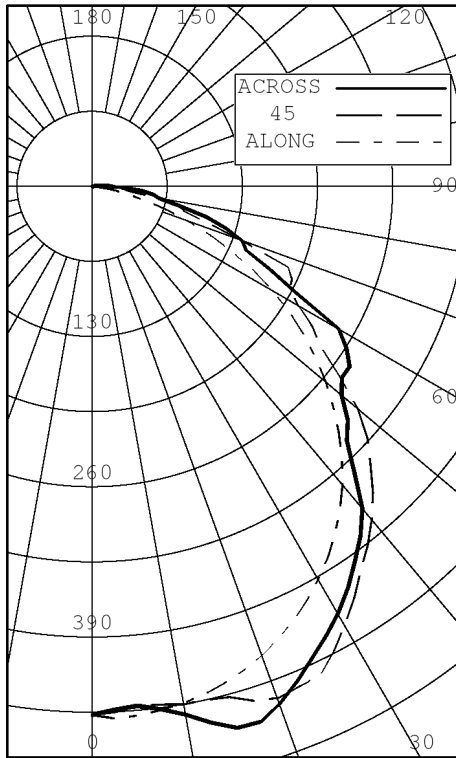




INDEPENDENT TEST LABORATORY REPORT No. 28939

ATG ELECTRONICS - 4' T8 LAMP, CAT# HFL-8260N-120606-L3
WITH WHITE INTERIOR AND CLEAR PLASTIC CURVED LENS
260 LEDS. LUMINAIRE OUTPUT = 1407 LMS
LD20W-36-C0450 DRIVER OPERATING AT 120 VAC AND 16.7 WATTS



INTENSITY (CANDLEPOWER) SUMMARY						OUTPUT LUMENS
ANGLE	ALONG	22.5	45	67.5	ACROSS	
0	457	457	457	457	457	
5	460	454	452	453	451	44
15	445	442	458	481	485	130
25	413	423	467	456	450	204
35	366	410	405	402	396	250
45	302	356	340	320	311	256
55	224	268	240	255	272	227
65	134	170	191	175	170	170
75	49	74	82	102	103	90
85	4	18	27	38	43	30
90	0	5	11	14	15	
95	0	2	3	5	5	5
105	0	0	1	1	1	1
115	0	0	0	0	0	0
125	0	0	0	0	0	0
135	0	0	0	0	0	0
145	0	0	0	0	0	0
155	0	0	0	0	0	0
165	0	0	0	0	0	0
175	0	0	0	0	0	0
180	0	0	0	0	0	0

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	379	26.91
0-40	628	44.65
0-60	1111	79.00
0-90	1401	99.59
40-90	773	54.94
60-90	290	20.59
90-180	6	0.41
0-180	1407	100.00

EFFICACY (LUMENS PER WATT): 84.3

*** THIS IS AN ABSOLUTE TEST ***

LUMINOUS LENGTH: 45.500 INS
WIDTH: 0.875 INS

LUMINANCE SUMMARY CD./SQ.M.

ANGLE	ALONG	45	ACROSS
45	16602	18796	17213
55	15170	16376	18529
65	12298	17625	15706
75	7400	12364	15530
85	1898	12204	19439

S/MH: 1.4
SC (ALONG): 1.3, SC (ACROSS): 1.4

CERTIFIED BY:

Ryder Tannay DATE: APR 26, 2011

PREPARED FOR:

ATG ELECTRONICS
LAKE ELSINORE, CA

TESTED IN ACCORDANCE WITH IES PROCEDURES.

LIGHTING SCIENCES, INC.
 7826 E. EVANS RD.
 SCOTTSDALE, AZ, USA 85260

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INTENSITY (CANDLEPOWER) DATA

ANGLE	PLANE						OUTPUT LUMENS
	ALONG	22.5	45	67.5	ACROSS	AVERAGE	
0	457	457	457	457	457	457	
5	460	454	452	453	451	453	44
10	454	446	455	461	464	455	
15	445	442	458	481	485	462	130
20	431	435	471	482	476	460	
25	413	423	467	456	450	444	204
30	392	419	437	430	426	424	
35	366	410	405	402	396	400	250
40	337	391	376	371	363	372	
45	302	356	340	320	311	331	256
50	264	314	300	284	281	292	
55	224	268	240	255	272	253	227
60	180	220	206	242	246	220	
65	134	170	191	175	170	172	170
70	89	106	137	124	138	120	
75	49	74	82	102	103	84	90
80	20	46	60	56	59	50	
85	4	18	27	38	43	27	30
90	0	5	11	14	15	9	
95	0	2	3	5	5	3	5
100	0	1	3	4	4	2	
105	0	0	1	1	1	1	1
110	0	0	0	1	1	0	
115	0	0	0	0	0	0	0
120	0	0	0	0	0	0	
125	0	0	0	0	0	0	0
130	0	0	0	0	0	0	
135	0	0	0	0	0	0	0
140	0	0	0	0	0	0	
145	0	0	0	0	0	0	0
150	0	0	0	0	0	0	
155	0	0	0	0	0	0	0
160	0	0	0	0	0	0	
165	0	0	0	0	0	0	0
170	0	0	0	0	0	0	
175	0	0	0	0	0	0	0
180	0	0	0	0	0	0	

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AVERAGE LUMINANCE DATA

CD./SQ.M (FOOTLAMBERTS)

ANGLE	ALONG	22.5	45	67.5	ACROSS
0	17804 (5196)	17804 (5196)	17804 (5196)	17804 (5196)	17804 (5196)
30	17615 (5141)	18907 (5518)	19703 (5750)	19377 (5655)	19148 (5588)
40	17109 (4993)	19913 (5812)	19122 (5581)	18883 (5511)	18471 (5391)
45	16602 (4845)	19639 (5732)	18796 (5486)	17693 (5163)	17213 (5024)
50	15968 (4660)	19068 (5565)	18155 (5298)	17254 (5036)	17034 (4971)
55	15170 (4427)	18244 (5324)	16376 (4779)	17363 (5067)	18529 (5408)
60	14031 (4095)	17193 (5018)	16052 (4685)	18888 (5512)	19170 (5595)
65	12298 (3589)	15643 (4565)	17625 (5144)	16205 (4729)	15706 (4584)
70	10159 (2965)	12143 (3544)	15680 (4576)	14122 (4121)	15725 (4589)
75	7400 (2160)	11226 (3276)	12364 (3608)	15365 (4484)	15530 (4532)
80	4495 (1312)	10274 (2998)	13605 (3970)	12550 (3663)	13250 (3867)
85	1898 (554)	8091 (2361)	12204 (3561)	17126 (4998)	19439 (5673)

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COEFFICIENTS OF UTILIZATION

ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE = .20

CC WALL	90				80				70				50				30				10				0
	70	50	30	10	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																									
0	1.221	1.221	1.221	1.22	1.191	1.191	1.191	1.19	1.161	1.161	1.161	1.16	1.111	1.111	1.11	1.061	1.061	1.06	1.021	1.021	1.02	1.00			
1	1.121	1.071	1.030	0.99	1.091	1.051	1.010	0.97	1.071	1.030	0.990	0.96	0.980	0.950	0.93	0.940	0.920	0.90	0.910	0.890	0.87	0.85			
2	1.030	0.950	0.880	0.82	1.000	0.930	0.870	0.81	0.980	0.910	0.850	0.80	0.870	0.820	0.78	0.840	0.800	0.76	0.810	0.780	0.75	0.72			
3	0.940	0.830	0.750	0.69	0.920	0.820	0.740	0.68	0.890	0.800	0.730	0.68	0.780	0.710	0.66	0.750	0.700	0.65	0.720	0.680	0.64	0.62			
4	0.870	0.750	0.660	0.59	0.850	0.730	0.650	0.59	0.830	0.720	0.650	0.58	0.700	0.630	0.58	0.670	0.610	0.57	0.650	0.600	0.56	0.54			
5	0.800	0.670	0.580	0.51	0.780	0.660	0.570	0.51	0.760	0.640	0.560	0.50	0.620	0.550	0.50	0.600	0.540	0.49	0.580	0.530	0.49	0.47			
6	0.740	0.600	0.510	0.44	0.720	0.590	0.500	0.44	0.700	0.580	0.490	0.44	0.560	0.490	0.43	0.540	0.480	0.43	0.530	0.470	0.42	0.40			
7	0.670	0.530	0.440	0.39	0.660	0.520	0.440	0.38	0.640	0.520	0.440	0.38	0.500	0.430	0.37	0.490	0.420	0.37	0.470	0.410	0.37	0.35			
8	0.630	0.480	0.400	0.34	0.610	0.480	0.390	0.33	0.590	0.470	0.390	0.33	0.450	0.380	0.33	0.440	0.380	0.33	0.430	0.370	0.32	0.31			
9	0.580	0.440	0.350	0.29	0.560	0.430	0.350	0.29	0.550	0.430	0.350	0.29	0.410	0.340	0.29	0.400	0.340	0.29	0.390	0.330	0.28	0.27			
10	0.530	0.400	0.310	0.26	0.520	0.390	0.310	0.26	0.510	0.390	0.310	0.26	0.380	0.310	0.26	0.370	0.300	0.25	0.360	0.300	0.25	0.24			

THE ABOVE COEFFICIENTS HAVE BEEN CALCULATED BASED ON LUMINAIRE LUMENS
 BECAUSE IN AN ABSOLUTE TEST THE BARE LAMP LUMENS ARE UNKNOWN.
 LIGHTING DESIGN CALCULATIONS MADE USING THESE COEFFICIENTS SHOULD
 THEREFORE USE THE LUMINAIRE LUMENS IN THE CALCULATION FORMULA

LUMINAIRE INPUT WATTS 16.7

LABORATORY RESULTS MAY NOT BE REPRESENTATIVE OF FIELD PERFORMANCE.
 BALLAST AND FIELD FACTORS HAVE NOT BEEN APPLIED.

TEST DISTANCE EXCEEDS FIVE TIMES THE GREATEST
 LUMINOUS OPENING OF LUMINAIRE.

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ELECTRICAL MEASUREMENTS

INPUT VOLTAGE:	120.0	VOLTS AC
INPUT CURRENT:	0.140	AMPS
INPUT POWER:	16.7	WATTS
POWER FACTOR:	99.4	PERCENT
TOTAL HARMONIC DISTORTION:	11.91	PERCENT
OFF STATE POWER:	0.00	WATTS

LIGHT OUTPUT

LUMENS:	1407	lm
EFFICACY:	84.3	lm/W

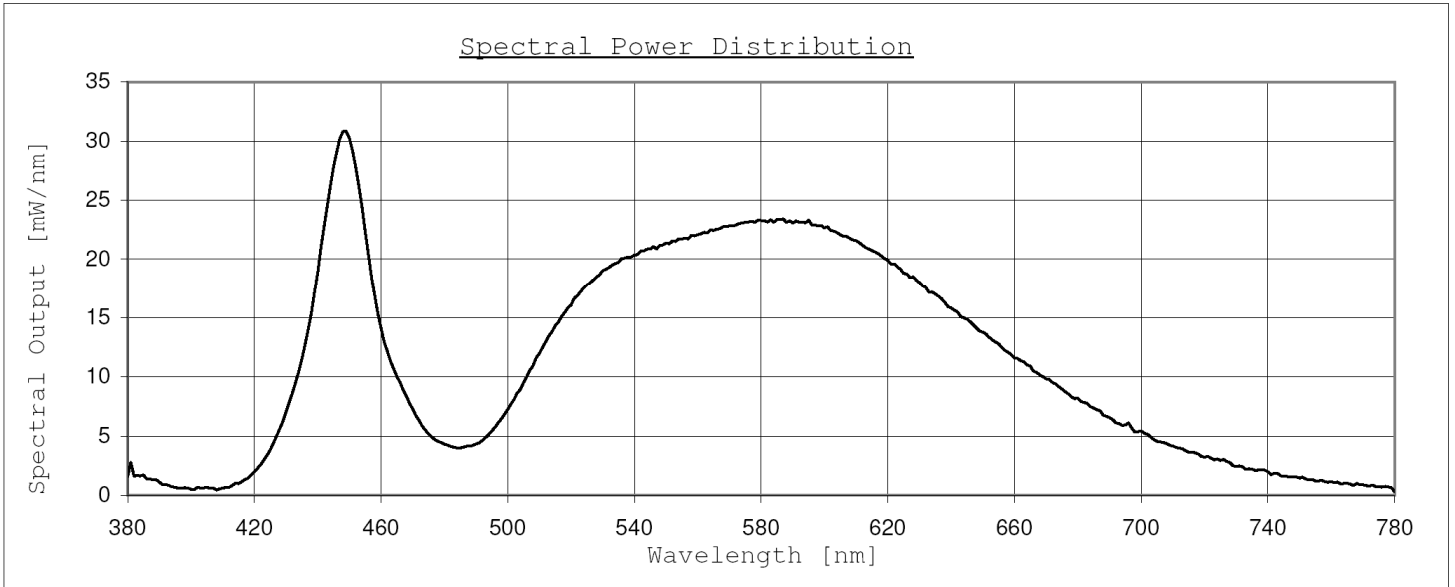
SPECTRAL MEASUREMENTS

X:	0.3744	
y:	0.3694	
u/u':	0.2241	
v:	0.3316	
v':	0.4974	
Duv:	0.0016	
CRI (R _a):	78.3	
CRI (R ₉):	11.7	
CCT:	4113	K
RADIANT FLUX:	4478	mW

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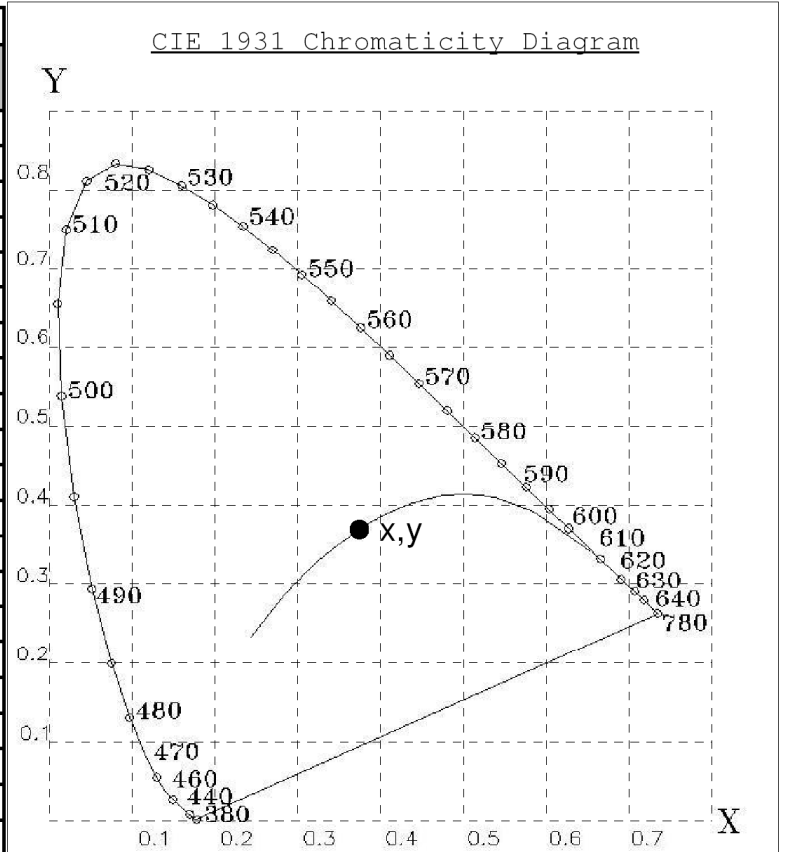
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Tabulated Spectral Power Distribution

Wavelength [nm]	[mW/nm]	Wavelength [nm]	[mW/nm]
380	1.58919	590	23.05465
390	1.12623	600	22.65900
400	0.51800	610	21.57269
410	0.62524	620	19.90224
420	1.98791	630	18.00173
430	7.03445	640	15.81186
440	18.84546	650	13.76892
450	30.24358	660	11.57126
460	14.11354	670	9.82971
470	7.29144	680	8.21501
480	4.31855	690	6.56157
490	4.34312	700	5.43675
500	7.24113	710	4.17069
510	11.97281	720	3.22823
520	16.05350	730	2.44709
530	19.03348	740	1.99783
540	20.34820	750	1.46778
550	21.37900	760	1.16662
560	22.07487	770	0.90396
570	22.82813	780	0.31120
580	23.27597		

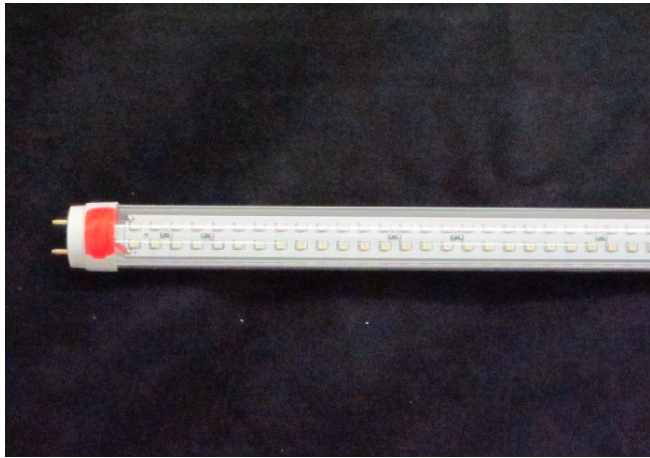


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LUMINOUS OPENING



SIDE VIEW



All testing was conducted in accordance with LM-79-08,

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products as published by the Illuminating Engineering Society of North America (IESNA).

The condition of the item tested was new. Stabilization time before testing exceeded 16 hours.

The test results (luminous distribution and flux) were obtained by using a Lighting Sciences series 6000 Type C Moving Mirror Goniophotometer

The photometric reference standard used is a set of three incandescent luminous intensity standard lamps calibrated and traceable to the U.S. National Institute of Standards and Technology.

The test results (colorimetric and luminous flux) were obtained by using a Lighting Sciences model 4000 Integrating Sphere of either 1 or 2 meters diameter, having an internal reflectance exceeding 0.80. 4π geometry was used. Correction factors were applied for spectral mismatch and self-absorption. The spectroradiometer employed was a LSC model 500E having a bandwidth of .84.

The photometric reference standard used is a set of three incandescent luminous flux standard lamps calibrated and traceable to the U.S. National Institute of Standards and Technology.

The colorimetric reference standard used is an incandescent spectral standard lamp calibrated and traceable to the U.S. National Institute of Standards and Technology.

Power measurements were obtained with a Yokogawa WT210 power analyzer.

Ambient temperature during testing was $25\text{ C} \pm 1\text{ C}$, measured using an Omega model DP460.

Calibration certificates are on file at the laboratories of Lighting Sciences Inc.