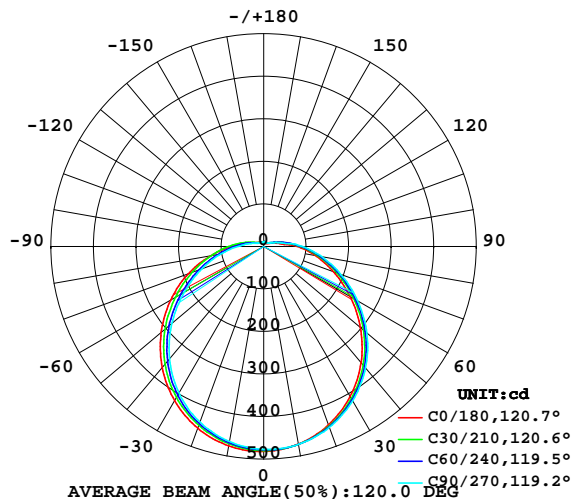


LUMINAIRE PHOTOMETRIC TEST REPORT

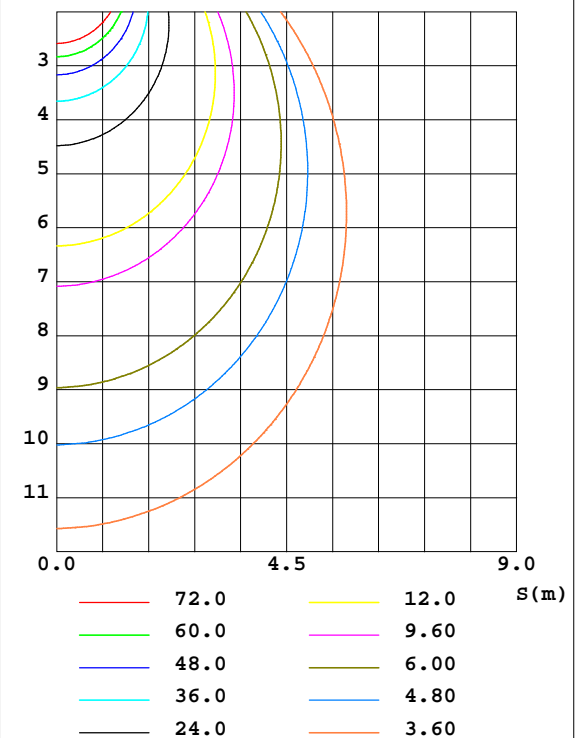
Test:U:220.3V I:0.0810A P:17.00W PF:0.9490 Lamp Flux:1758.2x1 lm		
NAME: D290 18W 000 40K	TYPE:LED	
MFR.:		

DATA OF LAMP		PHOTOMETRIC DATA Eff: 103.42 lm/W			
MODEL	D290 18W 000 40K	Imax(cd)	482.1	S/MH(C0/180)	1.26
NOMINAL POWER(W)	17	LOR(%)	100.0	S/MH(C90/270)	1.31
RATED VOLTAGE(V)	220	TOTAL FLUX(lm)	1758.2	η UP,DN(C0-180)	5.0,46.5
NOMINAL FLUX(lm)	1758.2	CIE CLASS	DIRECT	η UP,DN(C180-360)	4.6,43.9
LAMPS INSIDE	1	η up(%)	9.6	CIBSE SHR NOM	1.25
TEST VOLTAGE(V)	220.3	η down(%)	90.4	CIBSE SHR MAX	1.35

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:2018-05-18

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	471.8	472.4	472.3	470.1	476.0	469.6	465.3	465.0	0- 10	45.24	45.24	2.57,2.57
20	446.2	450.2	452.3	449.1	454.2	445.2	439.1	439.8	10- 20	129.9	175.2	9.96,9.96
30	407.1	414.2	418.7	414.8	419.0	407.0	398.4	400.8	20- 30	198.2	373.4	21.2,21.2
40	356.5	366.5	372.7	368.2	371.3	356.2	344.5	349.7	30- 40	241.9	615.3	35,35
50	297.1	309.3	317.0	312.4	315.2	297.1	281.9	290.1	40- 50	256.4	871.7	49.6,49.6
60	234.4	247.0	254.9	250.9	252.5	232.4	216.2	226.1	50- 60	242.4	1114	63.4,63.4
70	175.0	186.4	193.5	190.4	189.2	171.2	155.0	166.1	60- 70	206.5	1321	75.1,75.1
80	123.4	132.1	138.5	135.2	126.6	116.8	101.7	114.3	70- 80	159.0	1480	84.2,84.2
90	79.30	86.90	91.16	89.28	74.32	76.42	60.86	74.73	80- 90	110.0	1590	90.4,90.4
100	40.16	52.90	47.32	55.11	44.63	47.63	37.93	46.07	90-100	68.84	1658	94.3,94.3
110	24.56	29.62	28.54	30.86	28.26	28.25	22.88	26.07	100-110	39.34	1698	96.6,96.6
120	16.40	18.02	18.14	18.04	18.84	17.84	16.53	16.47	110-120	21.75	1719	97.8,97.8
130	12.38	13.59	13.36	13.62	14.64	13.85	13.02	13.16	120-130	13.77	1733	98.6,98.6
140	10.44	11.11	10.88	11.28	12.01	11.55	10.87	10.95	130-140	9.447	1743	99.1,99.1
150	9.922	10.10	9.949	10.27	10.95	10.57	10.18	10.24	140-150	6.685	1749	99.5,99.5
160	10.47	10.20	10.15	10.09	10.69	10.52	10.53	10.41	150-160	4.744	1754	99.8,99.8
170	11.11	10.88	10.87	10.77	11.18	11.01	10.99	10.86	160-170	3.012	1757	99.9,99.9
180	11.46	11.35	11.36	11.19	11.52	11.34	11.34	11.19	170-180	1.058	1758	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

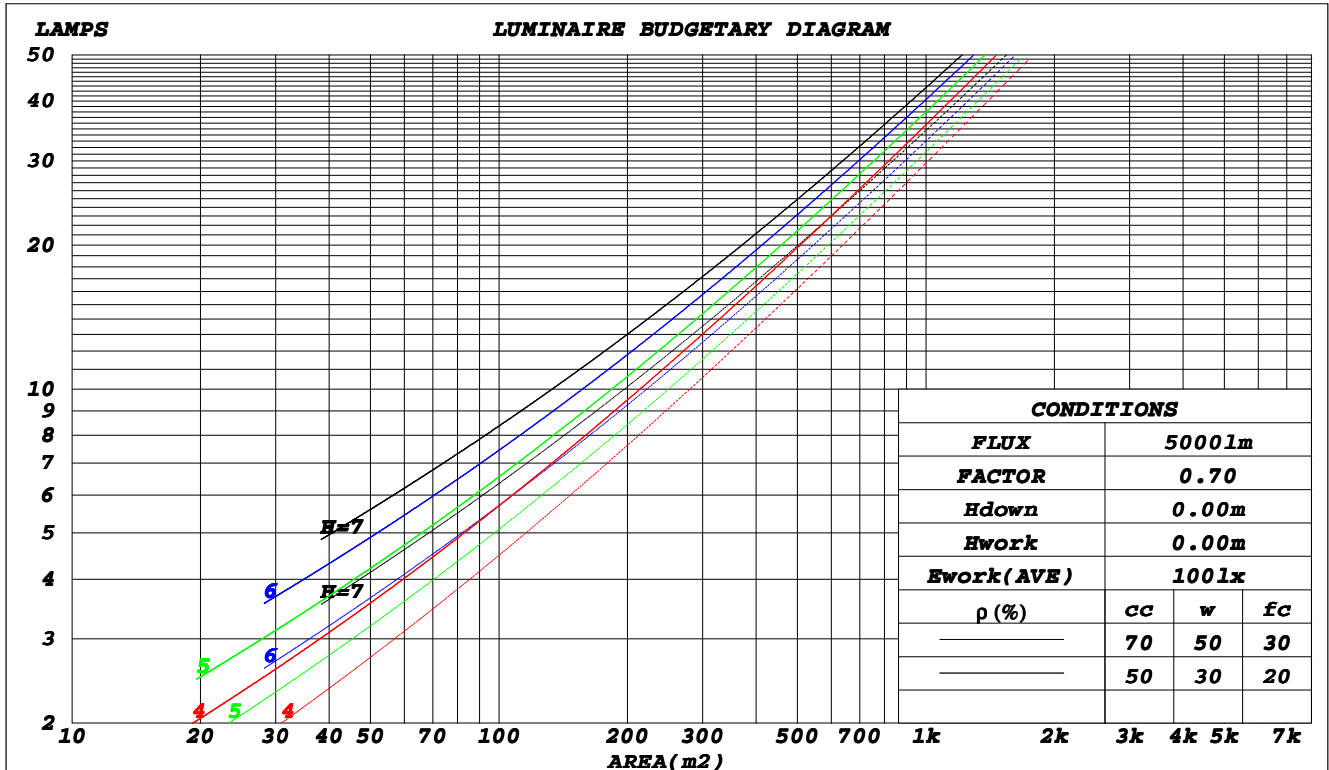
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-05-18

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:220.3V I:0.0810A P:17.00W PF:0.9490 Lamp Flux:1758.2x1 lm		
NAME: D290 18W 000 40K	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	.99	.99	.99	.93	.93	.93	.90
1.0	.99	.93	.89	.95	.91	.86	.89	.85	.82	.84	.81	.78	.78	.76	.74	.71
2.0	.85	.77	.71	.82	.75	.69	.77	.71	.66	.72	.67	.63	.68	.64	.60	.57
3.0	.74	.65	.58	.72	.63	.57	.67	.60	.55	.63	.57	.52	.59	.54	.50	.48
4.0	.65	.56	.49	.63	.54	.48	.59	.52	.46	.56	.49	.44	.53	.47	.43	.40
5.0	.58	.48	.42	.56	.47	.41	.53	.45	.39	.50	.43	.38	.47	.41	.37	.34
6.0	.52	.43	.36	.50	.42	.35	.48	.40	.34	.45	.38	.33	.43	.37	.32	.30
7.0	.47	.38	.32	.46	.37	.31	.43	.36	.30	.41	.34	.29	.39	.33	.29	.26
8.0	.43	.34	.28	.42	.33	.28	.40	.32	.27	.38	.31	.26	.36	.30	.25	.23
9.0	.39	.31	.25	.38	.30	.25	.36	.29	.24	.35	.28	.24	.33	.27	.23	.21
10.0	.36	.28	.23	.35	.28	.22	.34	.27	.22	.32	.26	.21	.31	.25	.21	.19



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2018-05-18

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:220.3V I:0.0810A P:17.00W PF:0.9490 Lamp Flux:1758.2x1 lm											
NAME: D290 18W 000 40K						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	.368	.209	.066	.358	.204	.065	.339	.194	.062	.321	.185	.059	.305	.177	.057	
2.0	.324	.178	.054	.315	.173	.053	.298	.166	.051	.282	.158	.050	.268	.151	.048	
3.0	.290	.155	.046	.282	.151	.046	.267	.145	.044	.253	.139	.042	.240	.133	.041	
4.0	.263	.137	.040	.256	.134	.040	.242	.128	.038	.229	.123	.037	.217	.118	.036	
5.0	.240	.122	.035	.233	.120	.035	.221	.115	.034	.209	.111	.033	.199	.106	.032	
6.0	.221	.111	.032	.215	.108	.031	.203	.104	.030	.193	.100	.029	.183	.096	.029	
7.0	.204	.101	.029	.199	.099	.028	.188	.095	.027	.179	.092	.027	.170	.088	.026	
8.0	.189	.093	.026	.185	.091	.026	.175	.088	.025	.167	.084	.024	.158	.081	.024	
9.0	.177	.086	.024	.172	.084	.024	.164	.081	.023	.156	.078	.022	.148	.075	.022	
10.0	.166	.079	.022	.162	.078	.022	.154	.075	.021	.147	.073	.021	.140	.070	.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	.264	.264	.264	.225	.225	.225	.154	.154	.154	.088	.088	.088	.028	.028	.028	
1.0	.258	.229	.203	.221	.197	.175	.151	.135	.121	.087	.078	.070	.028	.025	.023	
2.0	.251	.206	.168	.215	.177	.145	.147	.123	.101	.085	.071	.059	.027	.023	.019	
3.0	.243	.189	.146	.208	.163	.127	.143	.113	.089	.083	.066	.052	.027	.021	.017	
4.0	.235	.176	.131	.202	.152	.114	.139	.106	.080	.080	.062	.047	.026	.020	.016	
5.0	.227	.166	.121	.195	.144	.105	.135	.100	.074	.078	.059	.044	.025	.019	.015	
6.0	.220	.158	.114	.189	.137	.099	.130	.096	.070	.076	.056	.042	.024	.018	.014	
7.0	.213	.151	.108	.183	.131	.094	.127	.092	.067	.074	.054	.040	.024	.018	.013	
8.0	.206	.146	.104	.178	.126	.091	.123	.089	.064	.071	.052	.038	.023	.017	.013	
9.0	.200	.141	.101	.172	.122	.088	.119	.086	.062	.070	.051	.037	.023	.017	.012	
10.0	.194	.137	.098	.167	.119	.086	.116	.083	.061	.068	.049	.036	.022	.016	.012	

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-05-18

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:220.3V I:0.0810A P:17.00W PF:0.9490 Lamp Flux:1758.2x1 lm										
NAME: D290 18W 000 40K					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	18.4	19.9	18.8	20.2	20.6	18.7	20.2	19.1	20.5	20.9
3H	20.4	21.7	20.8	22.1	22.6	20.8	22.1	21.2	22.5	23.0
4H	21.4	22.7	21.9	23.1	23.6	21.9	23.1	22.3	23.6	24.0
6H	22.5	23.7	23.0	24.1	24.6	23.0	24.2	23.5	24.7	25.1
8H	23.1	24.2	23.6	24.7	25.2	23.6	24.8	24.1	25.3	25.8
12H	23.7	24.9	24.2	25.3	25.8	24.3	25.5	24.8	25.9	26.4
4H 2H	19.2	20.5	19.6	20.9	21.3	19.4	20.7	19.8	21.1	21.6
3H	21.4	22.5	21.9	23.0	23.5	21.7	22.8	22.2	23.3	23.8
4H	22.6	23.6	23.1	24.1	24.6	22.9	24.0	23.4	24.5	25.0
6H	23.8	24.8	24.4	25.3	25.9	24.3	25.2	24.8	25.7	26.3
8H	24.5	25.4	25.1	25.9	26.5	25.0	25.9	25.5	26.4	27.0
12H	25.3	26.1	25.8	26.6	27.2	25.8	26.6	26.4	27.2	27.8
8H 4H	23.1	24.0	23.6	24.5	25.1	23.4	24.3	23.9	24.8	25.4
6H	24.6	25.4	25.2	25.9	26.6	25.0	25.7	25.6	26.3	26.9
8H	25.5	26.2	26.1	26.7	27.4	25.9	26.6	26.5	27.1	27.8
12H	26.5	27.0	27.1	27.7	28.3	26.9	27.5	27.6	28.1	28.8
12H 4H	23.2	24.0	23.8	24.5	25.2	23.5	24.3	24.0	24.8	25.4
6H	24.9	25.5	25.5	26.1	26.8	25.2	25.8	25.8	26.4	27.1
8H	25.8	26.4	26.4	27.0	27.7	26.2	26.8	26.8	27.4	28.1
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 / - 0.3				

CIE Pub.117 Corrected 1758 lm Total Lamp Luminous Flux.(8log(F/F0) = 2.0)

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-05-18

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:220.3V I:0.0810A P:17.00W PF:0.9490 Lamp Flux:1758.2x1 lm		
NAME: D290 18W 000 40K	TYPE:LED	
MFR.:		

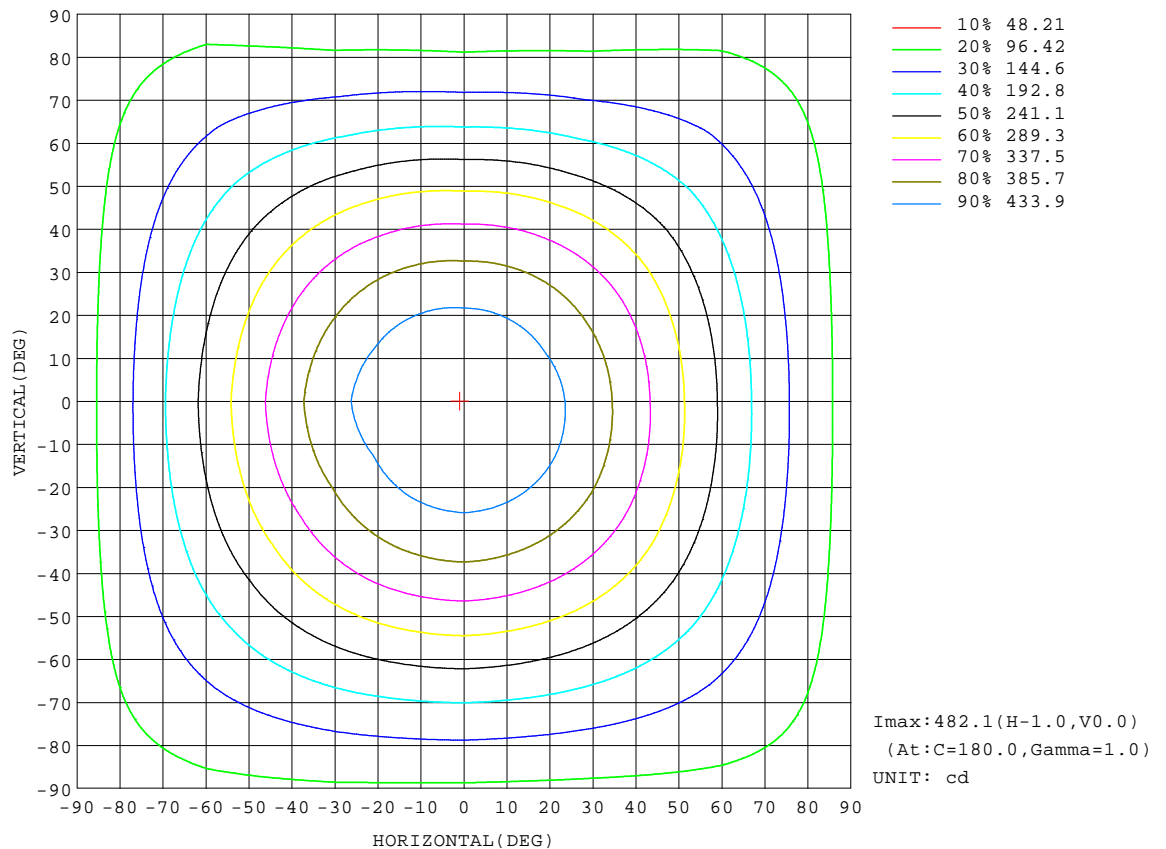
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	52	40	32	51	39	32	49	39	32	25
0.80	61	49	41	60	48	40	58	47	40	32
1.00	69	57	49	67	56	48	65	57	47	39
1.25	76	64	56	74	63	55	71	61	54	46
1.50	81	70	61	79	68	61	75	66	59	50
2.00	88	78	70	86	76	69	81	73	67	57
2.50	92	83	76	90	81	74	84	77	72	61
3.00	96	87	81	93	85	79	88	81	76	65
4.00	100	93	87	97	91	85	91	86	82	70
5.00	103	97	92	100	94	89	94	89	85	73
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:2018-05-18

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:220.3V I:0.0810A P:17.00W PF:0.9490 Lamp Flux:1758.2x1 lm		
NAME: D290 18W 000 40K	TYPE:LED	
MFR.:		



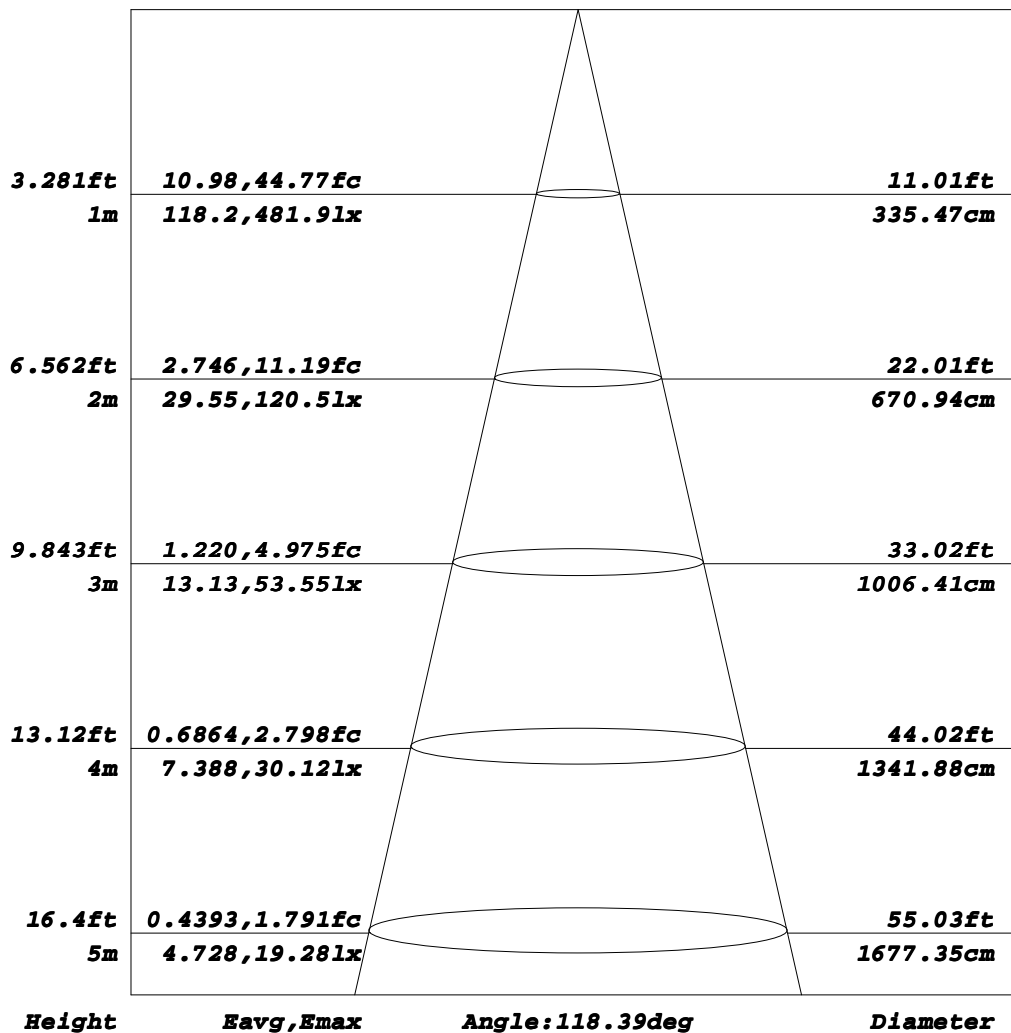
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-05-18

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:220.3V I:0.0810A P:17.00W PF:0.9490 Lamp Flux:1758.2x1 lm		
NAME: D290 18W 000 40K	TYPE:LED	
MFR.:		

Flux out:1114 lm



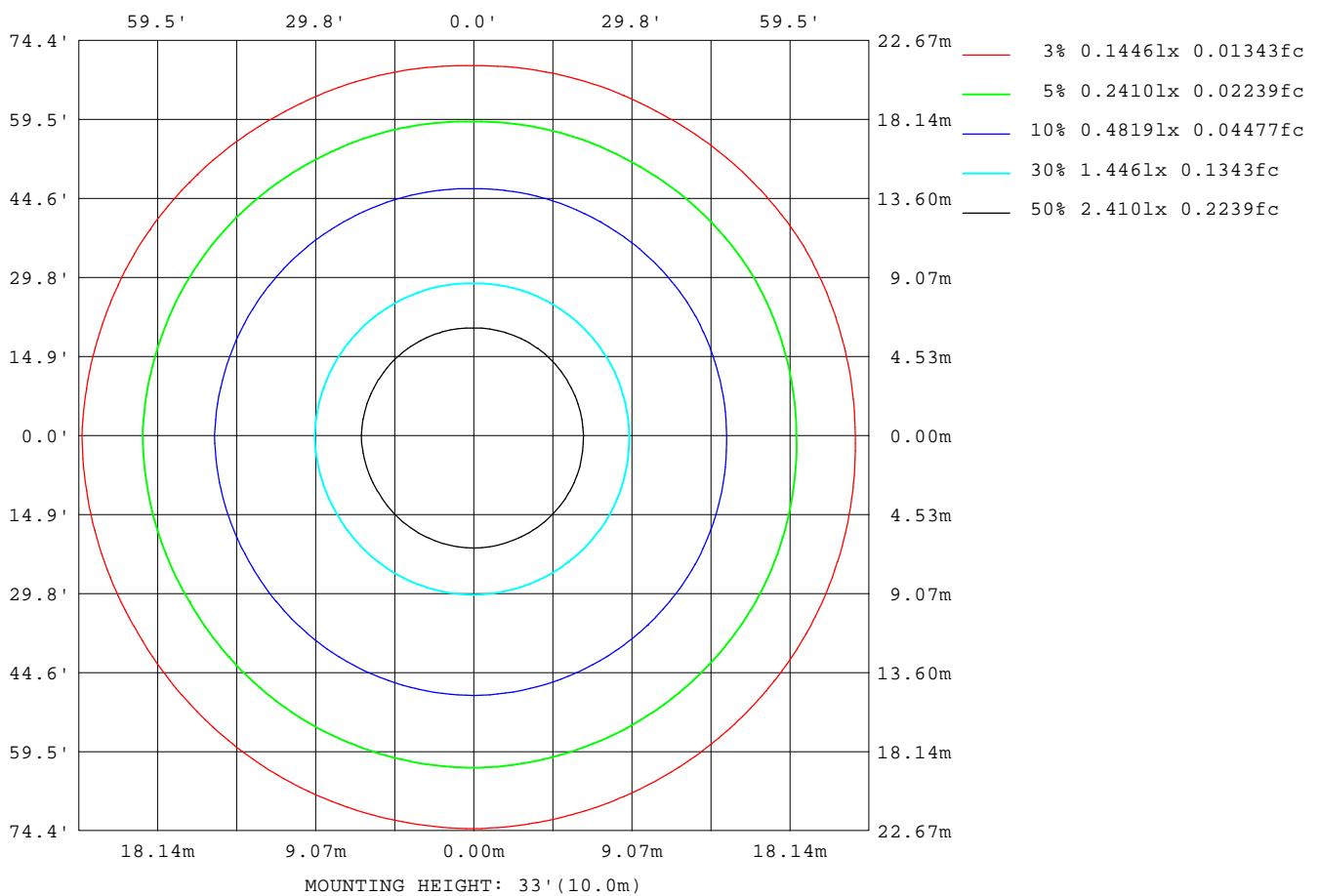
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-05-18

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

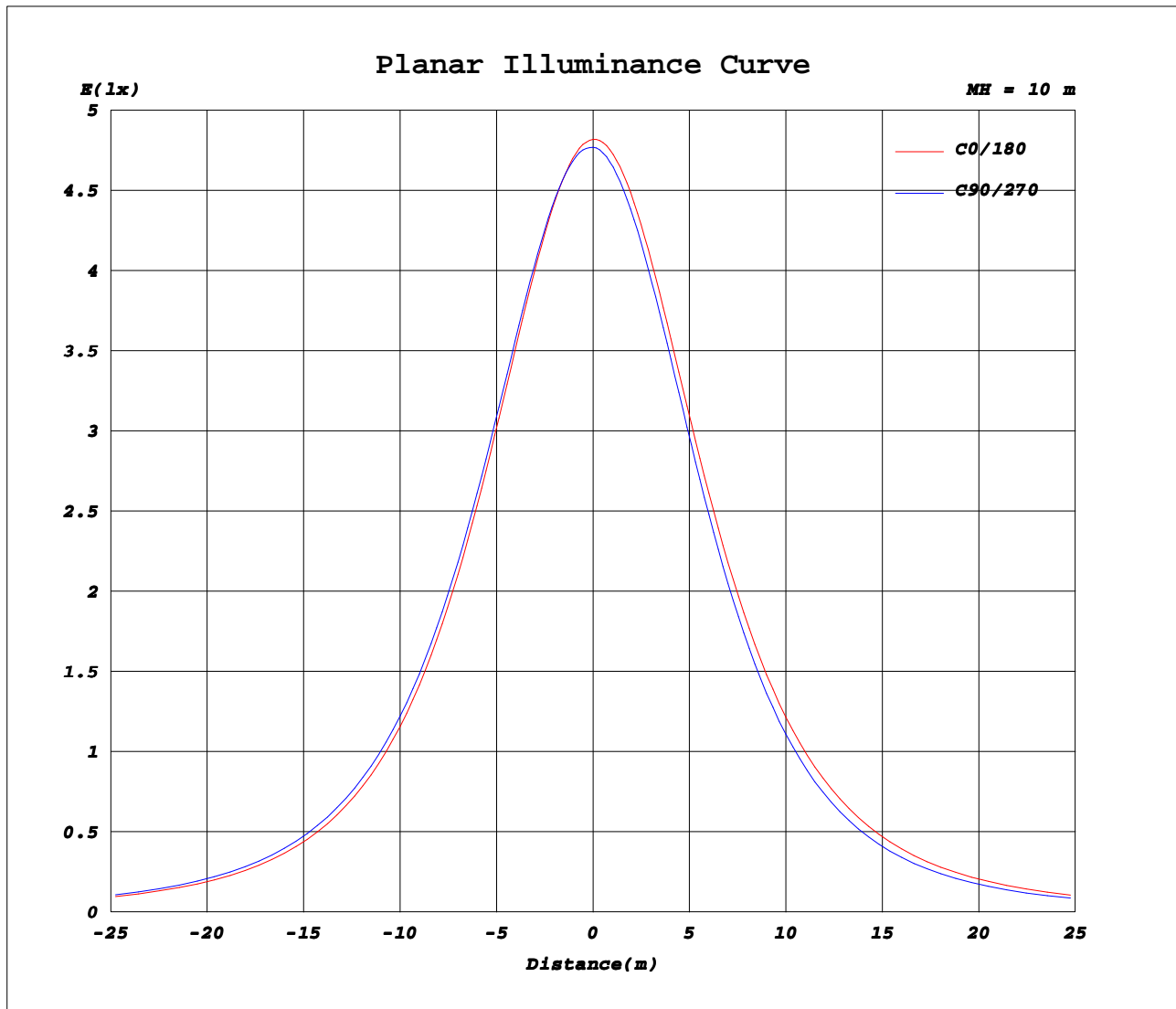
Test:U:220.3V I:0.0810A P:17.00W PF:0.9490 Lamp Flux:1758.2x1 lm		
NAME: D290 18W 000 40K	TYPE:LED	
MFR.:		



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-05-18

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: 2018-05-18

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:220.3V I:0.0810A P:17.00W PF:0.9490 Lamp Flux:1758.2x1 lm																	
NAME: D290 18W 000 40K									TYPE:LED								
MFR.:																	

Table--1

UNIT: cd

γ (DEG)	C (DEG)																		
	0	30	60	90	120	150	180	210	240	270	300	330							
0	482	480	478	477	476	475	482	480	478	477	476	475							
5	479	478	477	477	476	474	481	477	475	473	473	472							
10	472	472	472	472	471	469	476	471	468	465	465	465							
15	461	463	463	464	463	460	467	461	458	454	454	454							
20	446	449	451	452	451	448	454	447	443	439	440	440							
25	428	433	435	437	435	432	438	430	425	421	421	423							
30	407	413	416	419	417	413	419	410	404	398	400	402							
35	383	390	394	397	395	391	396	387	379	373	375	378							
40	357	364	369	373	370	366	371	361	351	344	348	352							
45	327	336	341	346	343	339	344	333	322	314	317	324							
50	297	307	312	317	315	310	315	303	291	282	286	294							
55	266	275	281	286	284	280	284	272	258	249	253	263							
60	234	244	250	255	253	249	252	240	225	216	220	232							
65	204	213	219	224	222	218	221	209	193	185	189	202							
70	175	184	189	194	192	189	189	180	163	155	159	173							
75	148	156	160	165	164	160	157	151	135	127	131	147							
80	123	131	134	139	137	133	127	124	109	102	107	122							
85	99.7	106	110	113	113	108	98.6	102	87.2	79.3	86.6	99.3							
90	79.3	85.7	88.1	91.2	91.3	87.3	74.3	83.1	69.8	60.9	69.7	79.8							
95	55.0	67.5	69.7	71.1	72.4	69.5	59.8	66.0	55.5	48.2	55.4	62.9							
100	40.2	52.1	53.8	47.3	56.2	54.1	44.6	51.4	43.9	37.9	43.4	48.7							
105	31.3	39.3	40.4	36.9	42.2	41.2	35.9	39.7	34.0	29.3	33.6	37.1							
110	24.6	29.2	30.0	28.5	30.9	30.9	28.3	30.3	26.2	22.9	24.4	27.7							
115	19.7	22.0	22.8	22.4	22.7	23.1	22.5	23.1	20.7	18.8	18.3	20.9							
120	16.4	17.7	18.3	18.1	17.7	18.4	18.8	18.4	17.3	16.5	15.8	17.1							
125	14.1	15.4	15.6	15.3	15.1	15.8	16.5	15.9	15.2	14.6	14.3	14.9							
130	12.4	13.5	13.7	13.4	13.4	13.9	14.6	14.0	13.6	13.0	13.5	12.9							
135	11.2	12.1	12.2	11.9	12.1	12.4	13.1	12.7	12.4	11.8	12.3	10.5							
140	10.4	11.1	11.1	10.9	11.2	11.4	12.0	11.6	11.5	10.9	11.2	10.7							
145	10.0	10.5	10.4	10.3	10.5	10.7	11.4	11.0	10.8	10.4	10.6	10.3							
150	9.92	10.2	10.0	9.95	10.2	10.3	11.0	10.6	10.5	10.2	10.3	10.2							
155	10.1	10.1	9.92	9.92	10.1	10.2	10.7	10.5	10.4	10.2	10.2	10.2							
160	10.5	10.3	10.1	10.2	10.1	10.1	10.7	10.5	10.5	10.5	10.4	10.4							
165	10.8	10.6	10.5	10.5	10.5	10.4	11.0	10.8	10.8	10.8	10.7	10.7							
170	11.1	11.0	10.8	10.9	10.8	10.7	11.2	11.0	11.0	11.0	10.9	10.9							
175	11.3	11.2	11.1	11.2	11.1	11.0	11.4	11.2	11.2	11.2	11.0	11.0							
180	11.5	11.4	11.3	11.4	11.2	11.2	11.5	11.4	11.3	11.3	11.2	11.2							

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-05-18

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: