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Photometric Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-10-2014, IES LM-35-2002 (Withdrawn)
CIE 13.3-1995, CIE 15-2004, ANSI C78.377-2017
IES TM-30-2018

Prepared For
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Catalog Number
HU-LED-TR-X108-NSP-WHP-9-C-1-INC-120-PROTOTYPE(4000K)

Order Number
13318635
Test Number
13318635.04

Test Date

2020-05-13 - 2020-05-14

Prepared By

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Approved By

Eric Gaudreau, Engineering Leader

The results contained in this report pertain only to the tested sample.
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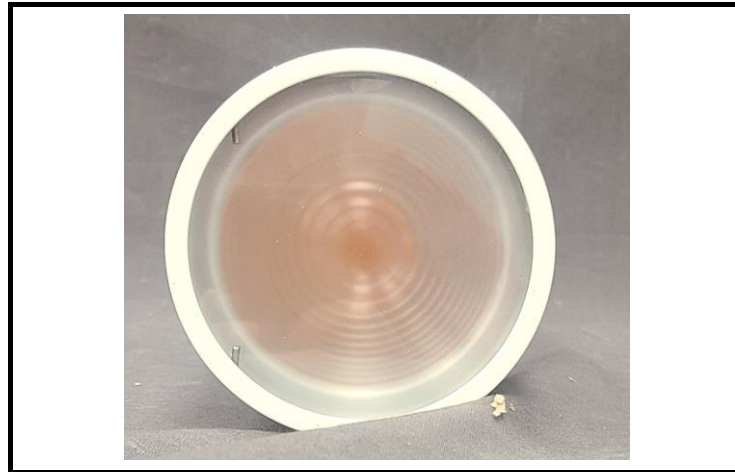
Laboratory results may not be representative of field performance
Ballast factors have not been applied

Testing was performed in a 2-meter integrating sphere using the 4π geometry method.
Absorption correction was employed for Sphere measurement



Luminaire Description: White metal cylindrical housing and clear glass lens
Lamp: One (1) White LED with optic below
Mounting: Pendant
Ballast/Driver: One (1) ERP ESST040W-0900-42

Luminaire



Luminaire Characteristics
Luminous Diameter: 3.50 in.

Summary of Results

Integrating Sphere

Luminous Flux: 1681 Lumens
Efficacy: 47.77 lm/w
CCT: 3807 K
CRI (Ra): 81.7

Distribution

Total Luminaire Output: 1659 Lumens
Luminaire Efficacy: 47.1 lm/w
Maximum Candela: 26118 Candela

Electrical Data at 120 VAC

Test Temperature: 25.0 °C
Voltage: 120.0 VAC
Current: 0.2971 A
Power: 35.19 W
Power Factor: 0.987
Frequency: 60 Hz
Current THD: 12.0 %



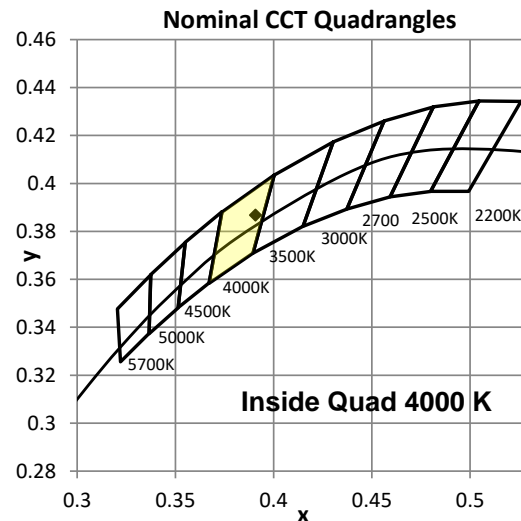
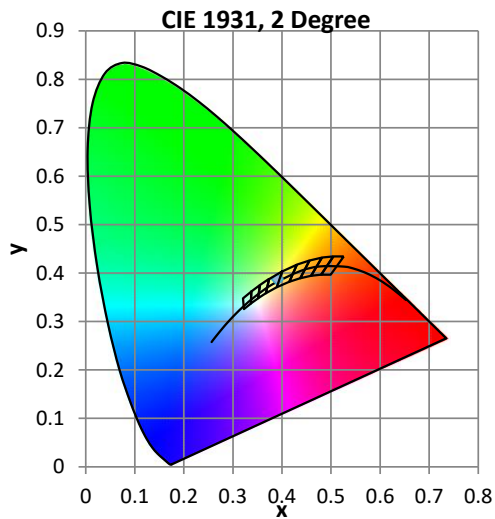
Color Quality - Integrating Sphere

Integrating Sphere Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.0 °C	120.0 VAC	0.2971 A	35.19 W	0.987	60 Hz	12.0 %

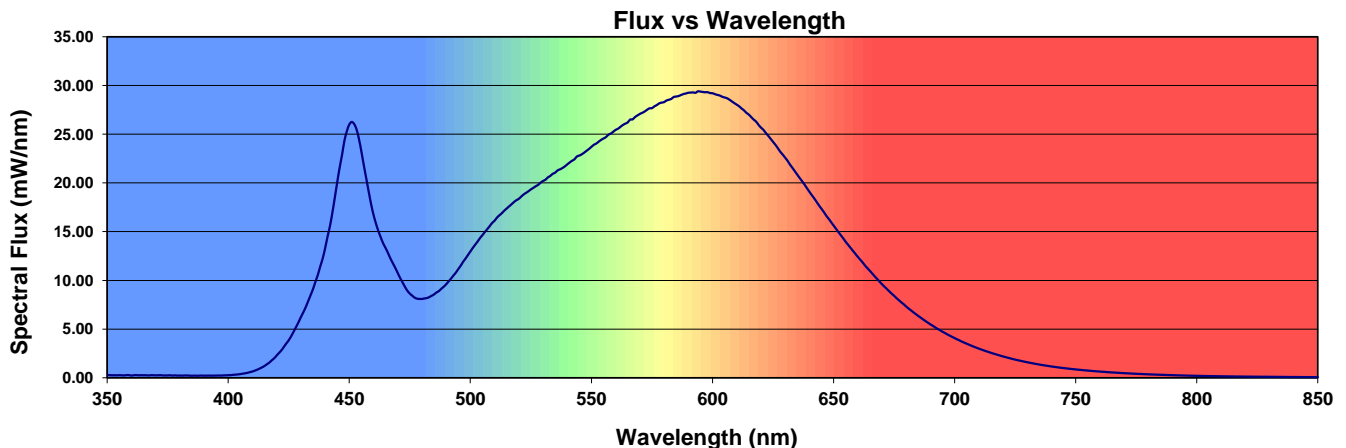
Summary of Results

Total Output:	1681 Lumens	Chromaticity (x):	0.3907
Efficacy:	47.8 lm/w	Chromaticity (y):	0.3868
CCT:	3807 K	Chromaticity (u'):	0.2278
CRI (Ra):	81.7	Chromaticity (v'):	0.5075
CRI (R9):	5.2	TM-30 Rf:	83.9
Peak Wavelength:	595 nm	TM-30 Rg:	95.3
Dominant Wavelength:	579 nm	Duv:	0.0015
S/P Ratio:	1.6		



Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
81.7	79.4	87.8	94.4	80.4	79.4	83.2	85.9	63.0	5.2	71.1	78.3	62.2	81.2	96.8	73.0





Distribution - Goniophotometer

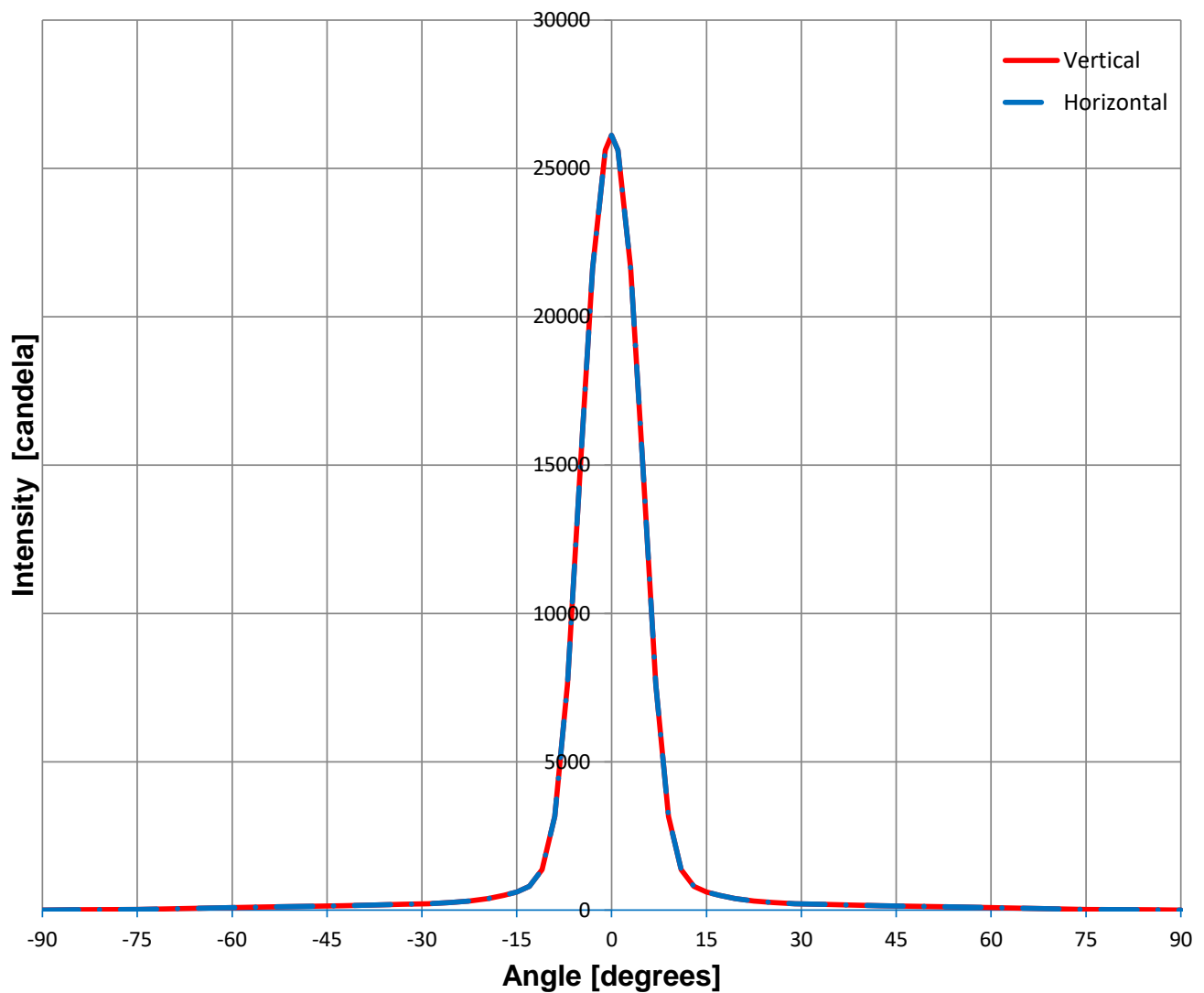
Distribution Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.1 °C	120.0 VAC	0.2972 A	35.20 W	0.987	60 Hz	12.0 %

Summary of Results

Total Lumen Output:	1659.4 Lumens	Maximum Candela:	26118.0 Candela
Luminaire Efficacy:	47.1 Lumens/Watt	Maximum Angle:	0 H 0 V
Field Lumens:	928.2 Lumens	Field Angle :	19.2 H X 19.2 V
Beam Lumens:	555.5 Lumens	Beam Angle :	10.9 H X 10.9 V
Spill Light Lumens:	731.2 Lumens	IESNA Type:	2 H X 2 V

Maximum Candlepower Plot





Candela Tabulation

Lateral Angle (Degrees)

Vertical Angle (Degrees)	Lateral Angle (Degrees)										
	0	1	3	5	7	9	11	13	15	17	19.5
85.0	8	8	8	8	8	8	8	8	8	8	8
75.0	23	23	23	23	23	23	23	22	22	22	21
65.0	59	59	59	59	58	58	57	56	55	54	53
55.0	101	101	101	101	100	99	98	97	96	94	92
47.5	129	129	128	128	127	126	125	124	122	121	118
42.5	150	150	149	149	148	146	145	143	140	138	135
37.5	172	172	171	171	169	168	166	164	161	158	154
33.0	193	192	192	191	189	187	185	182	179	175	171
29.0	216	216	215	213	211	208	204	200	196	191	185
25.5	251	251	249	245	240	234	227	220	214	207	199
22.5	302	302	298	291	282	271	259	247	235	224	213
19.5	387	386	378	365	348	328	307	286	267	249	230
17.0	500	499	487	465	435	399	363	331	302	276	249
15.0	608	606	592	563	525	478	427	377	335	302	267
13.0	799	795	760	693	628	564	502	437	377	331	286
11.0	1362	1346	1218	985	798	670	579	502	427	363	307
9.0	3162	3100	2613	1835	1223	859	670	564	478	399	328
7.0	7604	7419	5999	3900	2153	1223	798	628	525	435	348
5.0	14692	14321	11581	7430	3900	1835	985	693	563	465	365
3.0	21629	21107	17510	11581	5999	2613	1218	760	592	487	378
1.0	25616	24988	21107	14321	7419	3100	1346	795	606	499	386
0.0	26118	25616	21629	14692	7604	3162	1362	799	608	500	387
-1.0	25616	24988	21107	14321	7419	3100	1346	795	606	499	386
-3.0	21629	21107	17510	11581	5999	2613	1218	760	592	487	378
-5.0	14692	14321	11581	7430	3900	1835	985	693	563	465	365
-7.0	7604	7419	5999	3900	2153	1223	798	628	525	435	348
-9.0	3162	3100	2613	1835	1223	859	670	564	478	399	328
-11.0	1362	1346	1218	985	798	670	579	502	427	363	307
-13.0	799	795	760	693	628	564	502	437	377	331	286
-15.0	608	606	592	563	525	478	427	377	335	302	267
-17.0	500	499	487	465	435	399	363	331	302	276	249
-19.5	387	386	378	365	348	328	307	286	267	249	230
-22.5	302	302	298	291	282	271	259	247	235	224	213
-25.5	251	251	249	245	240	234	227	220	214	207	199
-29.0	216	216	215	213	211	208	204	200	196	191	185
-33.0	193	192	192	191	189	187	185	182	179	175	171
-37.5	172	172	171	171	169	168	166	164	161	158	154
-42.5	150	150	149	149	148	146	145	143	140	138	135
-47.5	129	129	128	128	127	126	125	124	122	121	118
-55.0	101	101	101	101	100	99	98	97	96	94	92
-65.0	59	59	59	59	58	58	57	56	55	54	53
-75.0	23	23	23	23	23	23	23	22	22	22	21
-85.0	8	8	8	8	8	8	8	8	8	8	8



Candela Tabulation

Lateral Angle (Degrees)

Vertical Angle (Degrees)	Lateral Angle (Degrees)										
	22.5	25.5	29	33	37.5	42.5	47.5	55	65	75	85
85.0	8	8	8	8	7	7	7	6	4	3	1
75.0	21	20	19	18	17	15	14	12	9	7	3
65.0	51	48	45	42	37	32	28	21	14	9	4
55.0	89	86	81	76	68	59	50	36	21	12	6
47.5	115	111	106	99	91	80	69	50	28	14	7
42.5	130	126	120	113	104	93	80	59	32	15	7
37.5	148	142	134	126	116	104	91	68	37	17	7
33.0	164	157	148	137	126	113	99	76	42	18	8
29.0	178	170	160	148	134	120	106	81	45	19	8
25.5	190	181	170	157	142	126	111	86	48	20	8
22.5	201	190	178	164	148	130	115	89	51	21	8
19.5	213	199	185	171	154	135	118	92	53	21	8
17.0	224	207	191	175	158	138	121	94	54	22	8
15.0	235	214	196	179	161	140	122	96	55	22	8
13.0	247	220	200	182	164	143	124	97	56	22	8
11.0	259	227	204	185	166	145	125	98	57	23	8
9.0	271	234	208	187	168	146	126	99	58	23	8
7.0	282	240	211	189	169	148	127	100	58	23	8
5.0	291	245	213	191	171	149	128	101	59	23	8
3.0	298	249	215	192	171	149	128	101	59	23	8
1.0	302	251	216	192	172	150	129	101	59	23	8
0.0	302	251	216	193	172	150	129	101	59	23	8
-1.0	302	251	216	192	172	150	129	101	59	23	8
-3.0	298	249	215	192	171	149	128	101	59	23	8
-5.0	291	245	213	191	171	149	128	101	59	23	8
-7.0	282	240	211	189	169	148	127	100	58	23	8
-9.0	271	234	208	187	168	146	126	99	58	23	8
-11.0	259	227	204	185	166	145	125	98	57	23	8
-13.0	247	220	200	182	164	143	124	97	56	22	8
-15.0	235	214	196	179	161	140	122	96	55	22	8
-17.0	224	207	191	175	158	138	121	94	54	22	8
-19.5	213	199	185	171	154	135	118	92	53	21	8
-22.5	201	190	178	164	148	130	115	89	51	21	8
-25.5	190	181	170	157	142	126	111	86	48	20	8
-29.0	178	170	160	148	134	120	106	81	45	19	8
-33.0	164	157	148	137	126	113	99	76	42	18	8
-37.5	148	142	134	126	116	104	91	68	37	17	7
-42.5	130	126	120	113	104	93	80	59	32	15	7
-47.5	115	111	106	99	91	80	69	50	28	14	7
-55.0	89	86	81	76	68	59	50	36	21	12	6
-65.0	51	48	45	42	37	32	28	21	14	9	4
-75.0	21	20	19	18	17	15	14	12	9	7	3
-85.0	8	8	8	8	7	7	7	6	4	3	1



Isocandela Diagram (Percent of Maximum Intensity)

