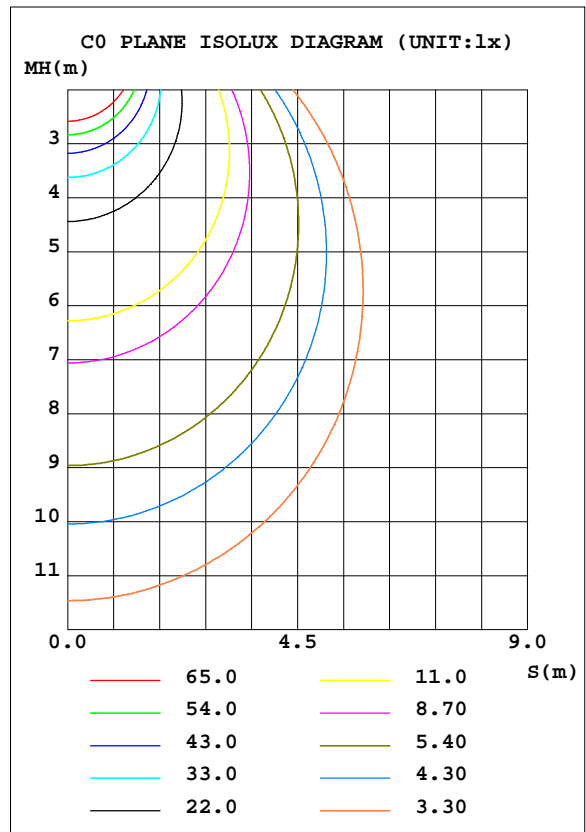
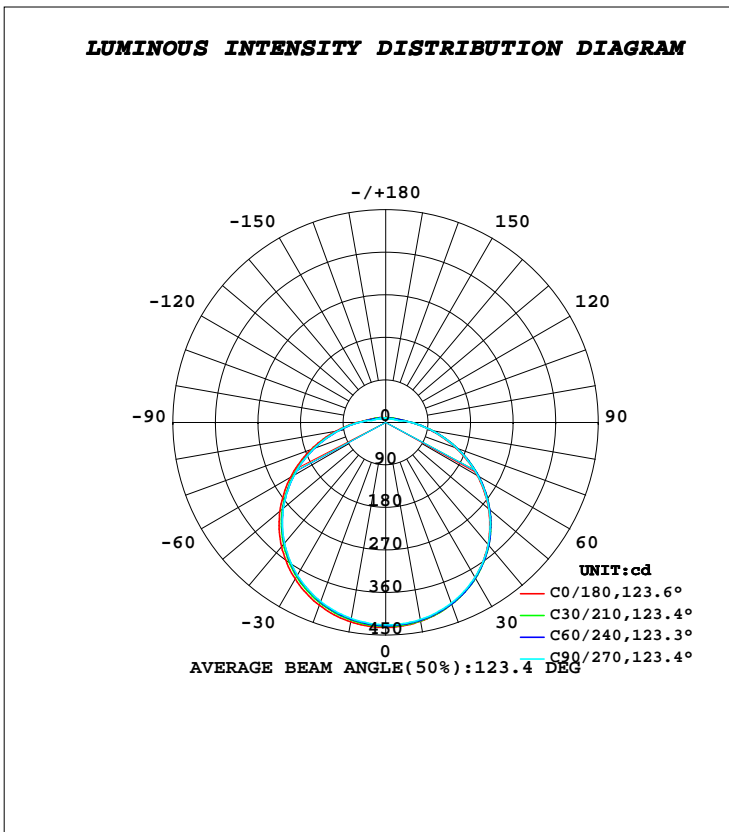


LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:220.0V I:0.0830A P:17.30W PF:0.9510 Lamp Flux:1582.45x1 lm		
NAME: M320 18W 000 4000K	TYPE:LED	
MFR.:		

DATA OF LAMP		PHOTOMETRIC DATA			
MODEL	M320 18W 000 4000K	Imax(cd)	433.6	S/MH(C0/180)	1.30
NOMINAL POWER(W)	17.3	LOR(%)	100.0	S/MH(C90/270)	1.31
RATED VOLTAGE(V)	220	TOTAL FLUX(lm)	1582.4	η UP, DN(C0-180)	4.1,45.3
NOMINAL FLUX(lm)	1582.45	CIE CLASS	DIRECT	η UP, DN(C180-360)	4.5,46.1
LAMPS INSIDE	1	η up(%)	8.6	CIBSE SHR NOM	1.50
TEST VOLTAGE(V)	220.1	η down(%)	91.4	CIBSE SHR MAX	1.50



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-01-11

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:

ZONAL FLUX DIAGRAM

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	427.1	425.7	423.3	419.8	428.3	423.6	420.9	420.9	0- 10	40.69	40.69	2.57,2.57
20	408.8	408.9	406.8	401.9	411.3	405.0	402.8	404.2	10- 20	117.5	158.2	10,10
30	378.8	380.1	378.0	372.0	382.8	375.8	373.5	376.6	20- 30	181.2	339.4	21.4,21.4
40	337.0	339.5	337.5	330.7	342.9	335.0	333.1	337.5	30- 40	224.1	563.4	35.6,35.6
50	284.1	287.5	285.8	278.5	292.9	284.7	282.8	288.4	40- 50	240.8	804.2	50.8,50.8
60	223.4	226.8	225.2	218.1	232.6	225.0	223.8	229.7	50- 60	229.1	1033	65.3,65.3
70	158.3	161.7	160.1	153.8	168.4	161.8	161.3	167.0	60- 70	191.6	1225	77.4,77.4
80	97.25	99.89	99.32	93.99	106.9	101.4	102.0	106.0	70- 80	137.5	1362	86.1,86.1
90	54.47	55.40	54.43	52.26	60.92	57.47	57.01	60.14	80- 90	83.75	1446	91.4,91.4
100	33.09	33.02	27.20	31.58	36.37	34.58	28.98	35.68	90-100	47.15	1493	94.4,94.4
110	23.43	22.61	19.48	21.68	25.65	23.90	21.06	24.72	100-110	29.00	1522	96.2,96.2
120	18.03	17.29	15.27	16.70	19.77	18.61	16.88	18.96	110-120	20.00	1542	97.5,97.5
130	14.50	14.02	12.57	13.45	16.01	15.07	14.02	15.45	120-130	14.39	1557	98.4,98.4
140	12.11	11.74	10.65	11.24	13.06	12.47	11.94	12.87	130-140	10.22	1567	99,99
150	10.45	10.21	9.645	9.797	11.01	10.79	10.61	11.07	140-150	7.036	1574	99.5,99.5
160	9.962	9.607	9.518	9.506	10.18	10.15	10.14	10.26	150-160	4.681	1579	99.8,99.8
170	10.16	10.02	9.934	9.965	10.26	10.22	10.22	10.30	160-170	2.829	1581	99.9,99.9
180	10.26	10.13	10.15	10.18	10.31	10.13	10.12	10.18	170-180	0.9699	1582	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

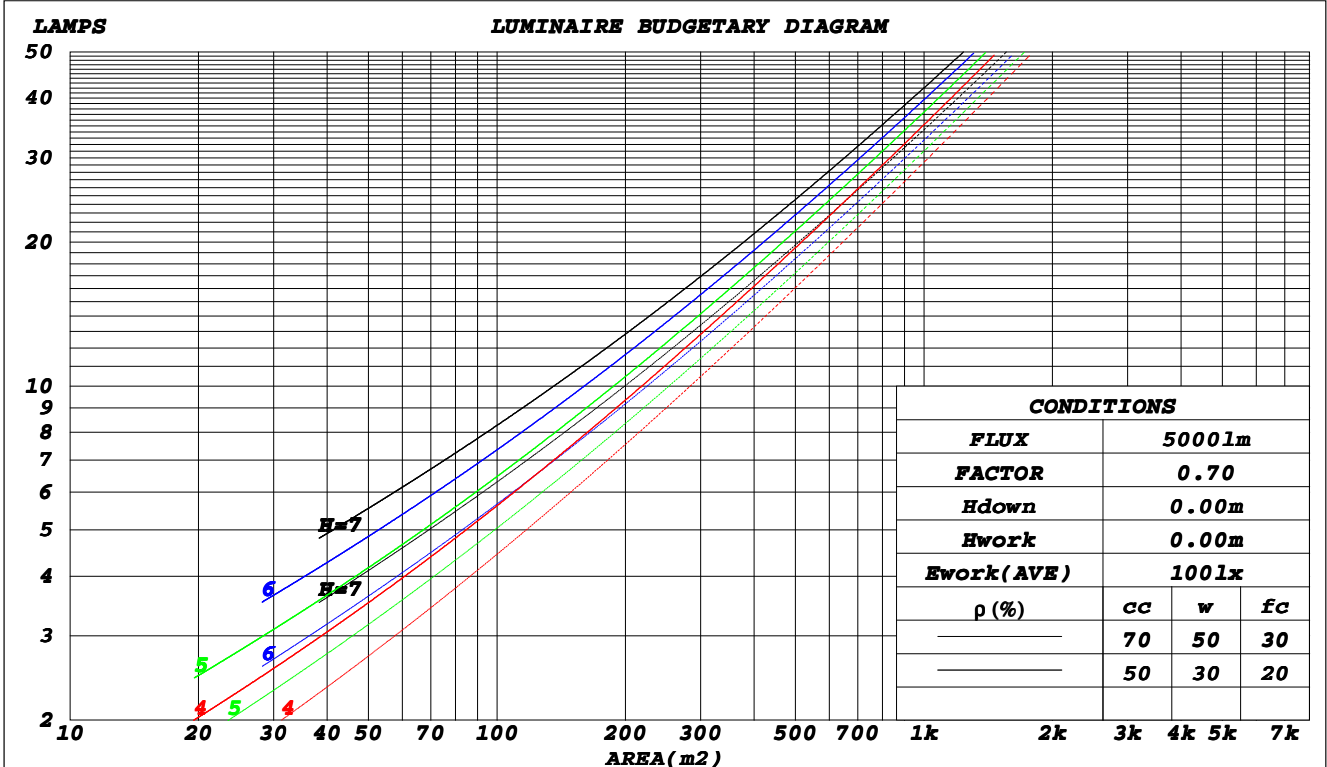
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-01-11

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:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:220.0V I:0.0830A P:17.30W PF:0.9510 Lamp Flux:1582.45x1 lm		
NAME: M320 18W 000 4000K	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	1.17	1.17	1.17	1.13	1.13	1.13	1.06	1.06	1.06	.00	.00	.00	.94	.94	.94	.91
1.0	.99	.94	.90	.96	.92	.88	.90	.87	.83	.85	.82	.79	.80	.77	.75	.73
2.0	.86	.78	.72	.83	.76	.70	.78	.72	.67	.73	.69	.64	.69	.65	.62	.59
3.0	.75	.66	.59	.72	.64	.58	.68	.61	.56	.64	.58	.53	.60	.56	.51	.49
4.0	.66	.56	.49	.64	.55	.48	.60	.53	.47	.57	.50	.45	.53	.48	.44	.41
5.0	.58	.49	.42	.57	.48	.41	.54	.46	.40	.51	.44	.39	.48	.42	.38	.35
6.0	.52	.43	.36	.51	.42	.36	.48	.41	.35	.46	.39	.34	.43	.37	.33	.31
7.0	.47	.38	.32	.46	.38	.32	.44	.36	.31	.42	.35	.30	.39	.34	.29	.27
8.0	.43	.34	.28	.42	.34	.28	.40	.33	.27	.38	.31	.27	.36	.30	.26	.24
9.0	.39	.31	.25	.38	.30	.25	.37	.29	.24	.35	.29	.24	.33	.28	.23	.21
10.0	.36	.28	.23	.35	.28	.23	.34	.27	.22	.32	.26	.22	.31	.25	.21	.19



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2018-01-11

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:220.0V I:0.0830A P:17.30W PF:0.9510 Lamp Flux:1582.45x1 lm		
NAME: M320 18W 000 4000K	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	.357	.203	.064	.347	.198	.063	.329	.189	.060	.312	.180	.058	.297	.172	.055	
2.0	.319	.175	.054	.310	.171	.053	.294	.163	.051	.278	.156	.049	.264	.150	.047	
3.0	.288	.153	.046	.280	.150	.045	.265	.144	.044	.251	.138	.042	.239	.132	.041	
4.0	.261	.136	.040	.254	.133	.039	.241	.128	.038	.229	.123	.037	.217	.118	.036	
5.0	.239	.122	.035	.233	.120	.035	.221	.115	.034	.210	.111	.033	.199	.107	.032	
6.0	.220	.110	.032	.214	.108	.031	.204	.104	.030	.193	.101	.030	.184	.097	.029	
7.0	.204	.101	.029	.199	.099	.028	.189	.095	.027	.180	.092	.027	.171	.089	.026	
8.0	.189	.093	.026	.185	.091	.026	.176	.088	.025	.167	.085	.024	.160	.082	.024	
9.0	.177	.086	.024	.173	.084	.024	.164	.081	.023	.157	.079	.022	.150	.076	.022	
10.0	.166	.080	.022	.162	.078	.022	.154	.076	.021	.147	.073	.021	.141	.071	.020	

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																
1.0	.256	.256	.256	.219	.219	.219	.149	.149	.149	.086	.086	.086	.027	.027	.027	
2.0	.242	.198	.161	.208	.171	.139	.142	.118	.097	.082	.069	.057	.026	.022	.019	
3.0	.235	.181	.139	.201	.156	.120	.138	.109	.084	.080	.063	.050	.026	.021	.016	
4.0	.227	.169	.124	.195	.146	.107	.134	.101	.076	.078	.059	.045	.025	.019	.015	
5.0	.220	.158	.113	.189	.137	.099	.130	.096	.070	.075	.056	.041	.024	.018	.014	
6.0	.212	.150	.106	.182	.130	.092	.126	.091	.065	.073	.054	.039	.024	.018	.013	
7.0	.205	.144	.100	.176	.124	.087	.122	.087	.062	.071	.051	.037	.023	.017	.012	
8.0	.198	.138	.096	.171	.120	.084	.118	.084	.060	.069	.050	.035	.022	.016	.012	
9.0	.192	.133	.093	.166	.115	.081	.115	.081	.058	.067	.048	.034	.022	.016	.011	
10.0	.186	.129	.090	.161	.112	.079	.111	.079	.056	.065	.047	.033	.021	.015	.011	

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-01-11

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:220.0V I:0.0830A P:17.30W PF:0.9510 Lamp Flux:1582.45x1 lm		
NAME: M320 18W 000 4000K	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	18.0	19.4	18.3	19.8	20.2	18.0	19.4	18.4	19.8	20.2
3H	19.8	21.2	20.2	21.6	22.0	19.8	21.2	20.3	21.6	22.0
4H	20.7	22.0	21.1	22.4	22.8	20.7	22.0	21.2	22.4	22.9
6H	21.6	22.8	22.0	23.2	23.7	21.6	22.8	22.1	23.3	23.7
8H	22.0	23.2	22.5	23.6	24.1	22.1	23.2	22.5	23.7	24.1
12H	22.5	23.6	23.0	24.1	24.6	22.5	23.7	23.0	24.1	24.6
4H 2H	18.6	19.9	19.1	20.3	20.8	18.7	19.9	19.1	20.4	20.8
3H	20.7	21.8	21.2	22.3	22.8	20.7	21.9	21.2	22.3	22.8
4H	21.8	22.8	22.3	23.3	23.8	21.8	22.8	22.3	23.3	23.8
6H	22.8	23.7	23.3	24.2	24.8	22.8	23.8	23.4	24.3	24.8
8H	23.3	24.2	23.9	24.7	25.3	23.4	24.2	23.9	24.8	25.3
12H	23.9	24.7	24.5	25.2	25.8	24.0	24.8	24.5	25.3	25.9
8H 4H	22.2	23.0	22.7	23.6	24.1	22.2	23.1	22.7	23.6	24.2
6H	23.5	24.2	24.0	24.7	25.3	23.5	24.2	24.1	24.8	25.4
8H	24.1	24.8	24.7	25.4	26.0	24.2	24.8	24.8	25.4	26.0
12H	24.9	25.5	25.5	26.1	26.8	25.0	25.5	25.6	26.1	26.8
12H 4H	22.2	23.0	22.8	23.6	24.2	22.3	23.1	22.8	23.6	24.2
6H	23.6	24.3	24.2	24.8	25.5	23.6	24.3	24.2	24.9	25.5
8H	24.4	25.0	25.0	25.6	26.2	24.4	25.0	25.0	25.6	26.3
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.1					+ 0.1 / - 0.1				
1.5H	+ 0.2 / - 0.3					+ 0.2 / - 0.3				
2.0H	+ 0.2 / - 0.4					+ 0.2 / - 0.4				

CIE Pub.117 Corrected 1582 lm Total Lamp Luminous Flux.(8log(F/F0) = 1.6)

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-01-11

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:220.0V I:0.0830A P:17.30W PF:0.9510 Lamp Flux:1582.45x1 lm		
NAME: M320 18W 000 4000K	TYPE:LED	
MFR.:		

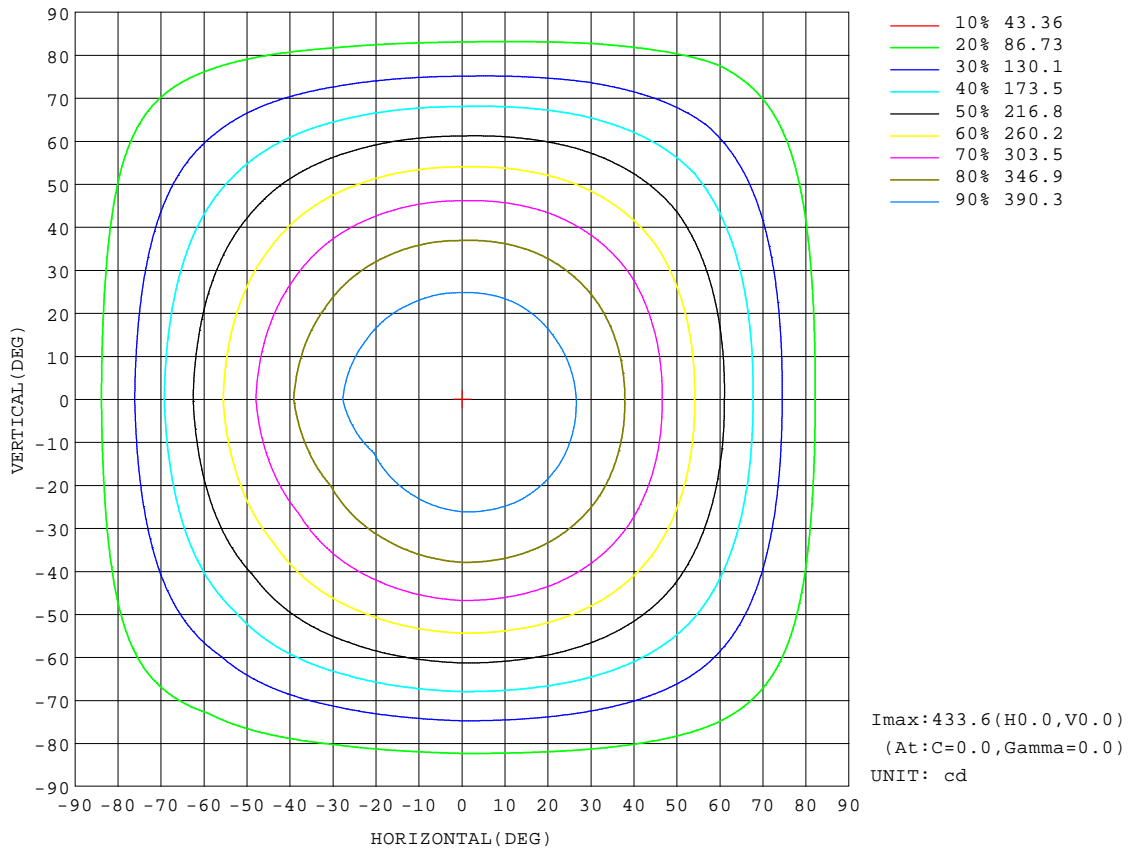
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
k = 0.60	52	40	33	51	40	33	50	39	32	26
0.80	62	49	41	60	49	41	58	48	41	33
1.00	70	58	50	68	57	49	65	58	48	40
1.25	77	65	57	75	64	56	71	62	55	47
1.50	82	71	63	80	69	62	76	67	60	51
2.00	89	79	71	87	77	70	82	74	68	58
2.50	93	84	77	91	82	76	85	79	73	63
3.00	97	89	82	94	86	80	89	82	77	66
4.00	101	94	88	98	92	87	92	87	83	71
5.00	104	98	93	101	95	91	95	90	87	74
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:2018-01-11

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:

ISOCANDELA DIAGRAM

Test:U:220.0V I:0.0830A P:17.30W PF:0.9510 Lamp Flux:1582.45x1 lm		
NAME: M320 18W 000 4000K	TYPE:LED	
MFR.:		



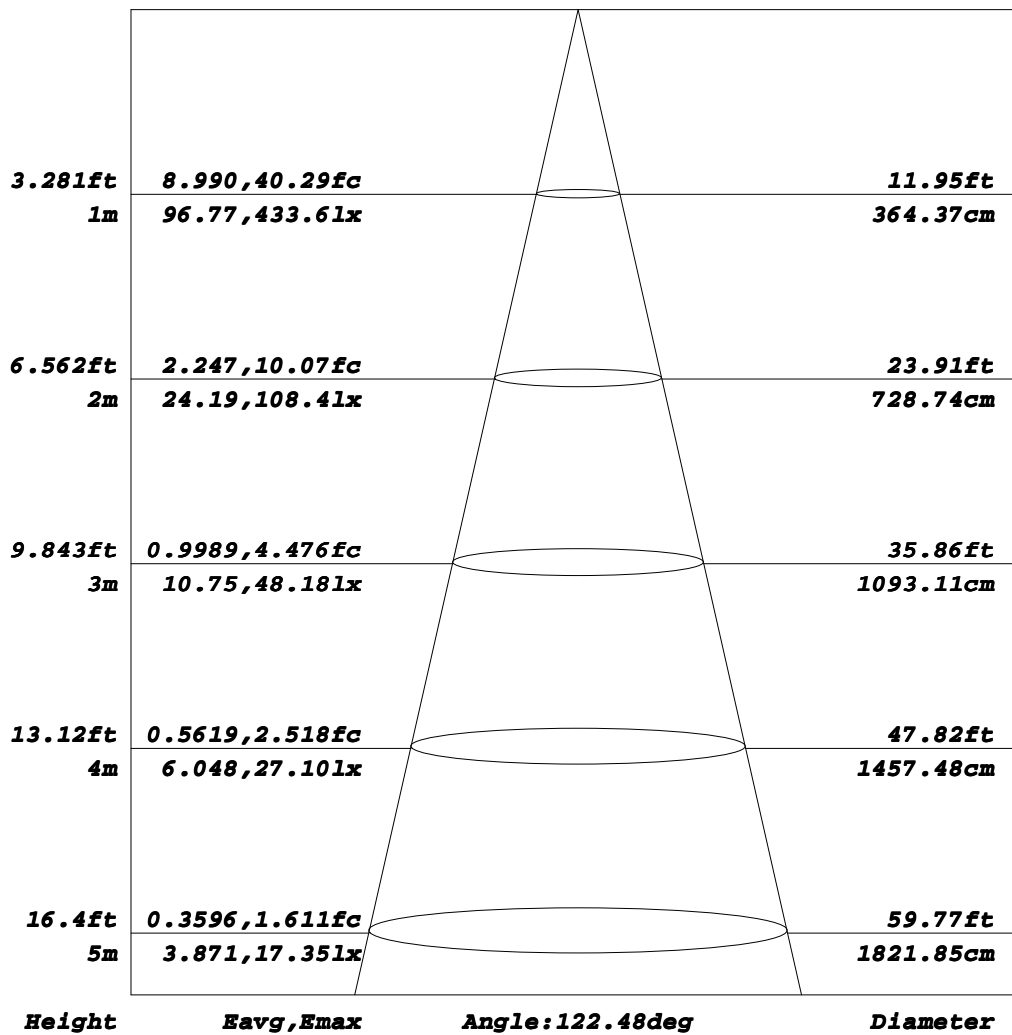
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-01-11

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:

AAI Figure

Test:U:220.0V I:0.0830A P:17.30W PF:0.9510 Lamp Flux:1582.45x1 lm		
NAME: M320 18W 000 4000K	TYPE:LED	
MFR.:		

Flux out:1075 lm



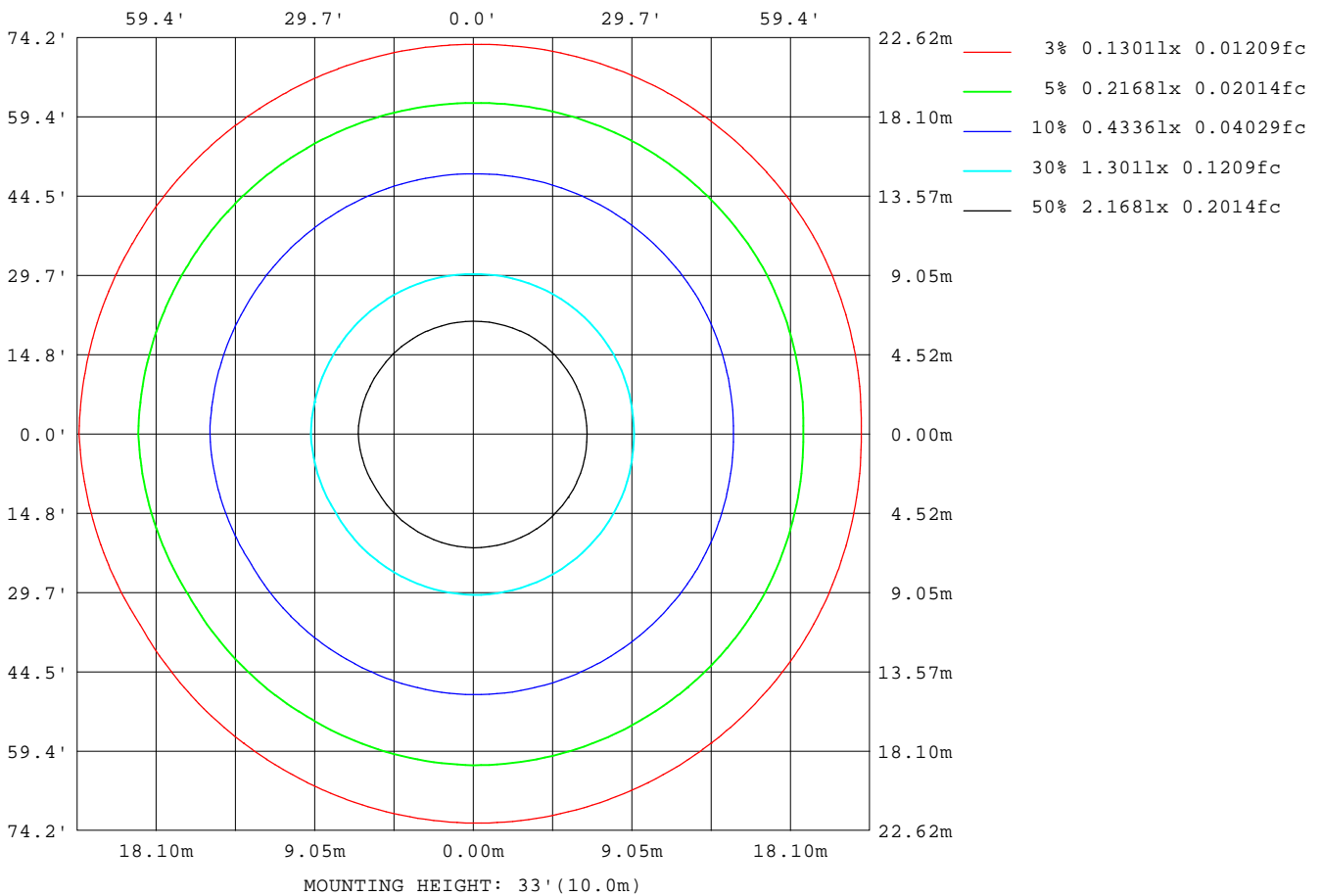
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2018-01-11

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:

ISOLUX DIAGRAM

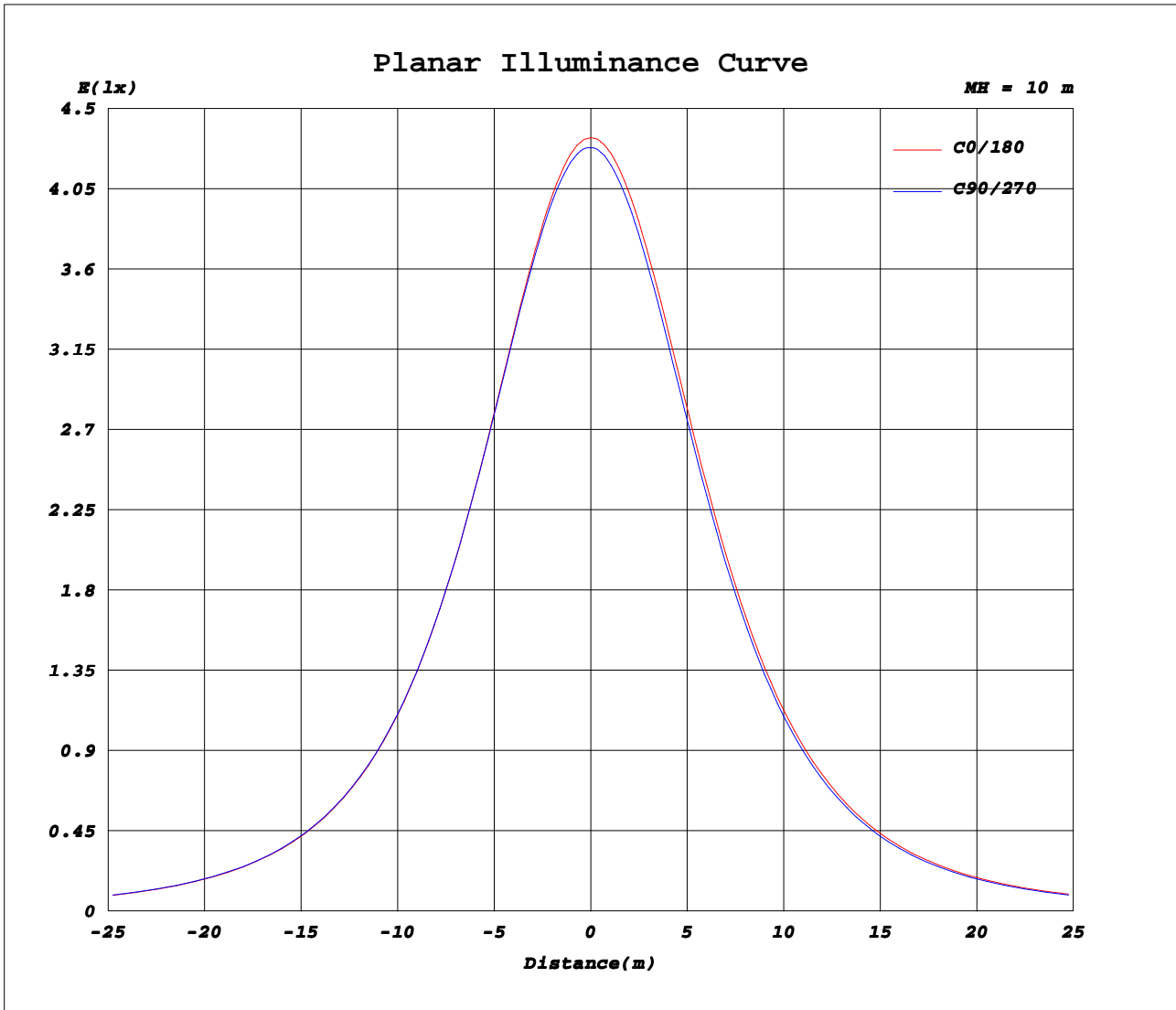
Test:U:220.0V I:0.0830A P:17.30W PF:0.9510 Lamp Flux:1582.45x1 lm		
NAME: M320 18W 000 4000K	TYPE:LED	
MFR.:		



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-01-11

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:

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-01-11

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:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:220.0V I:0.0830A P:17.30W PF:0.9510 Lamp Flux:1582.45x1 lm		
NAME: M320 18W 000 4000K	TYPE:LED	
MFR.:		

Table--1

UNIT: cd

C(DEG) γ (DEG)	0	30	60	90	120	150	180	210	240	270	300	330							
0	434	431	430	428	427	426	434	431	430	428	427	426							
5	432	430	429	427	425	424	432	430	428	426	426	425							
10	427	426	425	423	421	419	428	425	423	421	421	420							
15	419	419	418	416	413	411	421	417	415	413	414	414							
20	409	409	408	407	403	401	411	406	404	403	404	404							
25	395	396	396	394	390	387	399	393	390	390	391	392							
30	379	381	380	378	373	371	383	377	374	374	376	377							
35	359	362	361	359	354	351	364	358	356	355	358	359							
40	337	340	339	338	332	329	343	336	334	333	337	338							
45	312	315	315	313	307	304	319	312	310	309	313	315							
50	284	288	287	286	280	277	293	286	284	283	288	289							
55	255	258	258	256	251	248	263	257	254	254	259	261							
60	223	227	227	225	219	217	233	226	224	224	229	230							
65	191	194	194	193	187	185	201	195	193	193	198	200							
70	158	162	162	160	155	153	168	163	161	161	166	168							
75	127	130	129	129	123	122	137	131	130	130	135	136							
80	97.2	100	99.5	99.3	94.3	93.7	107	102	101	102	105	107							
85	73.3	75.1	74.8	73.9	70.9	70.1	81.3	77.4	76.1	77.0	80.3	81.0							
90	54.5	55.6	55.2	54.4	52.5	52.1	60.9	58.0	56.9	57.0	59.9	60.4							
95	41.4	42.2	41.5	40.1	39.7	39.8	46.1	44.0	43.2	43.3	45.3	45.6							
100	33.1	33.4	32.7	27.2	31.3	31.8	36.4	34.9	34.3	29.0	35.6	35.8							
105	27.5	27.6	26.2	22.8	25.1	26.5	30.0	29.0	27.3	24.5	28.9	29.6							
110	23.4	23.4	21.8	19.5	20.8	22.6	25.7	24.9	22.9	21.1	24.2	25.3							
115	20.3	20.4	18.7	17.1	18.1	19.8	22.3	21.8	20.0	18.7	20.8	21.9							
120	18.0	18.0	16.6	15.3	15.9	17.5	19.8	19.4	17.8	16.9	18.5	19.4							
125	16.1	16.1	14.9	13.8	14.2	15.6	17.8	17.4	16.0	15.3	16.7	17.5							
130	14.5	14.5	13.5	12.6	12.8	14.1	16.0	15.6	14.5	14.0	15.1	15.8							
135	13.2	13.2	12.4	11.5	11.7	12.7	14.5	14.1	13.3	12.9	13.8	14.4							
140	12.1	12.1	11.4	10.6	10.9	11.6	13.1	12.8	12.2	11.9	12.6	13.1							
145	11.2	11.2	10.6	10.0	9.98	10.7	11.9	11.7	11.3	11.2	11.7	12.0							
150	10.5	10.5	9.94	9.64	9.52	10.1	11.0	10.9	10.7	10.6	11.0	11.2							
155	10.0	10.0	9.63	9.49	9.34	9.68	10.4	10.4	10.3	10.3	10.5	10.6							
160	9.96	9.64	9.58	9.52	9.42	9.60	10.2	10.2	10.1	10.1	10.2	10.3							
165	10.2	9.77	9.71	9.69	9.66	9.80	10.3	10.1	10.2	10.1	10.2	10.2							
170	10.2	10.1	9.98	9.93	9.95	9.98	10.3	10.2	10.2	10.2	10.3	10.3							
175	10.3	10.2	10.1	10.0	10.1	10.1	10.2	10.1	10.1	10.2	10.3	10.3							
180	10.3	10.2	10.1	10.1	10.2	10.2	10.3	10.2	10.1	10.1	10.2	10.2							

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-01-11

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: