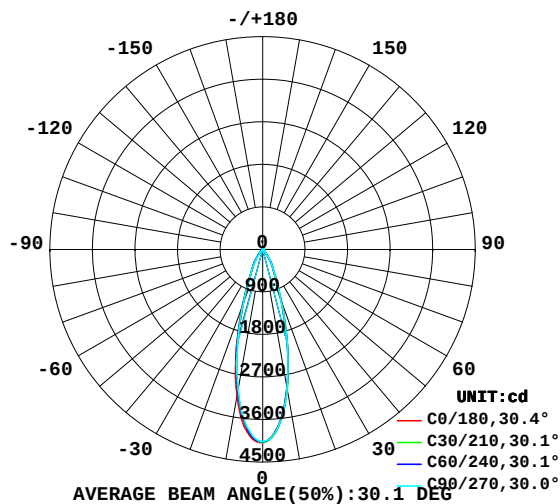


LUMINAIRE PHOTOMETRIC TEST REPORT

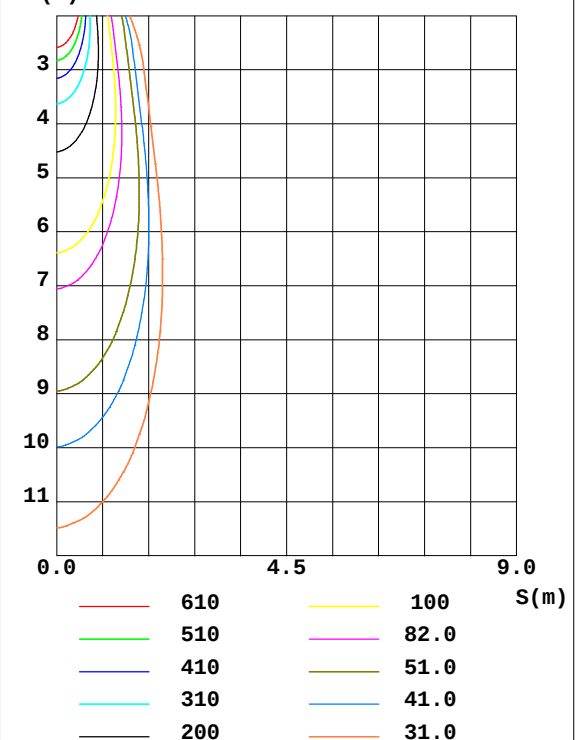
Test:U:220.9V I:0.0980A P:21.00W PF:0.9620 Lamp Flux:1468.82x1 lm		
NAME: 20W 2700K	TYPE:LED	
MFR.:		

DATA OF LAMP		PHOTOMETRIC DATA				Eff: 69.94 lm/W
MODEL	20W 2700K	I _{max} (cd)	4086	S/MH(C0/180)	0.49	
NOMINAL POWER(W)	20	LOR(%)	100.0	S/MH(C90/270)	0.49	
RATED VOLTAGE(V)	220	TOTAL FLUX(lm)	1468.8	η UP, DN(C0-180)	1.5, 46.8	
NOMINAL FLUX(lm)	1468.82	CIE CLASS	DIRECT	η UP, DN(C180-360)	1.7, 50.0	
LAMPS INSIDE	1	η up(%)	3.2	CIBSE SHR NOM	0.50	
TEST VOLTAGE(V)	220.9	η down(%)	96.8	CIBSE SHR MAX	0.50	

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0 PLANE ISOLUX DIAGRAM (UNIT: lx)



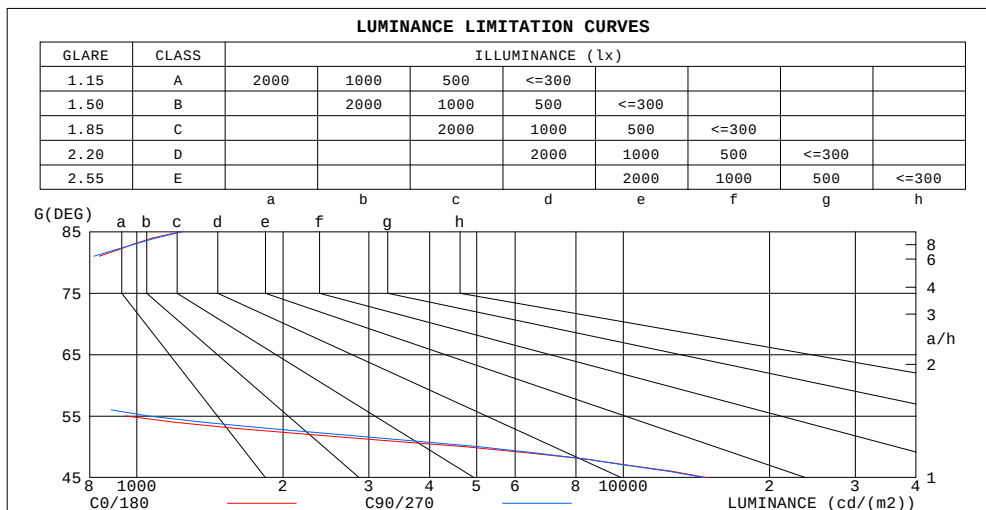
C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2017-03-10

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE G0-2000B_V1 SYSTEM V2.0.267
 Humidity: 65.0%
 Test Distance: 8.000m [K=0.7063]
 Remarks:

ZONAL FLUX DIAGRAM AND LUMINANCE LIMITATION CURVES

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	2970	2995	2988	2939	3153	3040	3008	3104	0- 10	336.9	336.9	22.9,22.9
20	1150	1147	1128	1087	1250	1201	1207	1285	10- 20	558.4	895.3	61,61
30	413.8	416.5	406.7	383.0	417.3	420.1	415.4	442.3	20- 30	314.6	1210	82.4,82.4
40	120.4	120.0	115.8	107.2	129.6	130.6	96.60	141.5	30- 40	157.5	1367	93.1,93.1
50	14.85	15.70	15.87	14.55	22.55	21.50	7.239	21.78	40- 50	44.05	1411	96.1,96.1
60	1.466	1.425	1.491	1.491	2.382	2.404	2.078	2.277	50- 60	4.782	1416	96.4,96.4
70	0.8991	0.8618	0.8941	0.9279	2.269	2.282	1.790	2.111	60- 70	1.641	1418	96.5,96.5
80	0.6518	0.6325	0.6331	0.6730	2.675	2.665	2.310	2.531	70- 80	1.633	1420	96.6,96.6
90	0.4896	0.4949	0.4915	0.5020	2.857	2.827	2.798	2.776	80- 90	1.765	1421	96.8,96.8
100	1.062	1.045	1.034	1.079	3.293	3.268	3.231	3.207	90-100	2.052	1423	96.9,96.9
110	2.375	2.317	2.286	2.389	4.132	4.140	4.102	4.041	100-110	2.759	1426	97.1,97.1
120	4.790	4.695	4.658	4.805	5.807	5.820	5.758	5.666	110-120	4.113	1430	97.4,97.4
130	8.352	8.212	8.115	8.317	8.233	8.232	8.125	8.006	120-130	5.936	1436	97.8,97.8
140	12.40	12.23	12.12	12.36	11.73	11.67	11.43	11.37	130-140	7.699	1444	98.3,98.3
150	16.60	16.40	16.22	16.47	16.06	15.91	15.45	15.54	140-150	8.730	1453	98.9,98.9
160	20.49	20.29	20.02	20.18	20.10	19.56	18.87	19.08	150-160	8.299	1461	99.5,99.5
170	22.20	22.10	21.81	21.67	21.90	20.98	20.24	20.27	160-170	5.877	1467	99.9,99.9
180	22.95	22.27	21.66	21.51	22.00	22.27	21.62	21.52	170-180	2.053	1469	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT: lm		



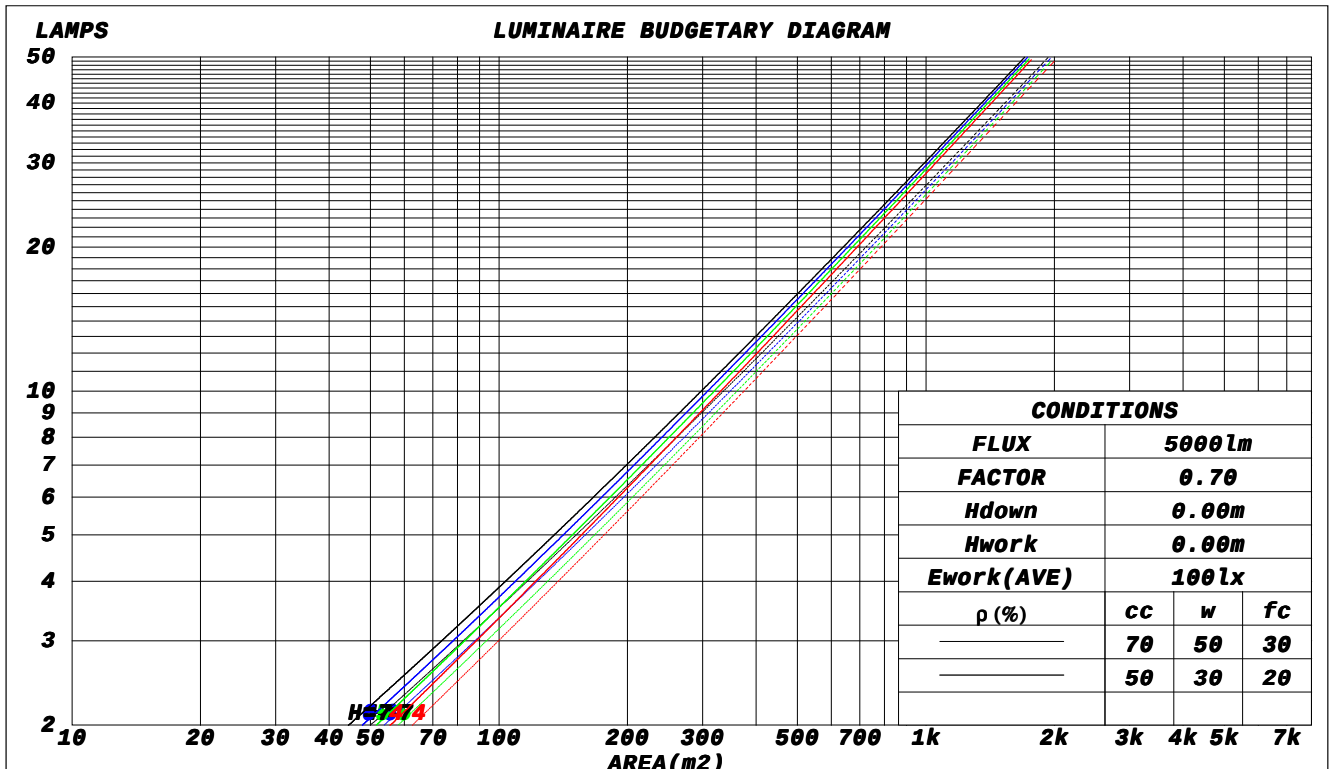
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-10

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System: EVERFINE G0-2000B_V1 SYSTEM V2.0.267
Humidity: 65.0%
Test Distance: 8.000m [K=0.7063]
Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:220.9V I:0.0980A P:21.00W PF:0.9620 Lamp Flux:1468.82x1 lm		
NAME: 20W 2700K	TYPE:LED	
MFR.:		

ρ_{CC}	80%			70%			50%			30%			10%			0
ρ_W	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρ_{fc}	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Coefficients of Utilization(CU)									
0.0	1.18	1.18	1.18	1.15	1.15	1.15	1.09	1.09	1.09	1.04	1.04	1.04	.99	.99	.99	.97
1.0	1.11	1.09	1.07	1.09	1.07	1.05	1.04	1.02	1.01	.99	.99	.97	.96	.95	.94	.92
2.0	1.05	1.01	.98	1.03	.99	.97	.99	.96	.94	.96	.93	.92	.92	.91	.89	.88
3.0	.99	.95	.91	.97	.93	.90	.94	.91	.88	.92	.89	.87	.89	.87	.85	.83
4.0	.94	.89	.86	.92	.88	.85	.90	.86	.84	.88	.85	.82	.86	.83	.81	.80
5.0	.89	.84	.81	.88	.84	.80	.86	.82	.79	.84	.81	.78	.82	.80	.77	.76
6.0	.85	.80	.77	.84	.80	.76	.82	.78	.75	.81	.77	.75	.79	.76	.74	.73
7.0	.81	.76	.73	.81	.76	.73	.79	.75	.72	.78	.74	.71	.76	.73	.71	.70
8.0	.78	.73	.70	.77	.73	.69	.76	.72	.69	.75	.71	.68	.74	.70	.68	.67
9.0	.75	.70	.67	.74	.70	.66	.73	.69	.66	.72	.68	.66	.71	.68	.65	.64
10.0	.72	.67	.64	.71	.67	.64	.70	.66	.63	.70	.66	.63	.69	.65	.63	.62



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2017-03-10

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.267
 Humidity: 65.0%
 Test Distance: 8.000m [K=0.7063]
 Remarks:

WEC AND CCEC

Test:U:220.9V I:0.0980A P:21.00W PF:0.9620 Lamp Flux:1468.82x1 lm											
NAME: 20W 2700K						TYPE:LED					
MFR.:											

ρ_{CC}	80%			70%			50%			30%			10%			0	
ρ_W	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0	
ρ_{fc}	20%			20%			20%			20%			20%			0	
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)										
0.0																	
1.0	.159	.090	.029	.151	.086	.027	.137	.078	.025	.123	.071	.023	.111	.064	.021		
2.0	.149	.081	.025	.142	.078	.024	.130	.072	.022	.119	.067	.021	.109	.061	.019		
3.0	.140	.074	.022	.134	.072	.022	.124	.067	.020	.114	.063	.019	.106	.058	.018		
4.0	.132	.069	.020	.127	.067	.020	.118	.063	.019	.110	.059	.018	.102	.056	.017		
5.0	.125	.064	.018	.121	.062	.018	.113	.059	.017	.106	.056	.017	.099	.053	.016		
6.0	.119	.060	.017	.115	.058	.017	.108	.056	.016	.102	.053	.016	.096	.050	.015		
7.0	.113	.056	.016	.110	.055	.016	.104	.053	.015	.098	.050	.015	.093	.048	.014		
8.0	.108	.053	.015	.105	.052	.015	.100	.050	.014	.095	.048	.014	.090	.046	.013		
9.0	.103	.050	.014	.101	.049	.014	.096	.047	.013	.091	.046	.013	.087	.044	.013		
10.0	.099	.048	.013	.097	.047	.013	.092	.045	.013	.088	.044	.012	.084	.042	.012		

ρ_{CC}	80%			70%			50%			30%			10%			0
ρ_W	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρ_{fc}	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.215	.215	.215	.184	.184	.184	.125	.125	.125	.072	.072	.072	.023	.023	.023	
1.0	.195	.182	.171	.167	.156	.147	.114	.108	.102	.066	.062	.059	.021	.020	.019	
2.0	.178	.158	.140	.153	.136	.121	.105	.094	.085	.060	.055	.050	.019	.018	.016	
3.0	.165	.139	.118	.141	.120	.102	.097	.083	.072	.056	.048	.042	.018	.016	.014	
4.0	.153	.124	.101	.132	.107	.088	.090	.074	.062	.052	.044	.037	.017	.014	.012	
5.0	.144	.112	.088	.123	.097	.077	.085	.068	.054	.049	.040	.032	.016	.013	.011	
6.0	.136	.102	.078	.117	.088	.068	.080	.062	.048	.047	.036	.029	.015	.012	.009	
7.0	.129	.094	.070	.111	.082	.061	.076	.057	.043	.044	.034	.026	.014	.011	.009	
8.0	.123	.088	.064	.105	.076	.056	.073	.054	.040	.042	.032	.024	.014	.010	.008	
9.0	.117	.083	.059	.101	.072	.052	.070	.050	.037	.041	.030	.022	.013	.010	.007	
10.0	.112	.078	.055	.097	.068	.048	.067	.048	.034	.039	.028	.020	.013	.009	.007	

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2017-03-10

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.267
Humidity:65.0%
Test Distance:8.000m [K=0.7063]
Remarks:

Uncorrected UGR Table

Test:U:220.9V I:0.0980A P:21.00W PF:0.9620 Lamp Flux:1468.82x1 lm										
NAME: 20W 2700K					TYPE:LED					
MFR.:										
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	15.7	16.4	15.9	16.6	16.8	15.5	16.2	15.7	16.5	16.7
3H	15.5	16.2	15.8	16.4	16.7	15.3	16.0	15.6	16.3	16.5
4H	15.4	16.1	15.7	16.3	16.6	15.2	15.9	15.5	16.2	16.4
6H	15.3	15.9	15.6	16.2	16.5	15.1	15.8	15.5	16.1	16.4
8H	15.3	15.9	15.6	16.2	16.5	15.1	15.7	15.4	16.0	16.3
12H	15.2	15.8	15.6	16.1	16.5	15.0	15.6	15.4	15.9	16.3
4H 2H	15.4	16.1	15.7	16.3	16.6	15.2	15.9	15.5	16.2	16.4
3H	15.2	15.8	15.6	16.1	16.4	15.0	15.6	15.4	15.9	16.3
4H	15.1	15.6	15.5	16.0	16.4	14.9	15.5	15.3	15.8	16.2
6H	15.0	15.5	15.4	15.9	16.3	14.8	15.3	15.3	15.7	16.1
8H	15.0	15.4	15.4	15.8	16.2	14.8	15.2	15.2	15.6	16.1
12H	14.9	15.3	15.4	15.7	16.2	14.7	15.1	15.2	15.6	16.0
8H 4H	14.9	15.4	15.4	15.8	16.2	14.8	15.2	15.2	15.6	16.0
6H	14.8	15.2	15.3	15.6	16.1	14.7	15.0	15.1	15.5	16.0
8H	14.8	15.1	15.3	15.6	16.1	14.6	14.9	15.1	15.4	15.9
12H	14.7	15.0	15.3	15.5	16.0	14.6	14.8	15.1	15.3	15.9
12H 4H	14.9	15.3	15.3	15.7	16.2	14.7	15.1	15.2	15.5	16.0
6H	14.8	15.1	15.3	15.6	16.1	14.6	14.9	15.1	15.4	15.9
8H	14.7	15.0	15.3	15.5	16.0	14.6	14.8	15.1	15.3	15.9
Variations with the observer position at spacings:										
S = 1.0H	+ 3.4 / -14.2					+ 3.3 / -13.9				
1.5H	+ 5.6 / -13.9					+ 5.5 / -13.6				
2.0H	+ 7.4 / - 8.0					+ 7.4 / - 8.0				

CIE Pub.117 Corrected 1469 lm Total Lamp Luminous Flux. (8log(F/F0) = 1.3)

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2017-03-10

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.267
Humidity:65.0%
Test Distance:8.000m [K=0.7063]
Remarks:

UTILIZATION FACTORS TABLE

Test:U:220.9V I:0.0980A P:21.00W PF:0.9620 Lamp Flux:1468.82x1 lm		
NAME: 20W 2700K	TYPE: LED	
MFR.:		

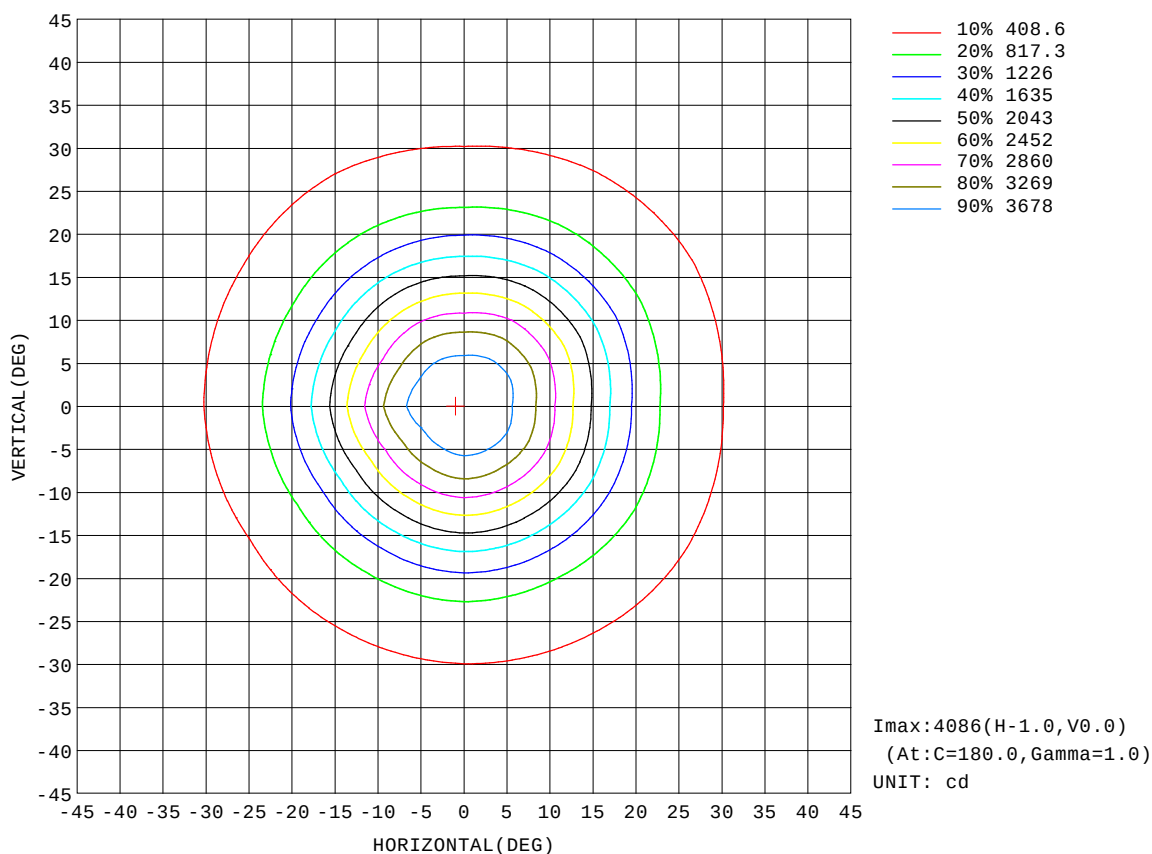
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	87	81	77	87	81	77	86	80	77	74
0.80	95	89	85	94	88	85	92	88	84	81
1.00	99	93	90	98	93	89	96	92	89	84
1.25	103	98	94	101	97	94	99	95	93	88
1.50	105	101	97	104	100	97	101	98	95	90
2.00	108	104	101	106	102	100	103	100	98	92
2.50	109	106	103	108	104	102	104	101	99	93
3.00	111	108	105	109	106	104	105	103	101	94
4.00	113	110	108	111	108	106	107	105	103	95
5.00	114	112	110	112	110	108	107	106	105	96
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-10

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System: EVERFINE G0-2000B_V1 SYSTEM V2.0.267
Humidity: 65.0%
Test Distance: 8.000m [K=0.7063]
Remarks:

ISOCANDELA DIAGRAM

Test:U:220.9V I:0.0980A P:21.00W PF:0.9620 Lamp Flux:1468.82x1 lm		
NAME: 20W 2700K	TYPE: LED	
MFR.:		



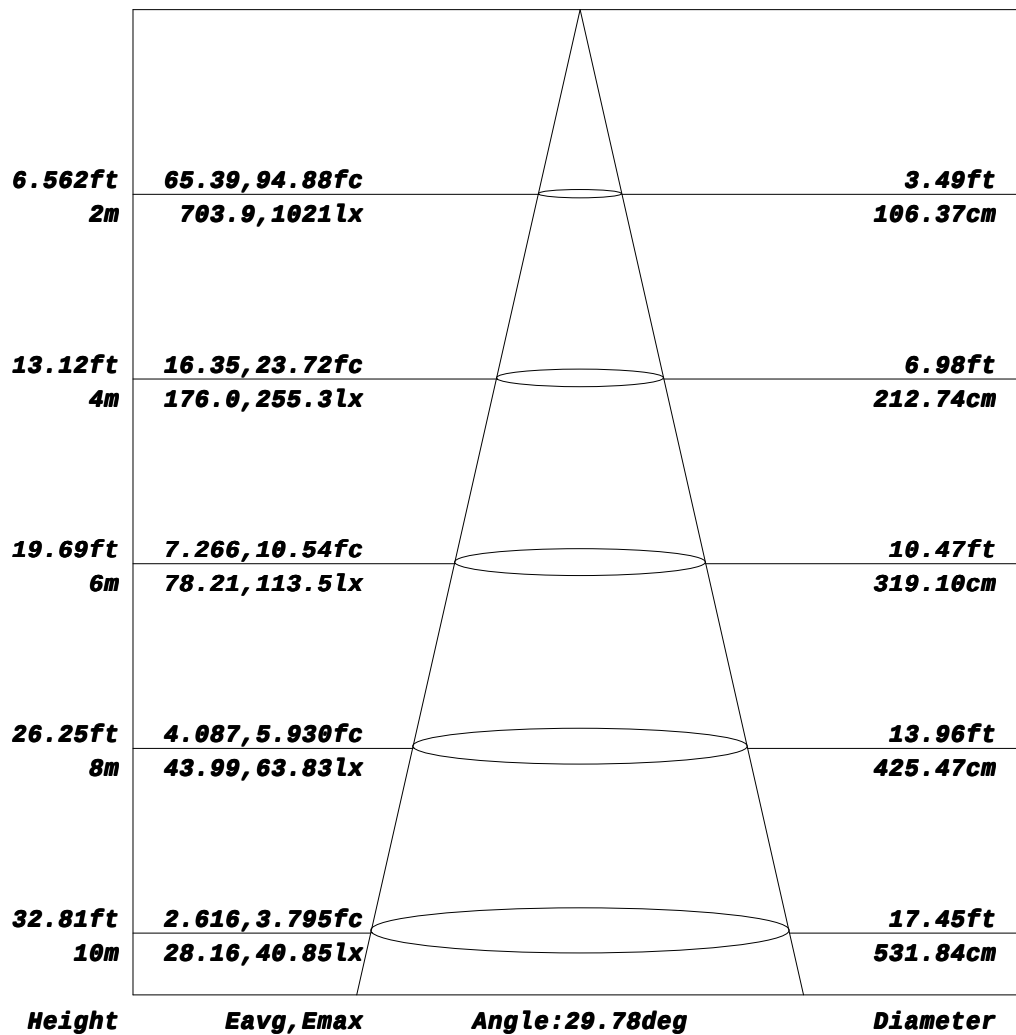
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-10

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE G0-2000B_V1 SYSTEM V2.0.267
Humidity: 65.0%
Test Distance: 8.000m [K=0.7063]
Remarks:

AAI Figure

Test:U:220.9V I:0.0980A P:21.00W PF:0.9620 Lamp Flux:1468.82x1 lm		
NAME: 20W 2700K	TYPE: LED	
MFR.:		

Flux out:635.1 lm



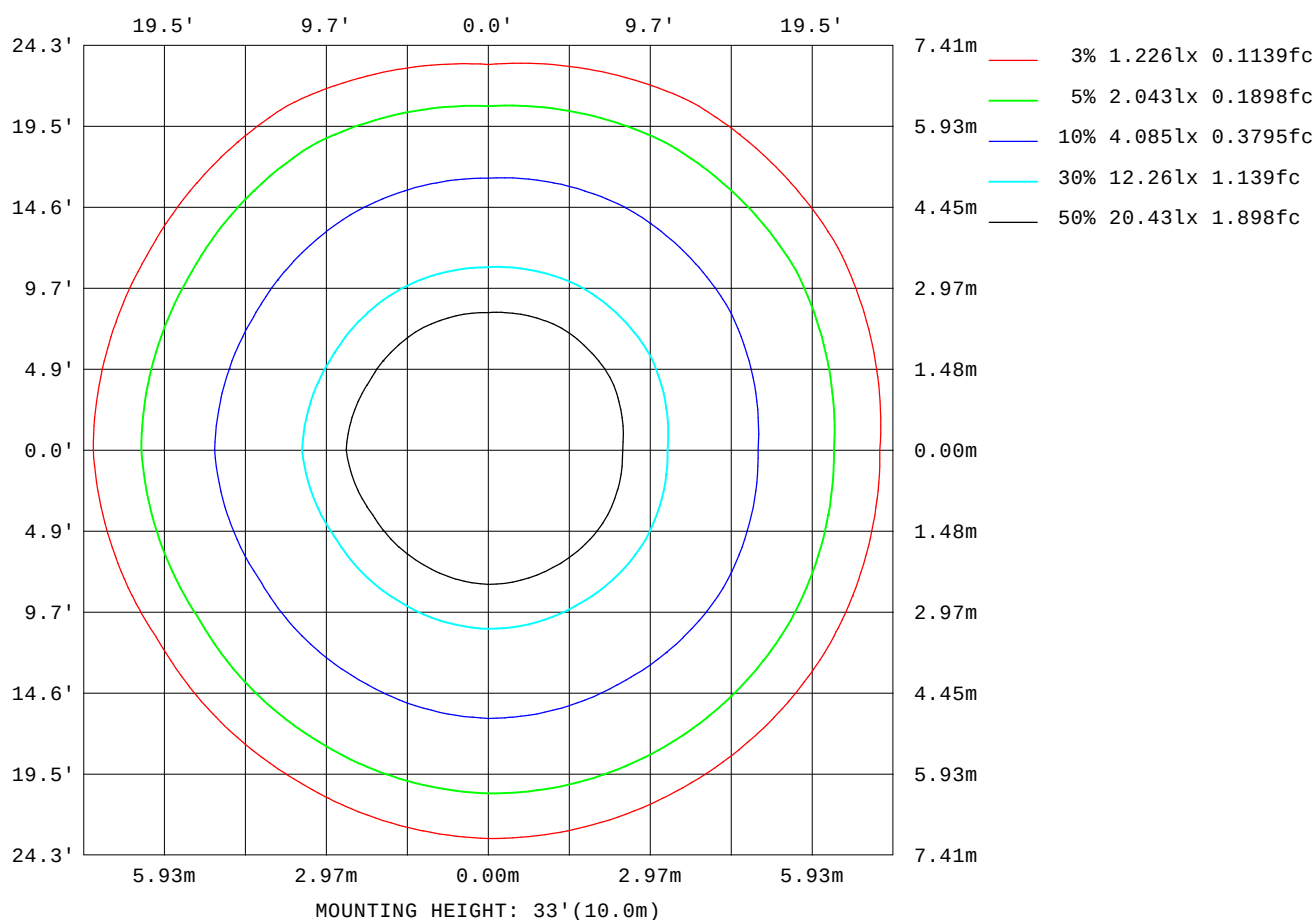
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-10

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE G0-2000B_V1 SYSTEM V2.0.267
Humidity: 65.0%
Test Distance: 8.000m [K=0.7063]
Remarks:

ISOLUX DIAGRAM

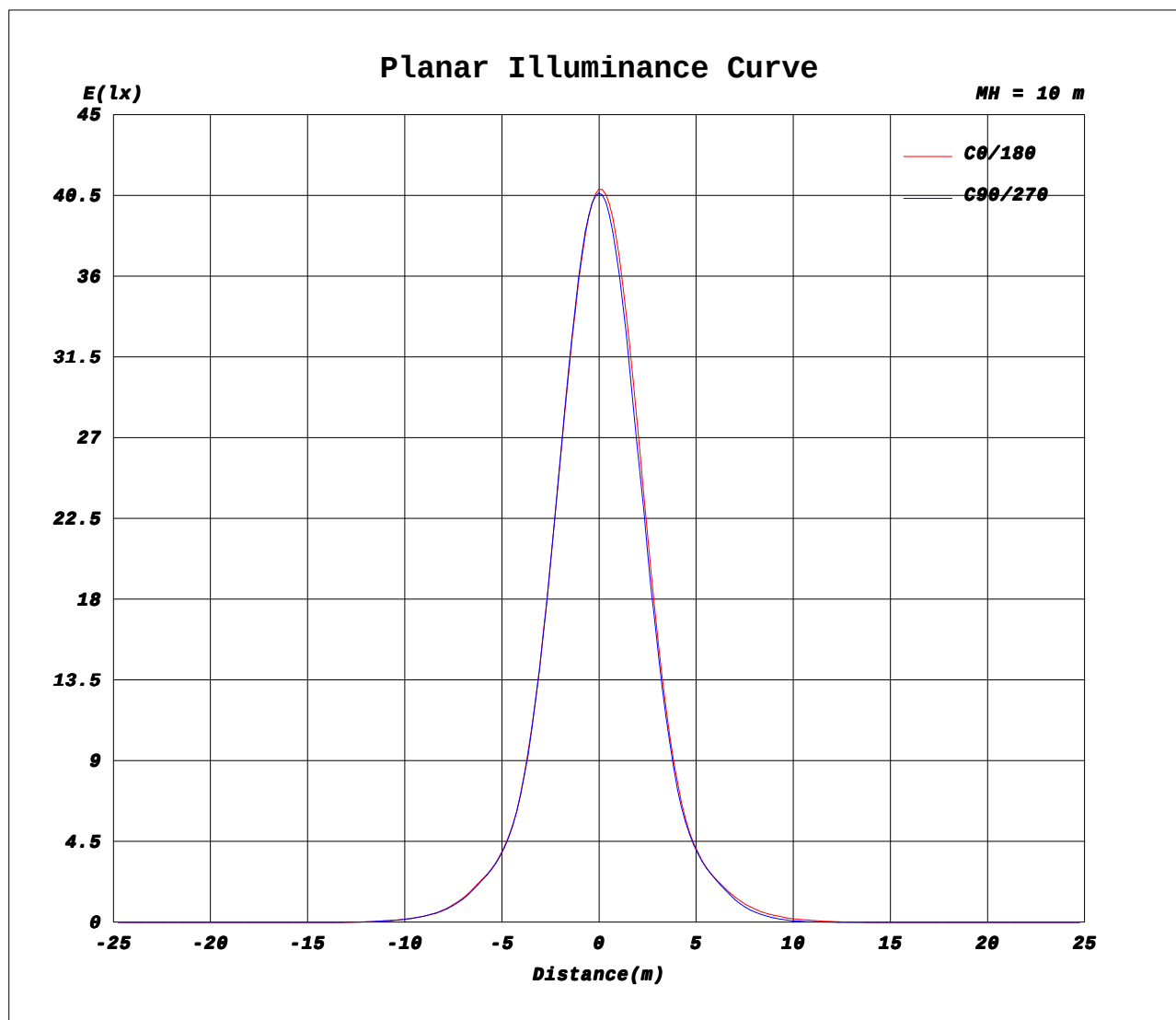
Test:U:220.9V I:0.0980A P:21.00W PF:0.9620 Lamp Flux:1468.82x1 lm		
NAME: 20W 2700K	TYPE: LED	
MFR.:		



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2017-03-10

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE G0-2000B_V1 SYSTEM V2.0.267
 Humidity: 65.0%
 Test Distance: 8.000m [K=0.7063]
 Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-10

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System: EVERFINE G0-2000B_V1 SYSTEM V2.0.267
Humidity: 65.0%
Test Distance: 8.000m [K=0.7063]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:220.9V I:0.0980A P:21.00W PF:0.9620 Lamp Flux:1468.82x1 lm																	
NAME: 20W 2700K									TYPE: LED								
MFR.:																	

Table--1

UNIT: cd

γ (DEG)	C (DEG)																			
	0	30	60	90	120	150	180	210	240	270	300	330								
0	4085	4081	4072	4065	4055	4046	4085	4081	4072	4065	4055	4046								
5	3753	3787	3769	3776	3736	3734	3870	3800	3810	3778	3823	3811								
10	2970	3016	2975	2988	2932	2945	3153	3025	3055	3008	3115	3093								
15	2000	2037	1994	1993	1934	1951	2171	2065	2097	2068	2177	2166								
20	1150	1162	1133	1128	1088	1086	1250	1194	1207	1207	1281	1290								
25	641	660	628	631	602	597	673	650	662	660	707	712								
30	414	422	411	407	388	378	417	413	428	415	440	445								
35	248	250	242	239	221	219	258	252	269	232	281	285								
40	120	122	118	116	107	108	130	127	134	96.6	140	143								
45	51.6	52.4	51.4	50.8	46.7	47.0	60.1	58.1	60.7	26.4	60.5	64.1								
50	14.8	16.1	15.3	15.9	14.2	14.8	22.5	20.9	22.1	7.24	21.2	22.3								
55	2.66	2.76	2.87	2.96	2.85	2.79	4.68	4.32	4.43	2.86	4.22	4.42								
60	1.47	1.40	1.44	1.49	1.51	1.47	2.38	2.41	2.40	2.08	2.14	2.41								
65	1.14	1.09	1.11	1.15	1.17	1.16	2.22	2.26	2.22	1.87	2.01	2.22								
70	0.90	0.85	0.87	0.89	0.93	0.92	2.27	2.29	2.27	1.79	2.01	2.21								
75	0.74	0.70	0.72	0.73	0.77	0.77	2.44	2.47	2.44	2.05	2.21	2.37								
80	0.65	0.63	0.64	0.63	0.67	0.68	2.68	2.70	2.63	2.31	2.48	2.58								
85	0.53	0.53	0.55	0.53	0.54	0.54	2.82	2.80	2.69	2.53	2.55	2.69								
90	0.49	0.50	0.49	0.49	0.49	0.51	2.86	2.84	2.82	2.80	2.78	2.77								
95	0.71	0.71	0.70	0.70	0.71	0.74	3.07	3.06	3.04	3.02	3.00	2.99								
100	1.06	1.04	1.05	1.03	1.06	1.10	3.29	3.28	3.26	3.23	3.21	3.20								
105	1.60	1.56	1.57	1.53	1.60	1.63	3.61	3.61	3.58	3.56	3.52	3.52								
110	2.37	2.31	2.32	2.29	2.37	2.41	4.13	4.16	4.12	4.10	4.04	4.04								
115	3.43	3.35	3.35	3.32	3.42	3.47	4.87	4.92	4.85	4.85	4.78	4.77								
120	4.79	4.69	4.70	4.66	4.78	4.83	5.81	5.85	5.79	5.76	5.68	5.66								
125	6.43	6.33	6.32	6.27	6.41	6.48	6.92	6.97	6.88	6.84	6.73	6.74								
130	8.35	8.20	8.22	8.11	8.28	8.36	8.23	8.30	8.16	8.13	7.99	8.02								
135	10.3	10.2	10.2	10.1	10.2	10.4	9.81	9.89	9.69	9.65	9.49	9.57								
140	12.4	12.3	12.2	12.1	12.3	12.4	11.7	11.8	11.6	11.4	11.3	11.4								
145	14.5	14.4	14.3	14.2	14.4	14.5	13.8	13.8	13.6	13.4	13.4	13.4								
150	16.6	16.5	16.3	16.2	16.4	16.6	16.1	16.1	15.8	15.4	15.5	15.6								
155	18.7	18.6	18.3	18.2	18.3	18.6	18.2	18.1	17.7	17.3	17.4	17.7								
160	20.5	20.4	20.2	20.0	20.1	20.3	20.1	19.8	19.3	18.9	18.9	19.3								
165	21.7	21.7	21.5	21.3	21.3	21.4	21.3	20.9	20.3	19.9	19.8	20.2								
170	22.2	22.3	21.9	21.8	21.7	21.7	21.9	21.2	20.7	20.2	20.1	20.4								
175	22.6	22.5	22.1	22.0	21.7	21.8	22.2	21.5	21.0	20.5	20.4	20.5								
180	22.9	22.6	22.0	21.7	21.4	21.6	23.0	22.5	22.0	21.6	21.5	21.6								

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-10

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.267
Humidity: 65.0%
Test Distance: 8.000m [K=0.7063]
Remarks: