



GZE14
0507-A



NVLAP LAB CODE 201011-0

Report No.: GZE140707-A

LM-79-08 Test Report

For

IGT LIGHTING INC.

(Brand Name: IGT)

3755 Lincoln St. Suite B, Riverside, CA 92503

Two-Foot Linear Replacement Lamps

Model name(s): IGTTU-1101050C-2BC

Model differences: N/A

Test & Report By:

Sean Zhuo

Engineer: Sean Zhuo

Date: Oct.10,2014

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-A/2

Address: 8th floor, Block B, No. 11 Caipin Road, Guangzhou Science City, Tianhe, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <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	Oct.10,2014
Test Report No.	GZE140707-A
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	IGT LIGHTING INC.	
Brand Name	IGT	
Model Number	IGTTU-1101050C-2BC	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Two-Foot Linear Replacement Lamps	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	

Integrating Sphere

Goniophotometer

Electrical Measurements:

Output

Output

Input Wattage	9.008	--	W
Input Current	0.07805	--	A
Input Voltage (ac)	120.0	--	V
Power Factor	0.9619	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	1005	--	lm
Initial Lumen Efficacy	111.57	--	lm/w
Correlated color temperature / CCT	4173	--	K
Color rendering index / CRI	82.8	--	
R9 Value	8	--	
Duv	0.0033	--	

Luminous Intensity Distribution

Center beam candlepower (if applicable)			cd
Beam angle (if applicable)			°
Zonal lumens in the 0°-60° zone	-----	-----	%
Zonal lumens in the 60°-90° zone			%
Zonal lumens in the 90°-120° zone			%
Zonal lumens in the 120°-180° zone			%

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Test Specifications:	
Date of Receipt	: Oct.08,2014
Date of Test	: Oct.09,2014
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	<p>IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</p> <p>ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</p> <p>CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</p> <p>CIE 15-2004 Technical Report Colorimetry</p> <p>IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</p> <p>IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</p>
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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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.

1. Product Information:

Brand Name	IGT
Model Number	IGTTU-1101050C-2BC
Luminaire Type	Two-Foot Linear Replacement Lamps
Rated Voltage / Frequency	100-277Vac,50/60Hz
Nominal Power	10W
Rated Initial Lamp Lumen	--
Declared CCT	4000K
LED Manufacturer	IGT LIGHTING INC.
LED Model	IGTTU-1101050C-2BC
Sample Receipt Date	Oct.08,2014
Sample Number	140707-1,2,3

Photo



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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	2014-10-09	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IGTTU-1101050C-2BC		

Electrical Measurement for Bare Lamp:

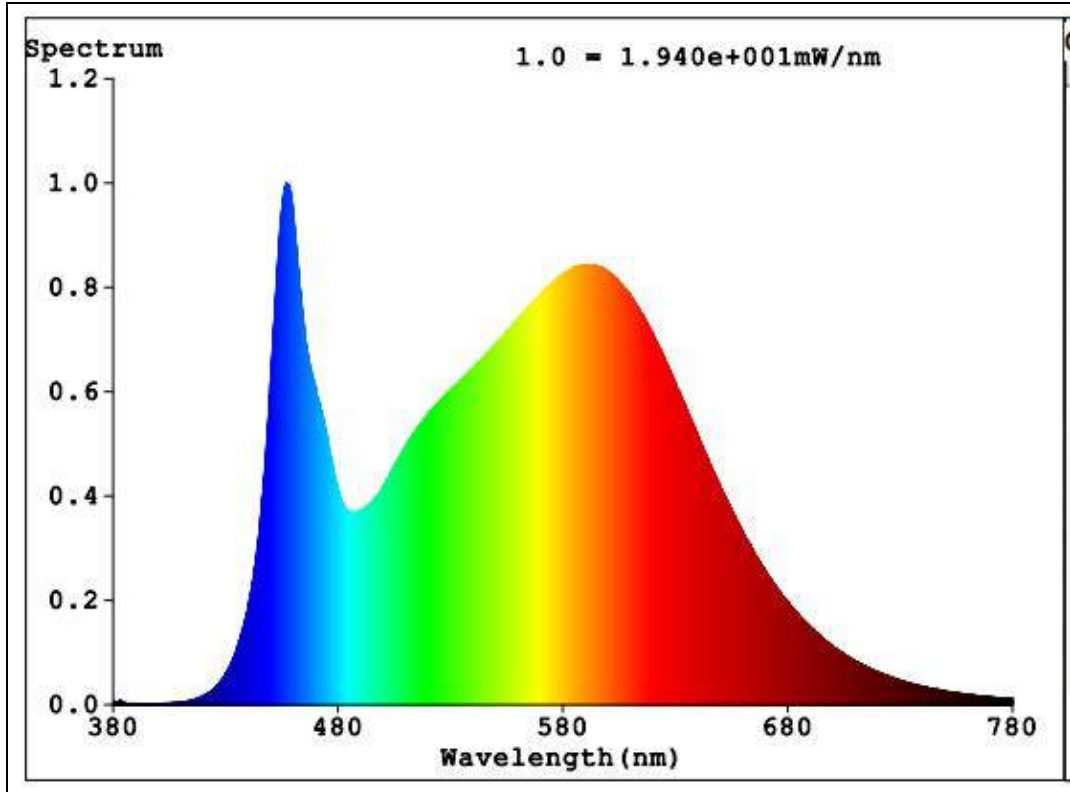
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
140707-1	120.0	60	0.07805	9.008	0.9619	9.89
	277.0	60	0.0365	9.268	0.9166	15.47

Sphere-Spectroradiometer Method for Bare Lamp:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	8
Frequency (Hz)	60	R2	93	R10	82
Color Rendering Index (CRI)	82.8	R3	95	R11	75
R9	8	R4	77	R12	59
CCT (K)	4173	R5	81	R13	85
Chromaticity (x, y)	x=0.3751 y=0.3803	R6	89	R14	98
Chromaticity (u', v')	u'=0.2202 v'=0.5024	R7	83	R15	75
Duv	0.0033	R8	63	--	--
Total Luminous (lm)	1005				
Luminous Efficacy (lm/W)	111.57				

Spectral Power Distribution

Spectral Power Distribution:



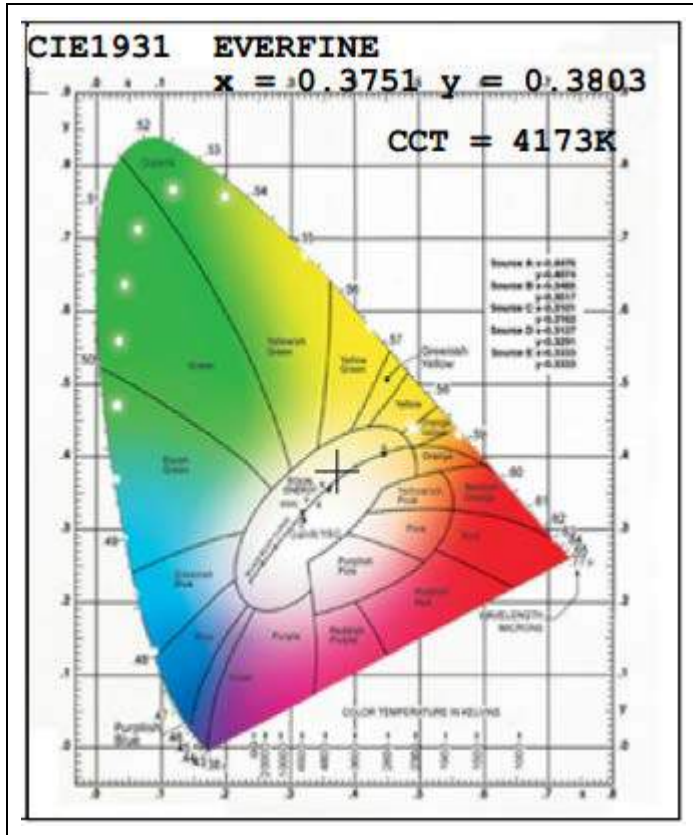
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Chromaticity Diagram



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2.2 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2014-10-09	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IGTTU-1101050C-2BC		

Electrical Measurement for 3-lamp in Luminaire Fixture Lithonia 2GT8 lensed 2x2:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
140707-1,-	120.1	60	0.2359	27.09	0.9561	10.12
2	277.0	60	0.1089	27.26	0.9034	14.73

Color Data for 2-lamp in Luminaire Fixture Lithonia 2GT8 lensed 2x2:

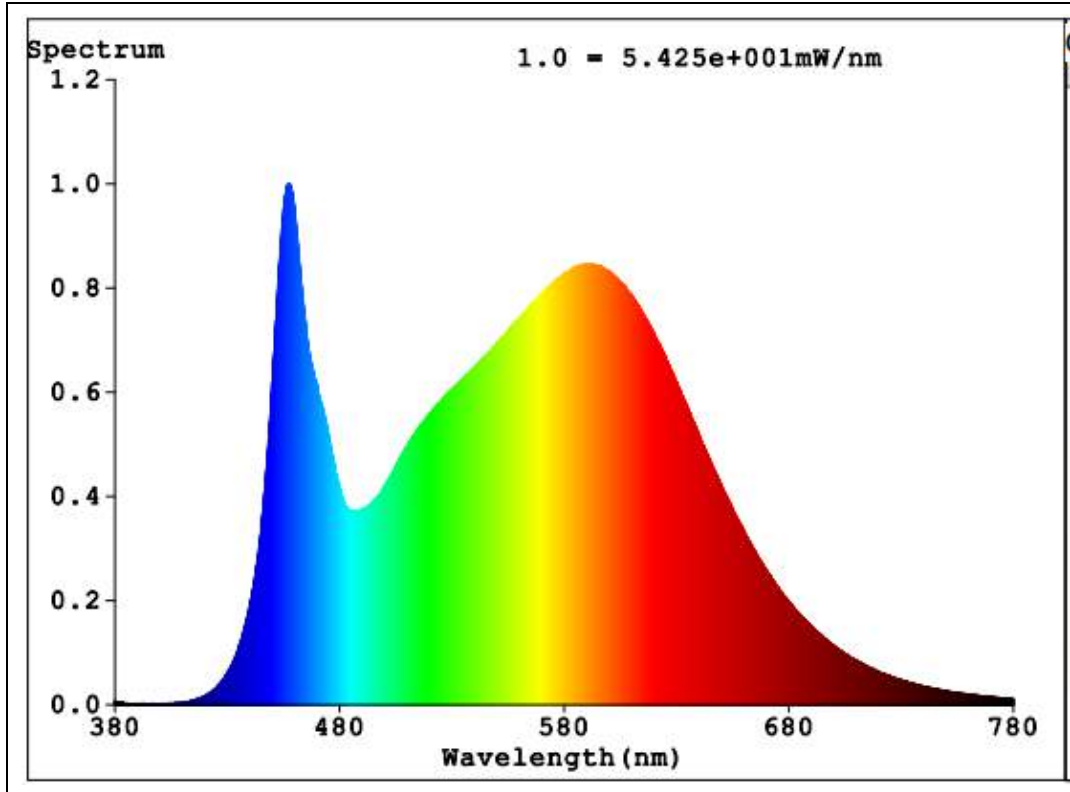
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.1	R1	82	R9	9
Frequency (Hz)	60	R2	93	R10	82
Color Rendering Index (CRI)	82.8	R3	95	R11	75
R9	9	R4	77	R12	60
CCT (K)	4179	R5	81	R13	85
Chromaticity (x, y)	x=0.3748 y=0.3801	R6	89	R14	98
Chromaticity (u', v')	u'=0.2201 v'=0.5022	R7	84	R15	75
Duv	0.0033	R8	63	--	--

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.1
Frequency (Hz)	60
Total Luminous (lm)	2302.1
Luminous Efficacy (lm/W)	84.98
Beam Angle°	93.7
Center Beam Candle Power (cd)	1022
S/MH(C0/180)	1.18
S/MH(C90/270)	1.15

Spectral Power Distribution

Spectral Power Distribution:



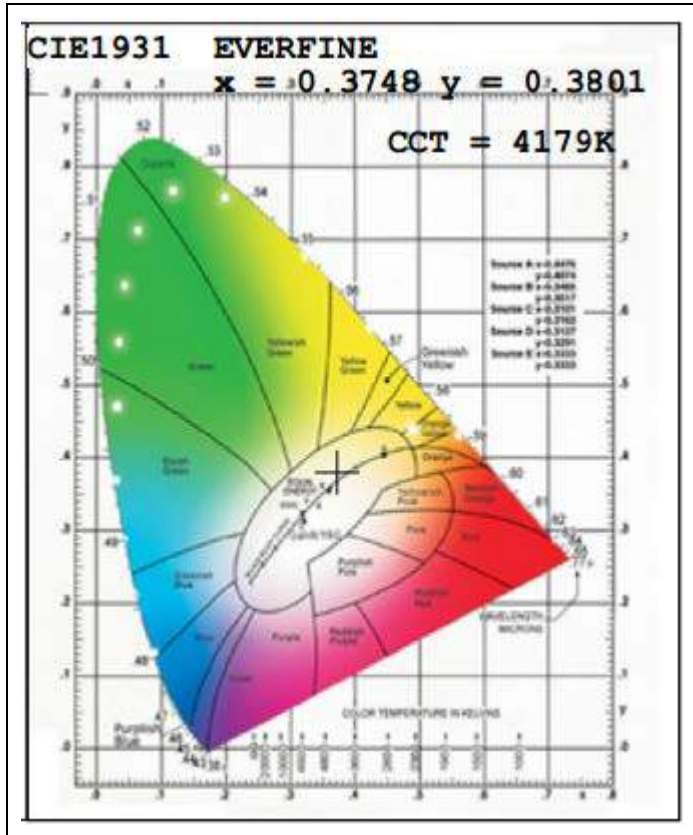
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Chromaticity Diagram



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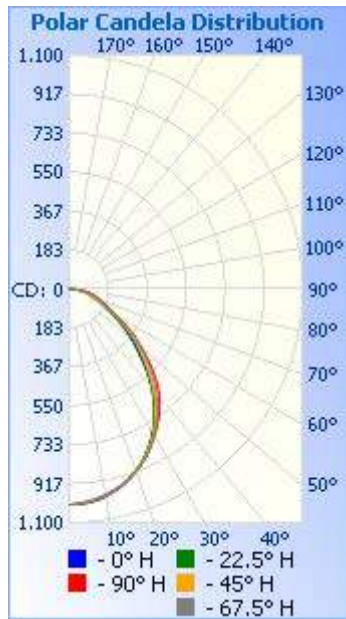
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Zonal Lumen Tabulation

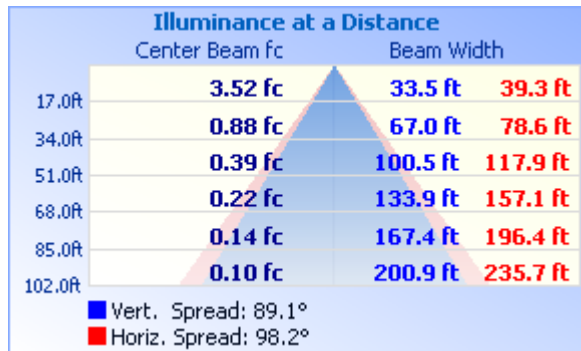
Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Luminaire
0-30	774.9	33.7%	33.7%
0-40	1,235.5	53.7%	53.7%
0-60	1,965.0	85.4%	85.4%
60-90	329.9	14.3%	14.3%
70-100	147.9	6.4%	6.4%
90-120	2.7	0.1%	0.1%
0-90	2,294.9	99.7%	99.7%
90-180	6.9	0.3%	0.3%
0-180	2,301.8	100%	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	96.2	4.2%	90-100	0.6	0%
10-20	273.8	11.9%	100-110	1.0	0%
20-30	404.9	17.6%	110-120	1.0	0%
30-40	460.6	20.0%	120-130	1.1	0%
40-50	421.5	18.3%	130-140	1.0	0%
50-60	308.0	13.4%	140-150	0.9	0%
60-70	182.7	7.9%	150-160	0.6	0%
70-80	109.6	4.8%	160-170	0.4	0%
80-90	37.7	1.6%	170-180	0.1	0%

Photometric Data



Illuminance Plots



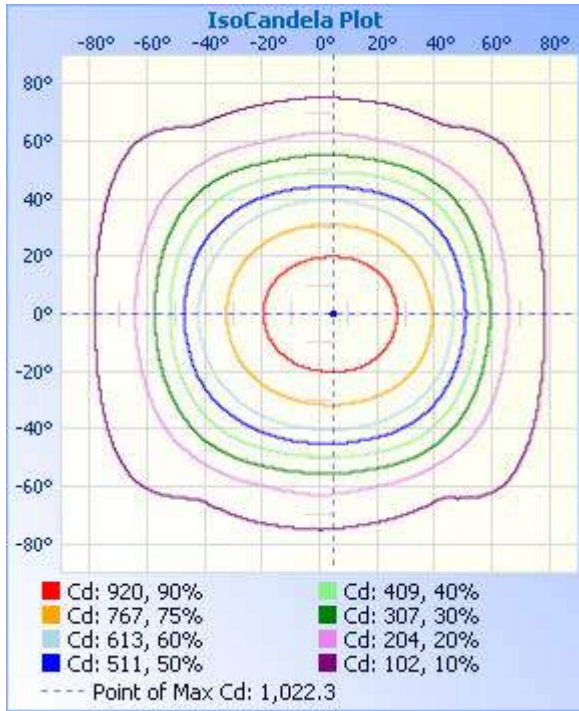
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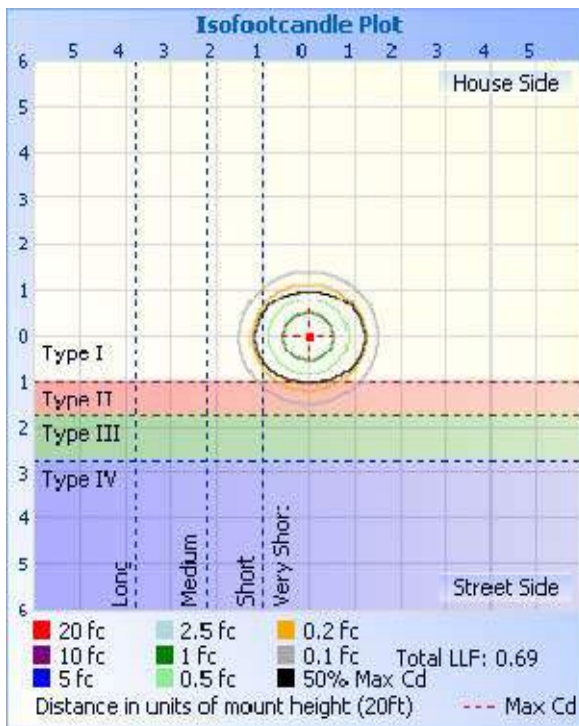
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ISOCANDELA DIAGRAM



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	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019
1	1019	1018	1017	1017	1016	1017	1017	1018	1018	1019	1019	1020	1020	1020	1019	1020	1019
2	1018	1017	1016	1015	1015	1015	1015	1017	1018	1019	1020	1020	1021	1021	1020	1019	1018
3	1017	1015	1014	1013	1012	1013	1013	1015	1017	1018	1020	1021	1022	1022	1020	1019	1017
4	1015	1013	1012	1010	1010	1010	1011	1012	1015	1017	1019	1021	1022	1022	1020	1018	1015
5	1014	1011	1009	1007	1006	1007	1008	1010	1012	1015	1018	1021	1022	1021	1019	1017	1014
6	1011	1008	1006	1004	1003	1004	1004	1006	1008	1013	1017	1020	1022	1021	1018	1015	1011
7	1007	1004	1002	1001	999	1000	1001	1002	1005	1010	1015	1020	1022	1020	1016	1012	1007
8	1004	1000	998	997	995	996	996	997	1001	1006	1013	1018	1021	1019	1014	1009	1004
9	1000	996	994	993	991	992	991	993	996	1003	1010	1017	1019	1018	1012	1006	1000
10	995	991	989	988	986	987	987	988	991	999	1007	1015	1018	1016	1009	1002	995
11	989	985	984	983	981	982	981	981	986	994	1003	1012	1017	1014	1006	997	989
12	984	979	978	978	975	976	975	976	980	989	1000	1010	1014	1012	1002	992	984
13	977	973	972	972	970	970	969	969	973	983	995	1007	1012	1009	997	987	977
14	970	966	966	966	963	963	962	961	967	977	991	1003	1009	1006	993	981	970
15	963	958	959	959	957	957	955	953	959	970	986	999	1006	1002	988	974	963
16	955	950	951	952	950	950	947	945	950	963	980	995	1002	997	983	967	955
17	947	942	943	944	942	942	938	937	943	956	974	990	997	992	977	959	947
18	938	933	934	937	935	934	930	928	933	947	967	985	992	986	971	952	938
19	928	924	925	929	927	925	921	919	924	939	959	978	986	980	963	943	928
20	918	914	916	920	918	916	911	909	914	930	951	971	979	974	955	934	918
21	908	903	906	910	909	906	901	898	903	921	942	963	972	966	947	925	908
22	897	892	896	900	899	896	890	886	892	910	933	955	965	958	938	915	897
23	885	880	885	889	888	885	879	875	881	899	923	946	956	949	928	904	885
24	873	869	874	878	877	873	866	862	869	888	913	937	947	940	918	893	873
25	860	856	861	867	866	861	854	850	856	875	901	927	938	930	907	881	860
26	846	843	848	854	854	849	841	837	842	862	889	917	929	920	896	868	846
27	833	829	835	842	842	836	827	822	828	849	877	906	919	909	883	854	833
28	818	815	820	829	829	823	813	808	814	835	865	894	909	899	870	840	818
29	803	800	806	815	817	810	799	793	800	820	851	883	899	886	857	825	803

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30	788	784	791	801	804	796	784	778	784	805	838	871	888	874	842	810	788
31	773	768	775	787	791	782	770	762	768	789	824	859	878	862	827	794	773
32	757	752	760	772	778	768	754	745	752	773	811	847	866	848	812	777	757
33	740	734	743	758	765	754	739	728	735	756	796	835	855	834	796	760	740
34	723	717	727	743	752	740	723	711	718	739	782	823	843	819	779	743	723
35	706	699	710	728	738	726	707	694	701	722	766	810	830	803	762	725	706
36	687	681	693	712	724	711	690	676	682	704	749	796	816	787	743	707	687
37	669	664	675	695	709	696	673	659	663	686	732	782	801	770	724	688	669
38	649	645	656	677	694	680	656	641	644	668	714	766	786	752	704	668	649
39	629	625	636	659	678	664	638	622	624	650	695	749	770	733	684	647	629
40	608	605	616	640	662	647	619	603	605	630	674	731	754	713	662	626	608
41	587	585	596	621	645	629	598	584	585	610	652	712	736	694	642	605	587
42	566	564	576	602	627	609	577	564	565	588	631	692	717	675	622	583	566
43	543	544	557	583	608	590	556	543	544	566	609	671	696	654	602	562	543
44	521	523	538	564	589	569	535	521	523	543	587	649	673	635	582	542	521
45	498	503	520	545	568	549	515	500	501	521	566	624	649	613	564	523	498
46	476	484	502	527	546	527	496	479	478	499	545	598	623	592	545	504	476
47	455	465	485	508	525	506	477	459	456	479	524	572	598	571	526	485	455
48	436	446	467	490	503	484	458	439	433	458	504	545	573	549	507	466	436
49	417	427	450	472	482	463	439	419	412	439	483	519	548	528	487	447	417
50	399	408	432	453	461	443	422	400	392	419	462	496	525	506	467	428	399
51	382	389	414	434	440	423	403	381	373	399	441	472	502	485	447	408	382
52	365	370	396	415	421	404	384	362	354	378	419	449	479	463	426	388	365
53	348	351	378	397	402	385	366	344	337	359	397	426	455	440	406	368	348
54	332	332	359	378	383	365	347	325	321	339	375	403	431	417	384	349	332
55	316	313	340	359	364	345	329	307	305	319	354	379	406	393	362	329	316
56	301	294	321	338	344	325	311	289	290	299	332	354	380	368	340	309	301
57	286	277	302	318	324	306	292	272	276	280	310	330	354	344	320	291	286
58	272	260	284	299	304	286	274	255	261	261	287	306	330	320	299	273	272
59	258	245	266	280	285	268	255	239	248	244	265	283	307	299	279	256	258
60	245	231	249	263	268	250	236	224	235	227	243	263	286	279	261	241	245
61	233	217	232	247	252	234	218	210	223	211	223	245	267	260	243	226	233

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62	221	205	216	232	237	219	201	196	211	197	204	229	250	244	225	213	221
63	211	193	201	219	224	205	185	183	200	184	187	215	235	229	209	201	211
64	201	183	187	206	211	194	171	172	189	172	171	203	221	215	193	189	201
65	191	173	174	196	200	183	158	161	179	161	157	192	209	203	178	179	191
66	182	163	161	186	189	174	146	152	170	151	145	182	197	192	165	169	182
67	173	154	150	176	180	165	135	143	161	142	133	173	187	183	152	160	173
68	164	145	139	168	171	157	125	136	152	134	123	164	177	173	140	151	164
69	155	138	128	160	163	150	116	129	144	127	114	157	168	164	130	143	155
70	147	130	120	153	156	143	108	122	136	120	107	149	160	156	120	136	147
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72	131	117	104	139	143	131	96	110	121	108	95	135	146	139	105	122	131
73	123	110	98	132	137	124	91	105	114	103	90	129	140	131	99	115	123
74	115	104	93	126	131	118	87	100	107	97	87	122	133	124	93	108	115
75	108	98	88	119	126	112	84	94	101	91	84	116	127	116	89	101	108
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79	83	75	74	92	100	88	70	71	77	68	70	87	95	86	73	74	83
80	76	69	70	85	93	81	66	65	70	62	65	79	86	77	68	68	76
81	69	62	65	78	85	75	62	60	63	55	60	71	75	68	62	61	69
82	61	56	59	71	77	68	57	53	56	49	53	62	65	60	55	54	61
83	53	50	52	64	68	60	50	47	48	43	45	53	54	50	46	47	53
84	44	43	44	56	58	53	43	40	40	36	35	44	44	41	37	40	44
85	36	36	36	46	48	43	35	34	32	29	26	34	33	32	28	33	36
86	28	29	28	37	37	34	26	26	24	21	18	22	21	22	19	25	28
87	19	21	20	26	26	23	18	18	15	12	10	9	8	10	11	16	19
88	11	12	12	15	14	13	10	9	7	4	2	1	1	1	3	7	11
89	2	4	5	5	5	4	3	2	0	1	1	1	0	1	0	1	2
90	0	1	1	1	0	1	1	1	1	1	1	1	0	1	0	0	0

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2014-07-01	2015-06-30
ST-R-331	Spectral analysis system HAAS-2000	2014-07-01	2015-06-30
D204	Standard Lamp	2014-07-01	2015-06-30
PF2010	Power Meter for Integrating Sphere	2014-07-01	2015-06-30
EE-09	Goniophotometer system	2014-07-01	2015-06-30
D908S	Standard Lamp	2014-07-01	2015-06-30
PF210	Power Meter for Goniophotometer	2014-07-01	2015-06-30
ST-R-181A	Temperature Tester	2014-07-01	2015-06-30

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