

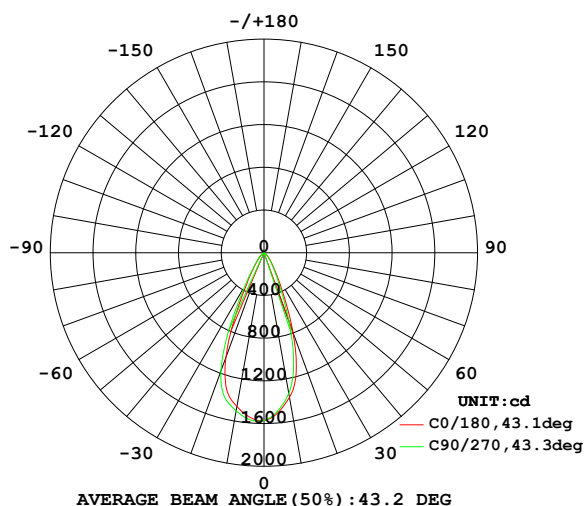
WAC Lighting GONIOPHOTOMETERS SYSTEM TEST REPORT

LUMINAIRE PHOTOMETRIC TEST REPORT

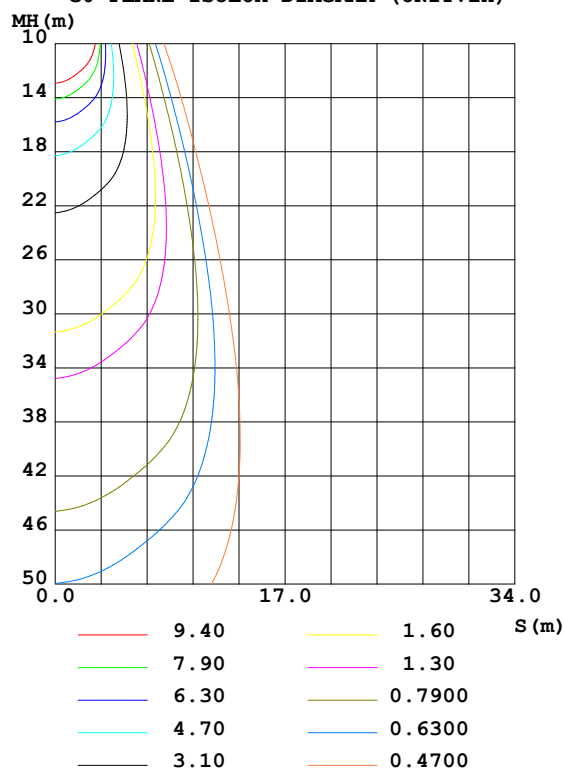
Test:U:120.0V I:0.1228A P:14.59W PF:0.9899 Lamp Flux:913.018x1 lm		
NAME: HR3S-R	TYPE: RECESSED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: WAC Lighting	SUR.:	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 62.59 lm/W			
MODEL	EDC-47C-15W-CRI90	I _{max} (cd)	1587	S/MH (C0/180)	0.68
NOMINAL POWER (W)	15	LOR (%)	100.0	S/MH (C90/270)	0.72
RATED VOLTAGE (V)	120	TOTAL FLUX (lm)	913.02	η UP,DN (C0-180)	0.0, 43.7
NOMINAL FLUX (lm)	913.018	CIE CLASS	DIRECT	η UP,DN (C180-360)	0.0, 56.2
LAMPS INSIDE	1	η up (%)	0.1	CIBSE SHR NOM	0.50
TEST VOLTAGE (V)	120	η down (%)	99.9	CIBSE SHR MAX	0.65

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0 PLANE ISOLUX DIAGRAM (UNIT: lx)



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.4DEG
 Operators: Vito
 Test Date: 2015-07-13

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 50%
 Test Distance: 2.448m [K=1.0000]
 Remarks:

WAC Lighting GONIOPHOTOMETERS SYSTEM TEST REPORT

ZONAL FLUX DIAGRAM

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	$\%lum$
10	1375	1328	1339	1402	1463	1507	1504	1460	0- 10	142.3	142.3	15.6
20	795.7	670.6	690.3	807.4	1046	1191	1180	1032	10- 20	338.8	481.1	52.7
30	234.1	207.5	204.4	232.3	297.0	355.6	354.7	297.5	20- 30	249.1	730.2	80
40	90.97	85.42	83.27	87.89	98.14	104.3	104.7	99.17	30- 40	100.3	830.5	91
50	37.18	35.27	34.37	35.42	38.71	40.19	40.28	39.55	40- 50	47.48	878.0	96.2
60	11.56	11.07	11.19	11.05	11.38	11.74	12.03	11.98	50- 60	19.98	898.0	98.4
70	6.111	6.109	6.045	6.082	6.254	6.283	6.330	6.302	60- 70	8.380	906.3	99.3
80	2.572	2.553	2.519	2.578	2.754	2.776	2.798	2.745	70- 80	4.601	910.9	99.8
90	0.1800	0.3341	0.2098	0.1002	0.2022	0.2256	0.1061	0.0251	80- 90	1.374	912.3	99.9
100	0.0180	0.0368	0	0	0.0066	0.0262	0	0	90-100	0.0812	912.4	99.9
110	0	0.0000	0	0	0	0	0	0	100-110	0.0033	912.4	99.9
120	0	0	0	0	0	0	0	0	110-120	0.0000	912.4	99.9
130	0.0490	0.0649	0.0598	0.0508	0.0474	0.0378	0.0343	0.0424	120-130	0.0132	912.4	99.9
140	0.1438	0.1641	0.1597	0.1475	0.1945	0.1727	0.1686	0.1920	130-140	0.0790	912.5	99.9
150	0.2601	0.2851	0.2810	0.2703	0.3655	0.3479	0.3440	0.3704	140-150	0.1503	912.6	100
160	0.3701	0.3928	0.3943	0.3834	0.5447	0.5414	0.5351	0.5513	150-160	0.1792	912.8	100
170	0.4399	0.4574	0.4674	0.4734	0.6462	0.6586	0.6692	0.6711	160-170	0.1470	913.0	100
180	0.5862	0.6192	0.6354	0.6192	0.5778	0.5960	0.6244	0.6270	170-180	0.0552	913.0	100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

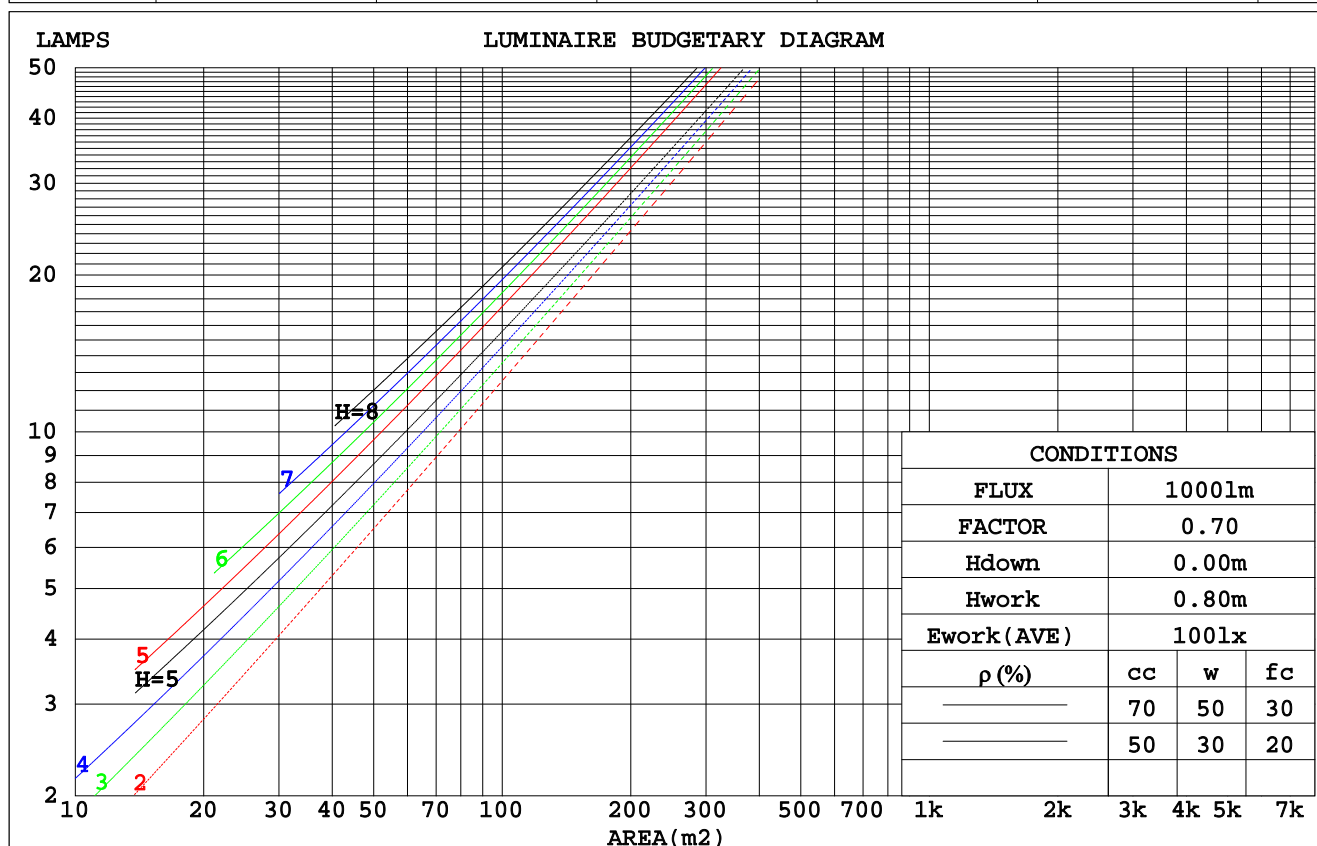
C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.4DEG
 Operators:Vito
 Test Date:2015-07-13

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:50%
 Test Distance:2.448m [K=1.0000]
 Remarks:

WAC Lighting GONIOPHOTOMETERS SYSTEM TEST REPORT

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Coefficients of Utilization(CU)									
0.0	1.19	1.19	1.19	1.16	1.16	1.16	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	.00
1.0	1.11	1.09	1.06	1.09	1.07	1.05	1.05	1.03	1.02	1.01	.00	.99	.98	.97	.96	.94
2.0	1.04	.00	.97	1.02	.99	.96	.99	.96	.94	.96	.94	.92	.93	.91	.90	.88
3.0	.97	.93	.89	.96	.92	.88	.93	.90	.87	.91	.88	.86	.89	.86	.84	.83
4.0	.92	.87	.83	.91	.86	.82	.88	.84	.81	.87	.83	.80	.85	.82	.79	.78
5.0	.87	.81	.77	.86	.81	.77	.84	.80	.76	.82	.78	.75	.81	.77	.75	.73
6.0	.82	.76	.73	.81	.76	.72	.80	.75	.72	.78	.74	.71	.77	.74	.71	.69
7.0	.78	.72	.68	.77	.72	.68	.76	.71	.68	.75	.71	.68	.74	.70	.67	.66
8.0	.74	.69	.65	.74	.68	.65	.72	.68	.64	.71	.67	.64	.71	.67	.64	.63
9.0	.71	.65	.62	.70	.65	.61	.69	.65	.61	.68	.64	.61	.68	.64	.61	.60
10.0	.67	.62	.59	.67	.62	.59	.66	.62	.58	.65	.61	.58	.65	.61	.58	.57



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.4DEG
 Operators: Vito
 Test Date: 2015-07-13

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 50%
 Test Distance: 2.448m [K=1.0000]
 Remarks:

WAC Lighting GONIOPHOTOMETERS SYSTEM TEST REPORT

WEC AND CCEC

pcc	80%			70%			50%			30%			10%			0	
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0	
pfc	20%			20%			20%			20%			20%			0	
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)										
0.0																	
1.0	.172	.098	.031	.165	.094	.030	.153	.088	.028	.141	.081	.026	.131	.076	.024		
2.0	.163	.089	.027	.157	.087	.027	.147	.082	.025	.137	.077	.024	.128	.072	.023		
3.0	.154	.082	.025	.149	.080	.024	.140	.076	.023	.132	.072	.022	.124	.069	.021		
4.0	.146	.076	.022	.142	.074	.022	.134	.071	.021	.127	.068	.021	.120	.065	.020		
5.0	.138	.070	.020	.135	.069	.020	.128	.067	.020	.122	.064	.019	.116	.062	.019		
6.0	.131	.066	.019	.128	.065	.019	.122	.063	.018	.117	.061	.018	.112	.059	.017		
7.0	.125	.062	.018	.122	.061	.017	.117	.059	.017	.112	.058	.017	.108	.056	.016		
8.0	.119	.058	.016	.117	.058	.016	.112	.056	.016	.108	.055	.016	.104	.053	.016		
9.0	.114	.055	.015	.112	.055	.015	.108	.053	.015	.104	.052	.015	.100	.051	.015		
10.0	.109	.052	.015	.107	.052	.014	.104	.051	.014	.100	.050	.014	.097	.049	.014		

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.191	.191	.191	.163	.163	.163	.111	.111	.111	.064	.064	.064	.020	.020	.020	
1.0	.171	.158	.146	.147	.136	.126	.100	.093	.087	.058	.054	.050	.018	.017	.016	
2.0	.156	.133	.114	.133	.115	.099	.091	.079	.069	.053	.046	.040	.017	.015	.013	
3.0	.143	.114	.091	.122	.098	.079	.084	.068	.056	.049	.040	.033	.016	.013	.011	
4.0	.132	.099	.074	.113	.086	.065	.078	.060	.045	.045	.035	.027	.014	.011	.009	
5.0	.123	.088	.061	.105	.076	.053	.073	.053	.038	.042	.031	.022	.014	.010	.007	
6.0	.115	.078	.052	.099	.068	.045	.068	.047	.032	.040	.028	.019	.013	.009	.006	
7.0	.108	.070	.044	.093	.061	.038	.064	.043	.027	.037	.025	.016	.012	.008	.005	
8.0	.102	.064	.038	.088	.056	.033	.061	.039	.023	.035	.023	.014	.011	.008	.005	
9.0	.097	.059	.033	.084	.051	.029	.058	.036	.020	.034	.021	.012	.011	.007	.004	
10.0	.092	.054	.029	.080	.047	.025	.055	.033	.018	.032	.020	.011	.010	.006	.004	

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.4DEG
 Operators: Vito
 Test Date: 2015-07-13

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 50%
 Test Distance: 2.448m [K=1.0000]
 Remarks:

WAC Lighting GONIOPHOTOMETERS SYSTEM TEST REPORT

UGR(Unified Glare Rating) Table

ceiling/cavity	0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
walls	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimensions	Viewed crosswise					Viewed endwise				
x = 2H y = 2H	9.3	10.2	9.5	10.3	10.5	8.9	9.8	9.1	10.0	10.1
3H	9.4	10.2	9.7	10.4	10.6	9.1	9.9	9.3	10.1	10.3
4H	9.5	10.3	9.8	10.5	10.7	9.2	9.9	9.4	10.2	10.4
6H	9.5	10.3	9.8	10.5	10.8	9.2	9.9	9.5	10.2	10.4
8H	9.5	10.2	9.9	10.5	10.8	9.2	9.9	9.5	10.2	10.4
12H	9.5	10.2	9.9	10.5	10.8	9.2	9.9	9.5	10.2	10.4
4H 2H	9.2	10.0	9.5	10.2	10.4	8.9	9.7	9.2	9.9	10.1
3H	9.5	10.1	9.8	10.4	10.7	9.2	9.8	9.5	10.1	10.4
4H	9.6	10.2	9.9	10.5	10.8	9.3	9.9	9.7	10.2	10.5
6H	9.7	10.2	10.1	10.6	10.9	9.4	10.0	9.8	10.3	10.6
8H	9.7	10.2	10.1	10.6	11.0	9.5	10.0	9.9	10.3	10.7
12H	9.8	10.2	10.2	10.6	11.0	9.5	9.9	9.9	10.3	10.7
8H 4H	9.6	10.1	10.0	10.4	10.8	9.3	9.8	9.7	10.1	10.5
6H	9.8	10.2	10.2	10.6	11.0	9.5	9.9	9.9	10.3	10.7
8H	9.8	10.2	10.3	10.6	11.0	9.6	9.9	10.0	10.3	10.8
12H	9.9	10.2	10.3	10.6	11.1	9.6	9.9	10.1	10.4	10.8
12H 4H	9.5	10.0	9.9	10.4	10.8	9.3	9.7	9.7	10.1	10.5
6H	9.7	10.1	10.2	10.5	11.0	9.5	9.8	9.9	10.3	10.7
8H	9.8	10.1	10.3	10.6	11.0	9.6	9.9	10.0	10.3	10.8
Variations with the observer position at spacings:										
S = 1.0H	+ 1.5 / - 2.3					+ 1.4 / - 2.2				
1.5H	+ 2.2 / - 2.1					+ 1.9 / - 2.0				
2.0H	+ 3.2 / - 2.2					+ 2.9 / - 2.1				

CIE Pub.117 Corrected 913.0 lm Total Lamp Luminous Flux.(8log(F/F0) = -0.3)

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.4DEG
Operators:Vito
Test Date:2015-07-13

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:50%
Test Distance:2.448m [K=1.0000]
Remarks:

WAC Lighting GONIOPHOTOMETERS SYSTEM TEST REPORT

UTILIZATION FACTORS TABLE

REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
k = 0.60	86	79	75	85	79	75	85	79	75	71
0.80	93	87	83	93	87	83	92	86	83	79
1.00	98	92	89	97	92	88	96	92	88	84
1.25	102	97	93	101	96	93	99	95	92	88
1.50	105	100	97	104	99	96	102	98	95	91
2.00	108	104	100	107	103	100	104	101	98	93
2.50	110	106	103	108	105	102	105	102	100	94
3.00	111	108	105	110	106	104	106	104	102	95
4.00	113	111	108	111	109	107	108	106	104	97
5.00	115	112	110	113	111	109	109	107	106	98
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.4DEG
 Operators: Vito
 Test Date: 2015-07-13

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 50%
 Test Distance: 2.448m [K=1.0000]
 Remarks:

WAC Lighting GONIOPHOTOMETERS SYSTEM TEST REPORT

ISOCANDELA DIAGRAM

Conical surface Flux(90deg):

858.53 lm

%lum = 94.0%

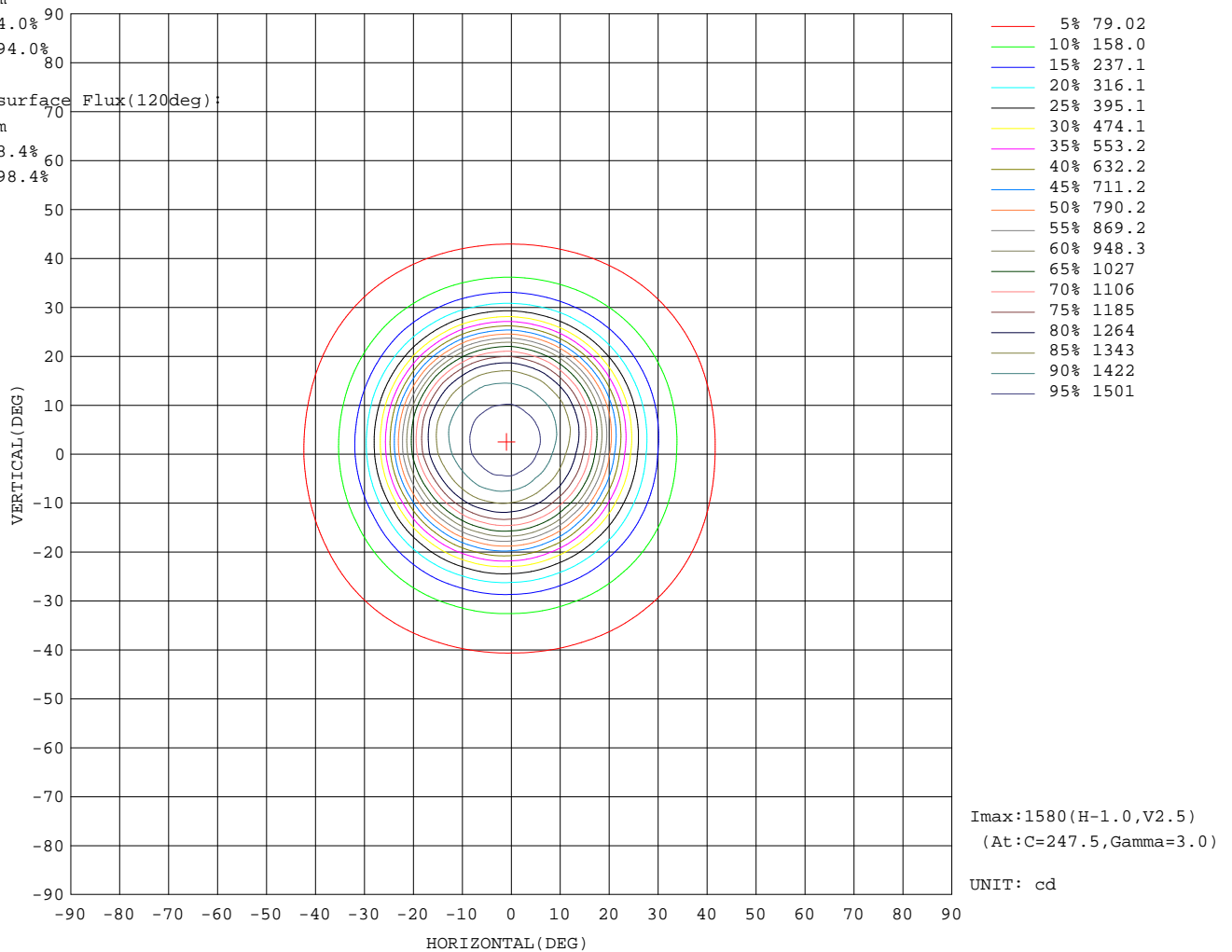
%lamp = 94.0%

Conical surface Flux(120deg):

897.96 lm

%lum = 98.4%

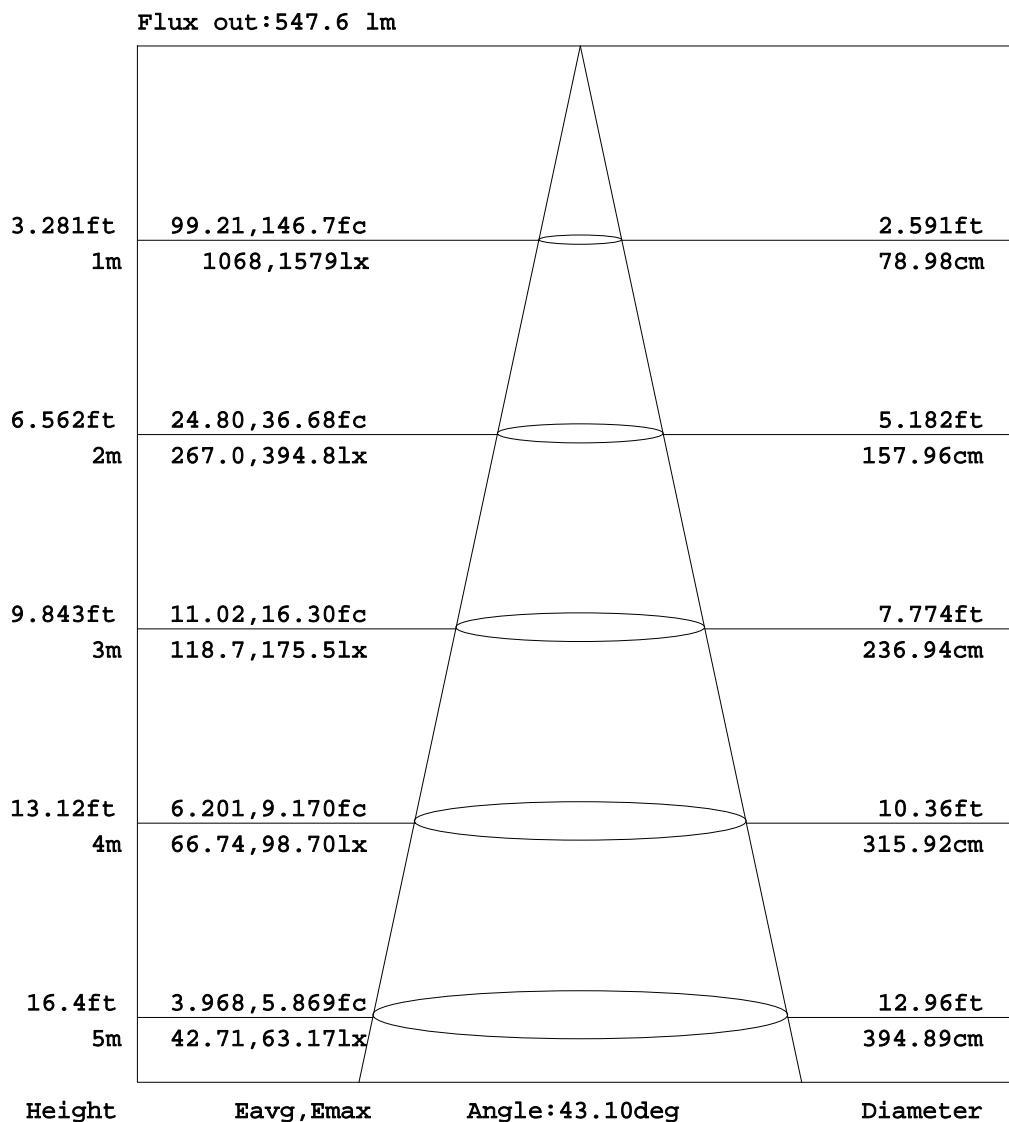
%lamp = 98.4%



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.4DEG
Operators:Vito
Test Date:2015-07-13

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:50%
Test Distance:2.448m [K=1.0000]
Remarks:

AAI Figure



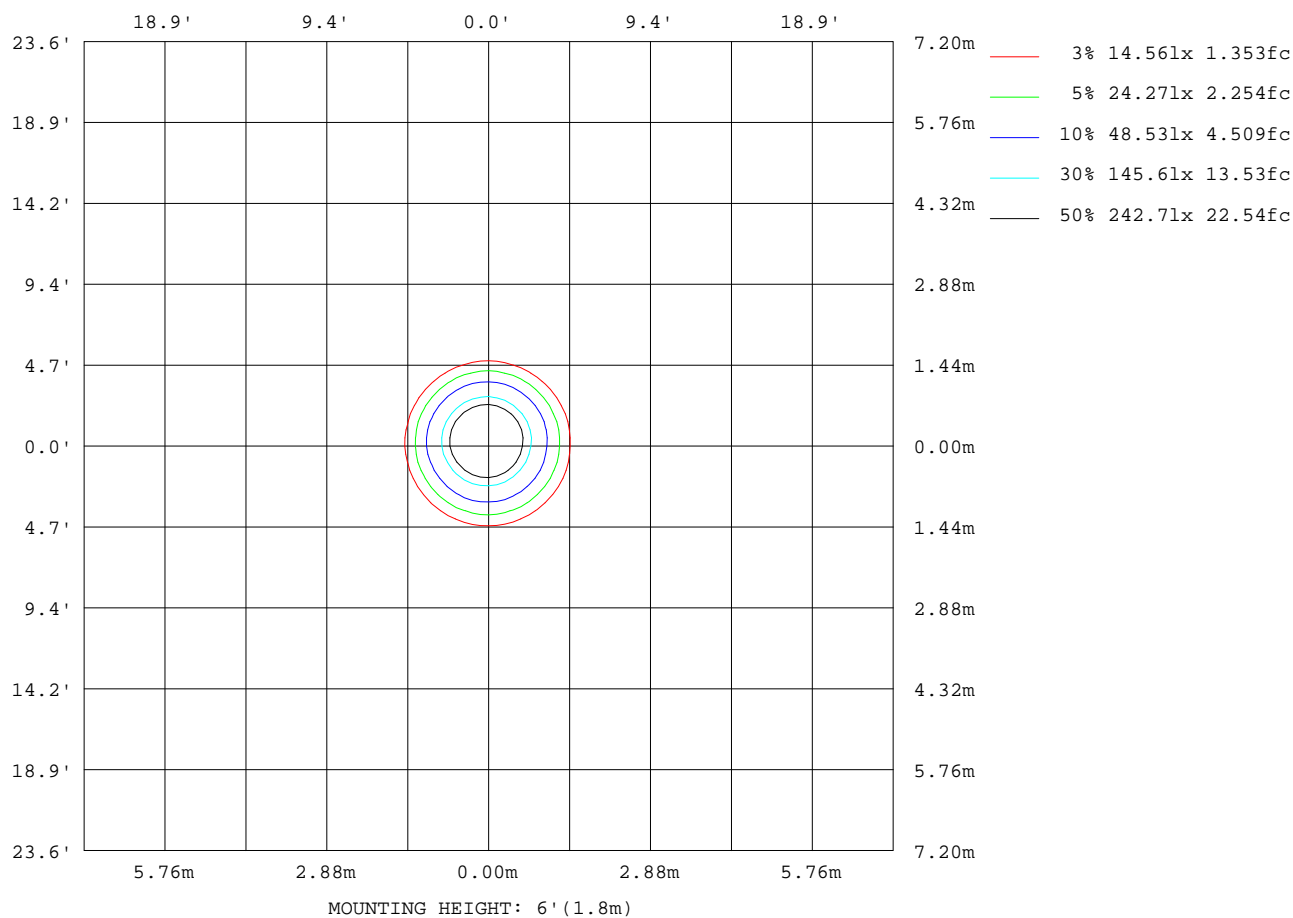
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature: 25.4DEG
Operators: Vito
Test Date: 2015-07-13

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity: 50%
Test Distance: 2.448m [K=1.0000]
Remarks:

WAC Lighting GONIOPHOTOMETERS SYSTEM TEST REPORT

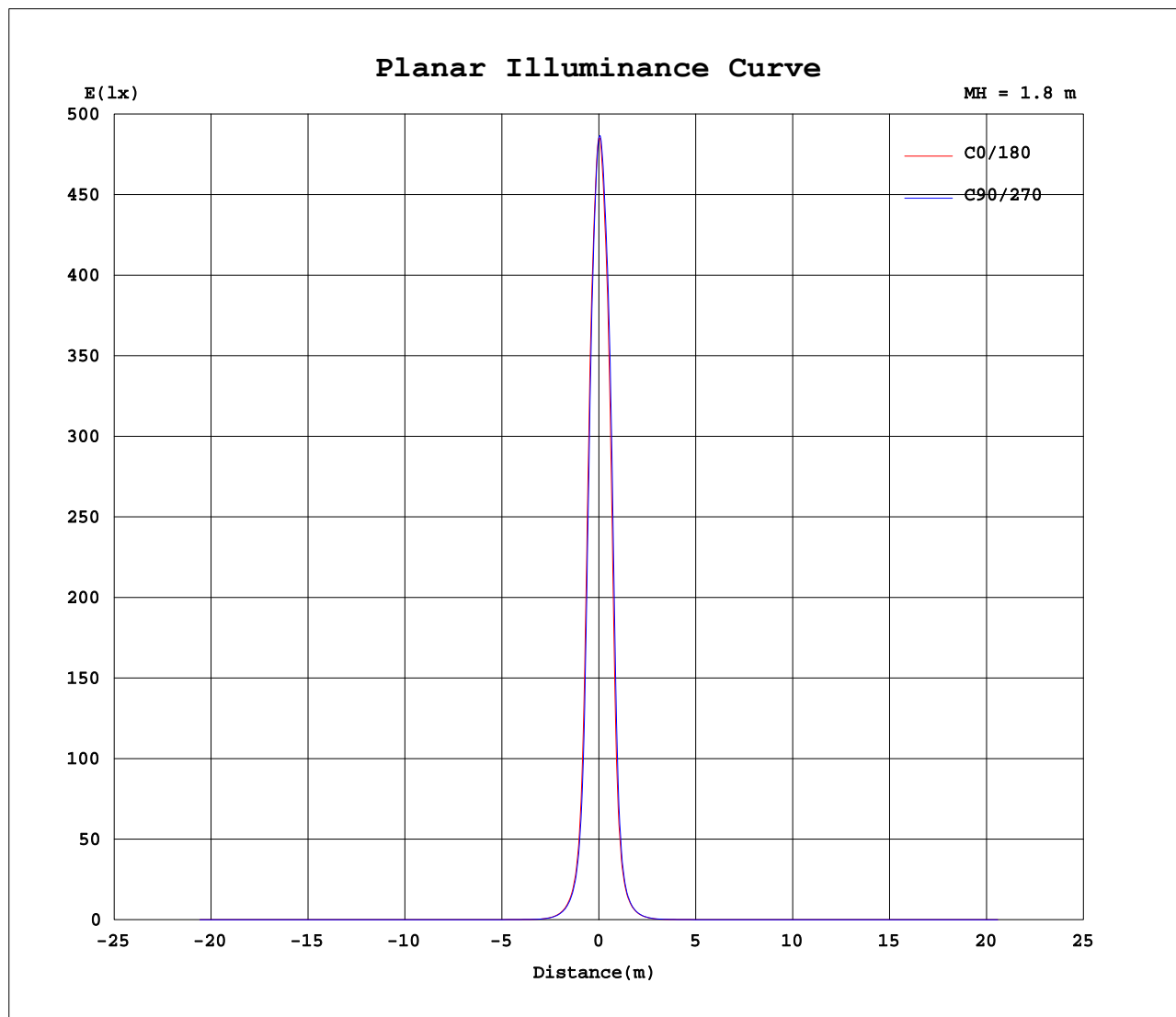
ISOLUX DIAGRAM



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature: 25.4DEG
Operators: Vito
Test Date: 2015-07-13

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity: 50%
Test Distance: 2.448m [K=1.0000]
Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.4DEG
 Operators: Vito
 Test Date: 2015-07-13

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 50%
 Test Distance: 2.448m [K=1.0000]
 Remarks:

WAC Lighting GONIOPHOTOMETERS SYSTEM TEST REPORT

LUMINOUS DISTRIBUTION INTENSITY DATA

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338			
0	1571	1571	1571	1571	1571	1571	1571	1571	1571	1571	1571	1571	1571	1571	1571	1571			
5	1504	1487	1476	1488	1487	1491	1519	1530	1545	1556	1563	1577	1567	1552	1550	1528			
10	1375	1344	1328	1328	1339	1368	1402	1430	1463	1486	1507	1509	1504	1485	1460	1424			
15	1165	1103	1061	1063	1075	1109	1181	1255	1339	1389	1415	1427	1408	1378	1339	1261			
20	796	713	671	668	690	736	807	910	1046	1135	1191	1199	1180	1123	1032	926			
25	435	390	362	359	367	390	435	497	600	684	740	765	743	681	603	518			
30	234	218	207	203	204	215	232	255	297	330	356	363	355	330	298	272			
35	140	134	128	127	126	129	137	146	162	173	180	184	181	173	163	153			
40	91.0	87.9	85.4	83.7	83.3	85.0	87.9	92.0	98.1	102	104	105	105	103	99.2	95.9			
45	59.2	57.6	55.8	55.1	54.6	55.2	56.7	58.5	62.0	63.7	64.7	65.3	65.0	64.3	63.3	62.0			
50	37.2	36.3	35.3	34.7	34.4	34.8	35.4	36.3	38.7	39.6	40.2	40.3	40.3	40.1	39.5	39.2			
55	21.2	20.6	19.9	19.8	19.6	19.6	20.1	20.7	22.6	22.9	23.2	23.5	23.5	23.4	23.2	23.0			
60	11.6	11.2	11.1	11.1	11.2	10.9	11.0	11.2	11.4	11.5	11.7	11.9	12.0	12.1	12.0	11.8			
65	8.31	8.25	8.23	8.26	8.18	8.15	8.19	8.22	8.37	8.36	8.41	8.51	8.51	8.52	8.56	8.50			
70	6.11	6.08	6.11	6.11	6.04	6.07	6.08	6.09	6.25	6.25	6.28	6.32	6.33	6.34	6.30	6.29			
75	4.25	4.21	4.22	4.23	4.20	4.20	4.24	4.27	4.41	4.40	4.43	4.48	4.46	4.45	4.44	4.40			
80	2.57	2.55	2.55	2.55	2.52	2.55	2.58	2.61	2.75	2.76	2.78	2.80	2.80	2.78	2.75	2.71			
85	1.12	1.09	1.08	1.09	1.07	1.10	1.14	1.18	1.29	1.31	1.32	1.34	1.32	1.30	1.27	1.23			
90	0.18	0.29	0.33	0.30	0.21	0.13	0.10	0.14	0.20	0.23	0.23	0.17	0.11	0.05	0.03	0.05			
95	0.08	0.11	0.10	0.06	0.01	0.00	0.00	0.01	0.06	0.10	0.10	0.08	0.02	0.00	0.00	0.04			
100	0.02	0.04	0.04	0.02	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.01	0.00	0.00	0.00	0.00			
105	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
125	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01		
130	0.05	0.06	0.06	0.06	0.06	0.06	0.05	0.04	0.05	0.04	0.04	0.03	0.03	0.04	0.04	0.05			
135	0.09	0.10	0.11	0.11	0.11	0.10	0.09	0.09	0.11	0.10	0.10	0.09	0.09	0.10	0.11	0.12			
140	0.14	0.16	0.16	0.17	0.16	0.15	0.15	0.14	0.19	0.18	0.17	0.17	0.17	0.18	0.19	0.21			
145	0.21	0.22	0.23	0.23	0.22	0.22	0.21	0.20	0.28	0.26	0.26	0.25	0.25	0.26	0.28	0.30			
150	0.26	0.27	0.29	0.29	0.28	0.28	0.27	0.26	0.37	0.36	0.35	0.35	0.34	0.35	0.37	0.39			
155	0.31	0.33	0.34	0.34	0.34	0.33	0.32	0.31	0.46	0.46	0.45	0.45	0.44	0.45	0.47	0.48			
160	0.37	0.38	0.39	0.40	0.39	0.39	0.38	0.37	0.54	0.54	0.54	0.54	0.54	0.54	0.55	0.56			
165	0.42	0.43	0.45	0.45	0.45	0.45	0.44	0.44	0.61	0.61	0.61	0.61	0.61	0.62	0.62	0.63			
170	0.44	0.45	0.46	0.46	0.47	0.47	0.47	0.47	0.65	0.65	0.66	0.67	0.67	0.67	0.67	0.67			
175	0.51	0.52	0.53	0.54	0.54	0.54	0.53	0.52	0.63	0.63	0.65	0.67	0.67	0.67	0.67	0.65			
180	0.59	0.60	0.62	0.63	0.64	0.63	0.62	0.61	0.58	0.58	0.60	0.62	0.62	0.63	0.63	0.62			

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature: 25.4DEG
Operators: Vito
Test Date: 2015-07-13

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity: 50%
Test Distance: 2.448m [K=1.0000]
Remarks: