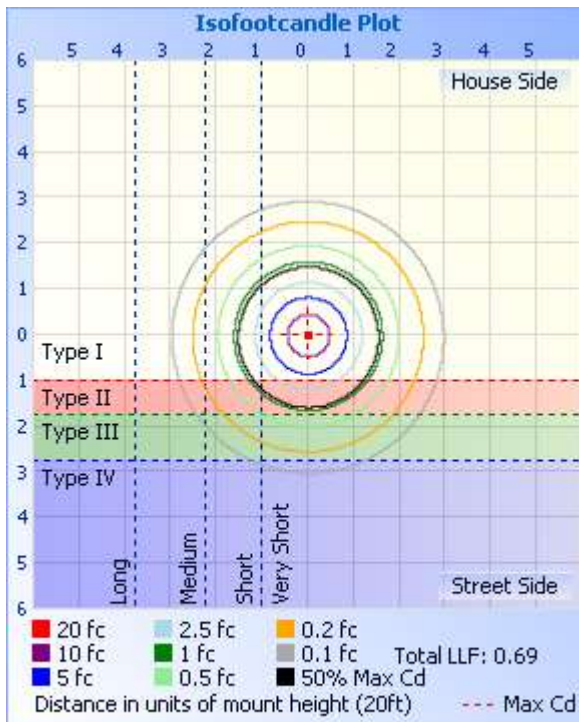
Illuminance Plots



ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	8484	8484	8484	8484	8484	8484	8484	8484	8484	8484	8484	8484	8484	8484	8484	8484	8484
1	8486	8484	8479	8483	8480	8480	8479	8478	8480	8481	8485	8480	8484	8485	8487	8485	8486
2	8482	8479	8475	8479	8476	8475	8473	8471	8476	8476	8483	8476	8483	8482	8485	8485	8482
3	8477	8473	8468	8471	8469	8469	8465	8460	8474	8468	8479	8467	8477	8477	8481	8480	8477
4	8469	8464	8459	8463	8462	8457	8455	8446	8466	8460	8469	8455	8469	8470	8473	8471	8469
5	8459	8452	8448	8452	8448	8445	8442	8431	8454	8451	8455	8443	8457	8458	8463	8459	8459
6	8448	8440	8435	8438	8434	8430	8424	8413	8440	8435	8435	8428	8443	8444	8449	8445	8448
7	8435	8425	8421	8423	8418	8414	8405	8394	8424	8419	8415	8408	8426	8428	8432	8427	8435
8	8420	8408	8403	8404	8401	8395	8383	8371	8403	8396	8395	8389	8403	8411	8411	8408	8420
9	8403	8388	8382	8383	8381	8376	8359	8349	8380	8374	8375	8370	8379	8391	8388	8386	8403
10	8386	8373	8357	8360	8357	8354	8331	8324	8355	8349	8353	8349	8354	8368	8364	8363	8386
11	8365	8348	8330	8334	8331	8328	8302	8296	8325	8323	8324	8325	8327	8341	8336	8337	8365
12	8342	8320	8302	8306	8301	8297	8272	8267	8290	8294	8291	8300	8299	8312	8306	8307	8342
13	8314	8291	8270	8275	8272	8265	8243	8240	8256	8262	8257	8269	8269	8278	8272	8278	8314
14	8277	8257	8237	8242	8238	8231	8211	8206	8220	8225	8223	8235	8235	8243	8237	8245	8277
15	8242	8219	8203	8209	8199	8196	8174	8170	8179	8188	8188	8202	8200	8206	8201	8208	8242
16	8200	8180	8166	8171	8158	8160	8134	8132	8140	8146	8150	8164	8160	8166	8165	8172	8200
17	8158	8143	8128	8132	8116	8117	8092	8090	8097	8103	8110	8120	8119	8123	8129	8134	8158
18	8116	8106	8085	8089	8076	8071	8051	8048	8053	8057	8066	8071	8075	8080	8091	8095	8116
19	8068	8064	8038	8043	8031	8024	8004	8004	8007	8008	8021	8016	8028	8032	8047	8059	8068
20	8020	8014	7987	7994	7982	7973	7956	7955	7956	7958	7973	7954	7978	7983	7998	8021	8020
21	7968	7963	7935	7941	7928	7921	7905	7903	7900	7907	7924	7895	7921	7931	7945	7978	7968
22	7918	7910	7881	7886	7872	7864	7853	7848	7846	7851	7871	7842	7864	7877	7890	7927	7918
23	7863	7854	7829	7828	7814	7809	7795	7785	7791	7796	7814	7785	7805	7823	7833	7872	7863
24	7808	7800	7774	7767	7755	7749	7729	7717	7736	7734	7750	7725	7742	7769	7778	7814	7808
25	7750	7737	7716	7709	7694	7684	7663	7647	7673	7666	7683	7657	7684	7714	7720	7752	7750
26	7686	7672	7654	7647	7632	7617	7599	7578	7603	7600	7615	7595	7622	7648	7662	7684	7686
27	7621	7607	7591	7587	7562	7550	7532	7506	7529	7532	7545	7533	7559	7578	7595	7609	7621
28	7552	7537	7526	7520	7491	7485	7465	7433	7460	7459	7465	7470	7486	7507	7522	7529	7552
29	7478	7465	7455	7448	7421	7414	7392	7356	7386	7382	7384	7398	7412	7435	7450	7451	7478

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30	7404	7391	7385	7371	7349	7337	7311	7283	7309	7301	7304	7314	7336	7364	7371	7375	7404
31	7324	7313	7308	7291	7269	7255	7227	7213	7228	7217	7220	7233	7260	7284	7291	7301	7324
32	7249	7236	7230	7210	7187	7173	7141	7141	7141	7133	7138	7155	7180	7203	7214	7234	7249
33	7163	7155	7143	7131	7109	7084	7056	7062	7050	7054	7051	7068	7098	7120	7135	7160	7163
34	7079	7071	7053	7041	7027	6995	6973	6974	6962	6968	6961	6973	7011	7031	7050	7085	7079
35	6992	6981	6959	6954	6937	6901	6880	6881	6873	6880	6869	6880	6920	6939	6965	7002	6992
36	6899	6884	6868	6863	6839	6807	6786	6782	6782	6788	6774	6789	6823	6847	6877	6912	6899
37	6799	6787	6781	6770	6742	6711	6689	6677	6687	6688	6677	6697	6727	6754	6785	6822	6799
38	6708	6697	6686	6665	6645	6607	6590	6568	6584	6584	6576	6601	6628	6657	6690	6725	6708
39	6613	6602	6588	6556	6542	6507	6496	6461	6482	6482	6481	6500	6527	6559	6589	6620	6613
40	6512	6502	6483	6458	6438	6408	6397	6355	6378	6380	6387	6404	6425	6451	6483	6506	6512
41	6411	6397	6373	6357	6335	6302	6288	6249	6272	6273	6287	6302	6320	6344	6378	6398	6411
42	6305	6290	6255	6252	6224	6189	6173	6143	6156	6163	6182	6191	6213	6233	6274	6288	6305
43	6197	6176	6134	6130	6112	6075	6055	6030	6041	6045	6070	6078	6099	6132	6163	6181	6197
44	6083	6060	6014	6016	5991	5956	5939	5916	5924	5924	5952	5960	5984	6015	6052	6067	6083
45	5966	5941	5894	5897	5871	5837	5817	5796	5807	5807	5826	5847	5868	5896	5933	5959	5966
46	5845	5824	5785	5778	5753	5713	5695	5675	5686	5684	5704	5725	5744	5778	5813	5844	5845
47	5724	5699	5672	5647	5632	5590	5567	5546	5561	5563	5575	5594	5626	5657	5689	5724	5724
48	5595	5576	5551	5514	5503	5465	5437	5420	5431	5431	5454	5470	5511	5535	5564	5590	5595
49	5461	5440	5422	5381	5371	5336	5302	5284	5293	5299	5323	5348	5375	5405	5437	5448	5461
50	5331	5302	5288	5243	5232	5197	5165	5149	5155	5162	5187	5217	5245	5273	5300	5316	5331
51	5198	5163	5150	5104	5097	5055	5028	5014	5016	5025	5048	5077	5110	5139	5160	5182	5198
52	5059	5025	5013	4964	4954	4912	4880	4870	4870	4885	4904	4932	4968	4999	5024	5056	5059
53	4916	4879	4866	4823	4806	4766	4726	4726	4725	4740	4762	4788	4825	4851	4884	4919	4916
54	4778	4734	4715	4676	4653	4616	4579	4576	4585	4593	4618	4645	4680	4707	4740	4777	4778
55	4634	4584	4566	4527	4502	4465	4430	4418	4436	4440	4472	4490	4534	4560	4587	4632	4634
56	4479	4428	4409	4376	4347	4310	4270	4260	4281	4286	4314	4338	4382	4406	4432	4476	4479
57	4332	4274	4255	4221	4198	4158	4110	4105	4118	4131	4155	4183	4227	4255	4274	4320	4332
58	4170	4111	4095	4059	4039	3996	3950	3950	3962	3969	4002	4029	4064	4094	4115	4162	4170
59	4009	3947	3931	3893	3872	3834	3781	3785	3795	3801	3840	3867	3904	3934	3957	4003	4009
60	3846	3788	3768	3736	3700	3666	3614	3613	3629	3635	3676	3705	3738	3770	3792	3837	3846
61	3674	3617	3596	3563	3525	3497	3442	3437	3460	3464	3510	3536	3567	3602	3628	3674	3674

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62	3504	3457	3426	3393	3357	3327	3273	3268	3295	3294	3341	3371	3404	3436	3465	3501	3504
63	3338	3290	3253	3218	3191	3159	3098	3092	3120	3125	3170	3209	3240	3266	3294	3333	3338
64	3164	3117	3081	3043	3015	2983	2923	2916	2945	2953	2996	3036	3070	3097	3124	3163	3164
65	2994	2947	2909	2869	2840	2808	2749	2740	2770	2781	2823	2863	2900	2926	2957	2995	2994
66	2820	2772	2729	2690	2665	2633	2579	2573	2595	2609	2649	2689	2728	2747	2786	2828	2820
67	2648	2599	2549	2515	2494	2460	2417	2409	2428	2445	2477	2519	2559	2570	2615	2657	2648
68	2478	2432	2376	2342	2329	2285	2252	2249	2256	2273	2309	2361	2396	2403	2444	2488	2478
69	2312	2257	2210	2177	2163	2121	2086	2080	2090	2101	2143	2194	2237	2249	2279	2321	2312
70	2135	2084	2054	2017	1995	1959	1921	1912	1920	1942	1975	2031	2055	2087	2113	2148	2135
71	1959	1916	1888	1854	1825	1784	1752	1740	1746	1779	1802	1868	1876	1919	1929	1964	1959
72	1786	1764	1715	1692	1658	1615	1576	1573	1579	1610	1627	1697	1708	1749	1756	1784	1786
73	1602	1591	1547	1520	1481	1458	1406	1403	1412	1436	1464	1534	1555	1589	1585	1617	1602
74	1440	1431	1392	1355	1329	1296	1246	1237	1249	1274	1311	1372	1401	1433	1430	1455	1440
75	1280	1271	1237	1190	1173	1129	1091	1083	1088	1124	1155	1208	1247	1277	1276	1294	1280
76	1119	1111	1079	1048	1014	976	957	935	940	982	998	1054	1094	1120	1122	1132	1119
77	981	971	926	906	881	833	827	797	802	839	856	911	927	952	981	969	981
78	826	827	780	765	730	698	686	673	667	715	729	772	783	817	842	829	826
79	694	684	654	623	601	577	556	547	554	583	612	638	646	680	698	695	694
80	563	556	540	504	475	465	451	430	429	469	495	519	517	553	564	564	563
81	431	441	419	395	379	366	356	340	325	354	374	389	409	431	448	447	431
82	326	328	318	297	281	270	265	249	245	255	290	292	310	317	342	325	326
83	226	226	228	217	204	192	191	175	169	180	193	209	214	223	238	227	226
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94	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2015-07-01	2016-06-30
ST-R-331	Spectral analysis system HAAS-2000	2015-07-01	2016-06-30
D204	Standard Lamp	2015-07-01	2016-06-30
PF2010	Power Meter for Integrating Sphere	2015-07-01	2016-06-30
EE-09	Goniophotometer system	2015-07-01	2016-06-30
D908S	Standard Lamp	2015-07-01	2016-06-30
PF210	Power Meter for Goniophotometer	2015-07-01	2016-06-30
ST-R-181A	Temperature Tester	2015-07-01	2016-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

******* END OF DATASHEET PACKAGE *******