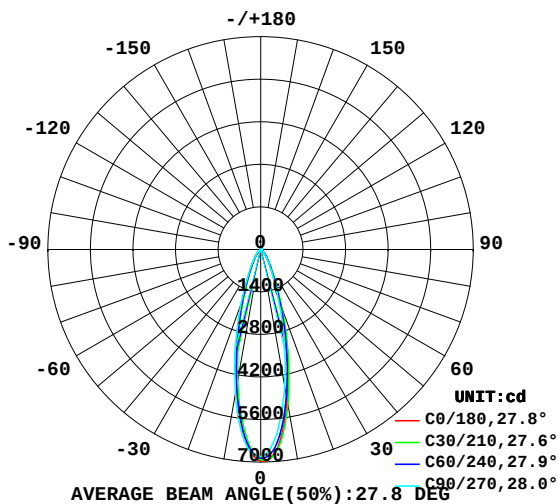


LUMINAIRE PHOTOMETRIC TEST REPORT

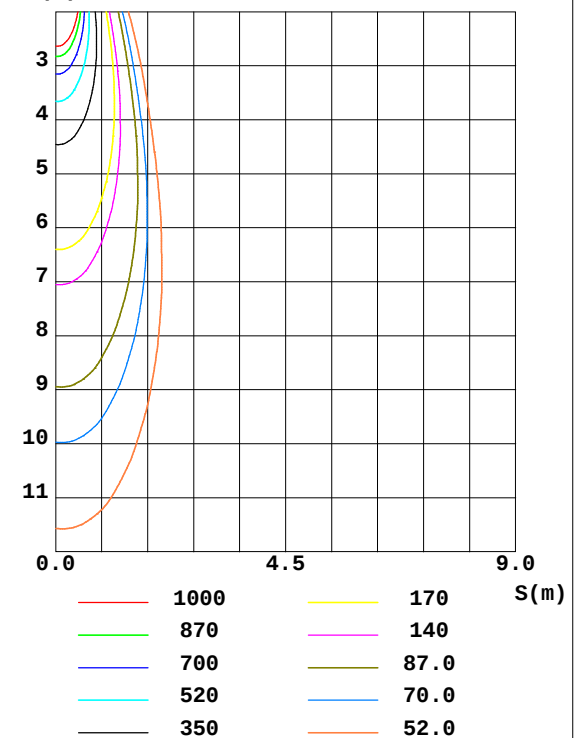
Test:U:221.1V I:0.0940A P:19.20W PF:0.9190 Lamp Flux:2370.41x1 lm		
NAME: PS-TL20W40KD2480RA-G	TYPE: LED	
MFR.:		

DATA OF LAMP		PHOTOMETRIC DATA Eff: 123.46 lm/W			
MODEL	PS-TL20W40KD2480RA-G	I _{max} (cd)	6967	S/MH(C0/180)	0.49
NOMINAL POWER(W)	20	LOR(%)	100.0	S/MH(C90/270)	0.45
RATED VOLTAGE(V)	222	TOTAL FLUX(lm)	2370.4	η UP, DN(C0-180)	1.7, 46.6
NOMINAL FLUX(lm)	2370.41	CIE CLASS	DIRECT	η UP, DN(C180-360)	1.7, 50.0
LAMPS INSIDE	1	η up(%)	3.4	CIBSE SHR NOM	0.50
TEST VOLTAGE(V)	221.2	η down(%)	96.6	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: 2018-11-07

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

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	5049	5037	4563	4099	4576	4492	4801	5347	0- 10	546.9	546.9	23.1,23.1
20	1970	1956	1687	1433	1663	1638	1877	2270	10- 20	855.6	1403	59.2,59.2
30	641.5	637.4	570.5	503.9	570.5	567.5	637.0	749.3	20- 30	485.5	1888	79.6,79.6
40	261.5	253.8	226.2	196.8	228.7	221.5	255.4	295.4	30- 40	243.9	2132	89.9,89.9
50	80.88	77.64	65.80	50.70	67.85	62.91	76.81	96.49	40- 50	111.4	2243	94.6,94.6
60	12.13	12.06	10.29	8.880	11.93	11.85	13.12	15.22	50- 60	28.86	2272	95.9,95.9
70	4.987	4.959	4.721	4.502	7.464	7.300	7.166	7.308	60- 70	7.989	2280	96.2,96.2
80	2.308	2.362	1.849	1.175	5.341	5.269	5.595	6.097	70- 80	5.458	2286	96.4,96.4
90	1.410	1.452	1.586	1.703	5.466	5.383	5.244	5.162	80- 90	3.532	2289	96.6,96.6
100	2.608	2.670	2.965	3.220	6.020	5.939	5.800	5.710	90-100	4.201	2293	96.7,96.7
110	5.168	5.314	5.918	6.398	7.407	7.339	7.046	6.777	100-110	5.566	2299	97,97
120	9.545	9.754	10.53	11.16	10.16	10.04	9.593	9.157	110-120	8.036	2307	97.3,97.3
130	14.91	14.98	15.60	16.33	13.93	13.78	13.15	12.59	120-130	10.87	2318	97.8,97.8
140	20.18	20.10	20.49	21.42	19.44	19.20	18.21	17.47	130-140	13.02	2331	98.3,98.3
150	25.98	25.71	25.58	26.99	26.32	25.82	24.30	23.92	140-150	14.08	2345	98.9,98.9
160	32.15	31.54	30.83	32.09	32.53	31.30	29.55	29.93	150-160	13.13	2358	99.5,99.5
170	35.15	33.97	32.75	32.92	34.37	32.42	31.31	32.24	160-170	9.217	2367	99.9,99.9
180	34.58	32.75	31.50	32.11	34.66	32.76	31.42	32.12	170-180	3.122	2370	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

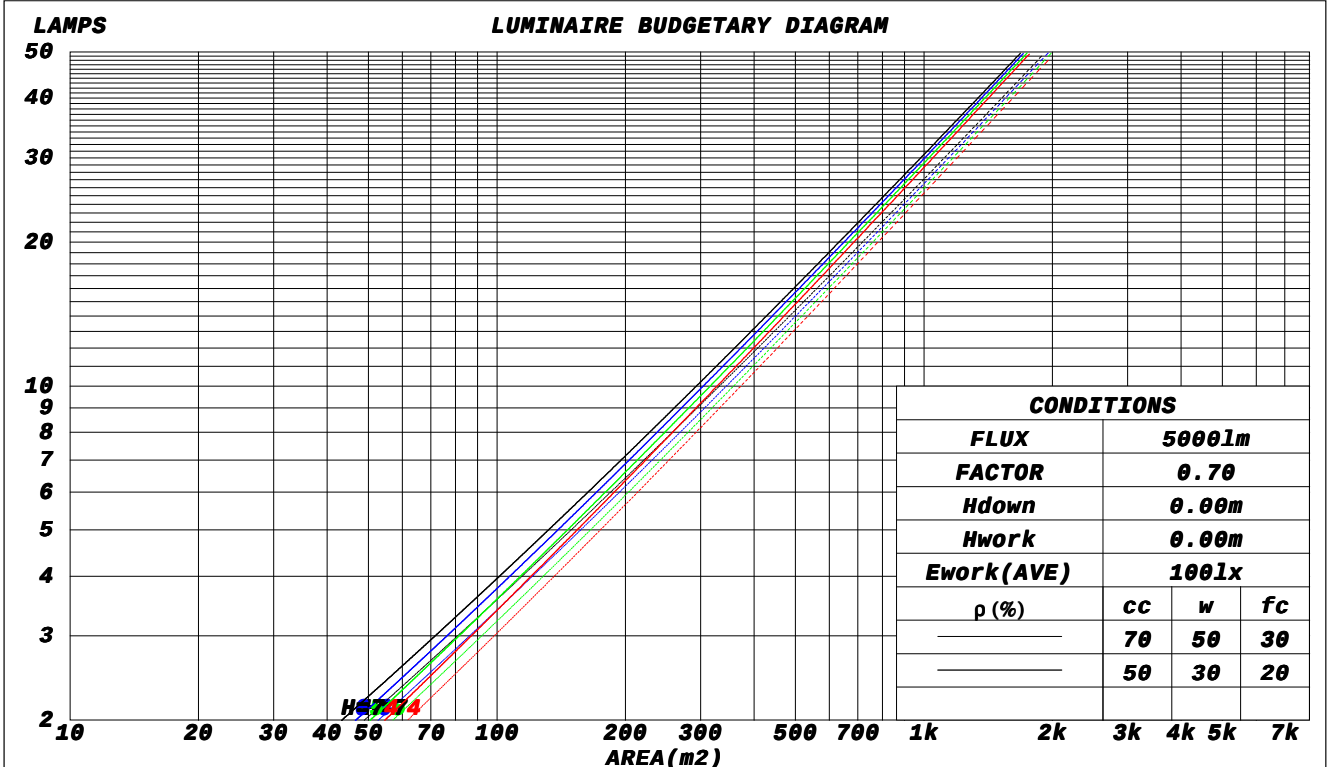
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-11-07

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:221.1V I:0.0940A P:19.20W PF:0.9190 Lamp Flux:2370.41x1 lm		
NAME: PS-TL20W40KD2480RA-G	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	1.08	1.06	1.08	1.06	1.04	1.04	1.02	1.01	.99	.98	.97	.95	.94	.94	.92
2.0	1.04	1.00	.97	1.02	.99	.96	.98	.96	.93	.95	.93	.91	.92	.90	.89	.87
3.0	.98	.94	.90	.97	.92	.89	.93	.90	.87	.91	.88	.86	.88	.86	.84	.82
4.0	.93	.88	.84	.92	.87	.84	.89	.85	.82	.87	.84	.81	.85	.82	.80	.78
5.0	.88	.83	.79	.87	.82	.79	.85	.81	.78	.83	.80	.77	.81	.78	.76	.75
6.0	.84	.79	.75	.83	.78	.75	.81	.77	.74	.80	.76	.73	.78	.75	.73	.71
7.0	.80	.75	.71	.79	.75	.71	.78	.74	.71	.76	.73	.70	.75	.72	.69	.68
8.0	.77	.72	.68	.76	.71	.68	.75	.70	.67	.74	.70	.67	.72	.69	.66	.65
9.0	.74	.69	.65	.73	.68	.65	.72	.68	.65	.71	.67	.64	.70	.66	.64	.63
10.0	.71	.66	.62	.70	.65	.62	.69	.65	.62	.68	.64	.62	.67	.64	.61	.60



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2018-11-07

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:221.1V I:0.0940A P:19.20W PF:0.9190 Lamp Flux:2370.41x1 lm											
NAME: PS-TL20W40KD2480RA-G						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	.163	.093	.029	.156	.089	.028	.141	.081	.026	.128	.074	.024	.116	.067	.022	
2.0	.153	.084	.026	.147	.081	.025	.135	.075	.023	.123	.069	.022	.113	.064	.020	
3.0	.144	.077	.023	.139	.074	.022	.128	.070	.021	.119	.065	.020	.110	.061	.019	
4.0	.136	.071	.021	.131	.069	.020	.122	.065	.019	.114	.061	.018	.106	.058	.018	
5.0	.129	.066	.019	.125	.064	.019	.117	.061	.018	.109	.058	.017	.102	.055	.016	
6.0	.122	.061	.018	.119	.060	.017	.112	.057	.017	.105	.055	.016	.099	.052	.015	
7.0	.116	.058	.016	.113	.056	.016	.107	.054	.016	.101	.052	.015	.095	.050	.015	
8.0	.111	.054	.015	.108	.053	.015	.102	.051	.015	.097	.049	.014	.092	.047	.014	
9.0	.106	.051	.014	.103	.050	.014	.098	.049	.014	.093	.047	.013	.089	.045	.013	
10.0	.101	.049	.014	.099	.048	.013	.094	.046	.013	.090	.045	.013	.086	.043	.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	.217	.217	.217	.185	.185	.185	.126	.126	.126	.073	.073	.073	.023	.023	.023	
1.0	.196	.184	.172	.168	.158	.148	.115	.109	.103	.066	.063	.060	.021	.020	.019	
2.0	.180	.159	.141	.154	.137	.122	.106	.095	.085	.061	.055	.050	.020	.018	.016	
3.0	.167	.140	.119	.143	.121	.103	.098	.084	.072	.057	.049	.043	.018	.016	.014	
4.0	.156	.125	.102	.134	.108	.089	.092	.075	.062	.053	.044	.037	.017	.014	.012	
5.0	.146	.113	.089	.126	.098	.078	.087	.069	.055	.050	.040	.032	.016	.013	.011	
6.0	.138	.104	.079	.119	.090	.069	.082	.063	.049	.048	.037	.029	.015	.012	.010	
7.0	.131	.096	.071	.113	.083	.062	.078	.058	.044	.045	.034	.026	.015	.011	.009	
8.0	.125	.090	.065	.108	.078	.057	.075	.055	.040	.043	.032	.024	.014	.011	.008	
9.0	.120	.084	.060	.103	.073	.053	.072	.051	.037	.042	.030	.022	.013	.010	.007	
10.0	.115	.080	.056	.099	.069	.049	.069	.049	.035	.040	.029	.021	.013	.009	.007	

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-11-07

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:221.1V I:0.0940A P:19.20W PF:0.9190 Lamp Flux:2370.41x1 lm										
NAME: PS-TL20W40KD2480RA-G					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	18.1	18.9	18.3	19.1	19.3	17.4	18.2	17.7	18.4	18.7
3H	17.9	18.7	18.2	18.9	19.2	17.3	18.0	17.6	18.3	18.5
4H	17.9	18.6	18.2	18.8	19.1	17.2	17.9	17.5	18.2	18.5
6H	17.8	18.4	18.1	18.7	19.0	17.2	17.8	17.5	18.1	18.4
8H	17.8	18.4	18.1	18.7	19.0	17.1	17.7	17.5	18.0	18.4
12H	17.7	18.3	18.1	18.6	19.0	17.1	17.7	17.4	18.0	18.3
4H 2H	17.8	18.5	18.2	18.8	19.1	17.2	17.9	17.5	18.2	18.5
3H	17.7	18.3	18.1	18.6	19.0	17.1	17.7	17.4	18.0	18.3
4H	17.6	18.2	18.0	18.5	18.9	17.0	17.6	17.4	17.9	18.3
6H	17.6	18.1	18.0	18.4	18.9	16.9	17.4	17.4	17.8	18.2
8H	17.5	18.0	18.0	18.4	18.8	16.9	17.3	17.3	17.7	18.2
12H	17.5	17.9	17.9	18.3	18.8	16.8	17.3	17.3	17.7	18.1
8H 4H	17.5	17.9	17.9	18.4	18.8	16.9	17.3	17.3	17.7	18.2
6H	17.4	17.8	17.9	18.3	18.7	16.8	17.2	17.3	17.6	18.1
8H	17.4	17.7	17.9	18.2	18.7	16.8	17.1	17.3	17.6	18.1
12H	17.3	17.6	17.9	18.1	18.7	16.7	17.0	17.2	17.5	18.0
12H 4H	17.4	17.8	17.9	18.3	18.7	16.8	17.2	17.3	17.7	18.1
6H	17.4	17.7	17.9	18.2	18.7	16.7	17.1	17.3	17.6	18.1
8H	17.3	17.6	17.8	18.1	18.6	16.7	17.0	17.2	17.5	18.0
Variations with the observer position at spacings:										
S = 1.0H	+ 2.4 / - 7.9					+ 2.4 / - 8.0				
1.5H	+ 3.5 / - 6.1					+ 3.3 / - 6.1				
2.0H	+ 5.4 / - 6.6					+ 5.2 / - 6.3				

CIE Pub.117 Corrected 2370 lm Total Lamp Luminous Flux. (8log(F/F0) = 3.0)

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-11-07

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:221.1V I:0.0940A P:19.20W PF:0.9190 Lamp Flux:2370.41x1 lm		
NAME: PS-TL20W40KD2480RA-G	TYPE: LED	
MFR.:		

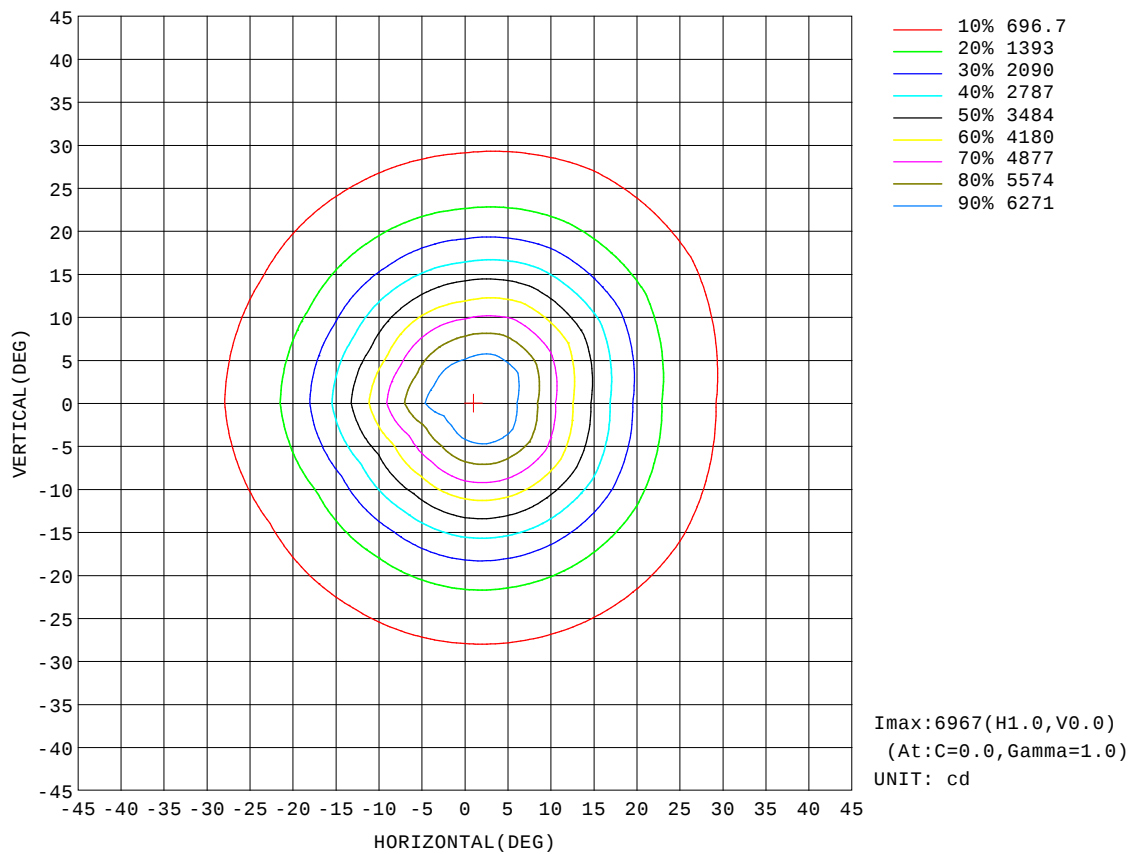
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	85	79	75	85	78	75	84	78	74	71
0.80	93	87	83	92	86	83	90	85	82	78
1.00	97	92	88	96	91	87	94	91	87	82
1.25	101	96	93	100	95	92	98	94	91	86
1.50	104	99	96	103	98	95	100	97	94	89
2.00	107	103	99	105	101	98	102	99	97	91
2.50	109	105	102	107	103	101	103	101	98	92
3.00	110	107	104	108	105	103	104	102	100	93
4.00	113	110	107	110	108	106	106	104	102	94
5.00	114	111	109	111	109	108	107	105	104	95
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: 2018-11-07

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:221.1V I:0.0940A P:19.20W PF:0.9190 Lamp Flux:2370.41x1 lm		
NAME: PS-TL20W40KD2480RA-G	TYPE: LED	
MFR.:		



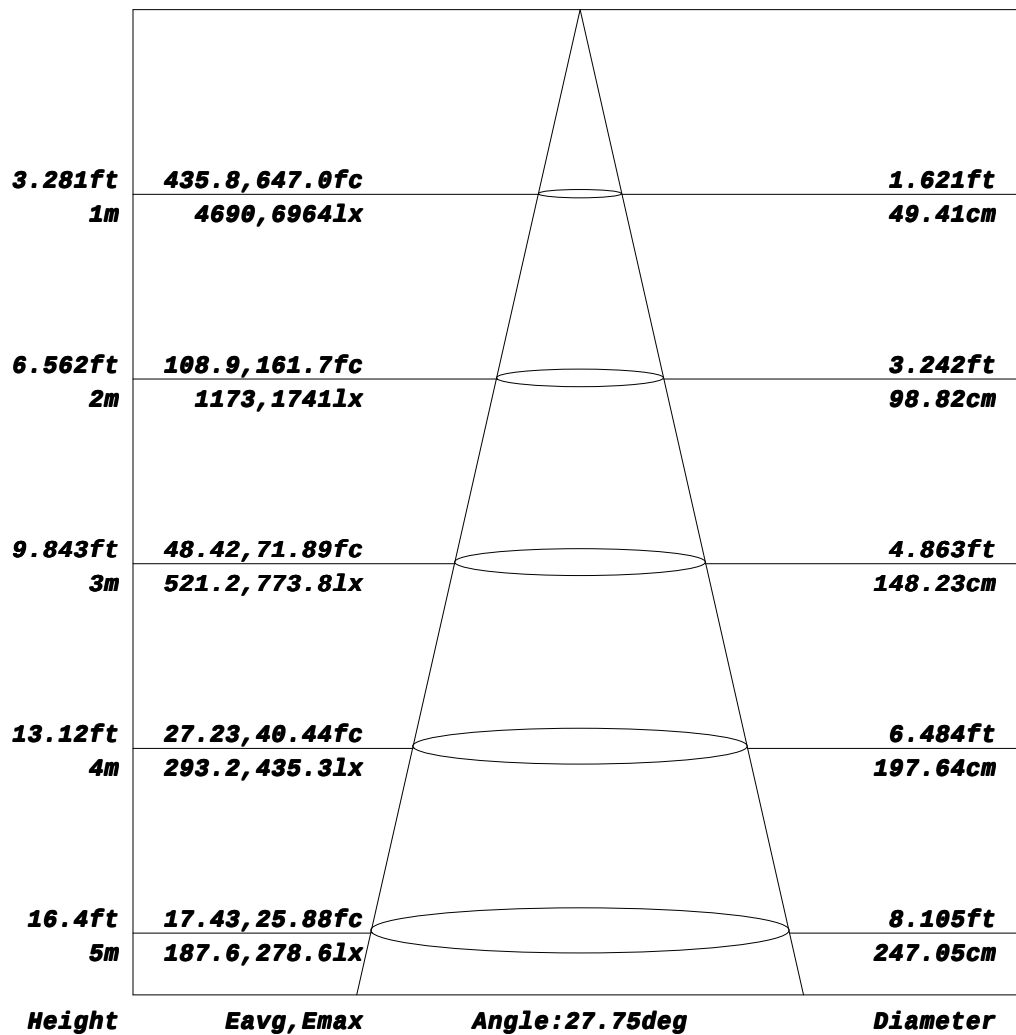
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-11-07

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:221.1V I:0.0940A P:19.20W PF:0.9190 Lamp Flux:2370.41x1 lm		
NAME: PS-TL20W40KD2480RA-G	TYPE: LED	
MFR.:		

Flux out:916.0 lm



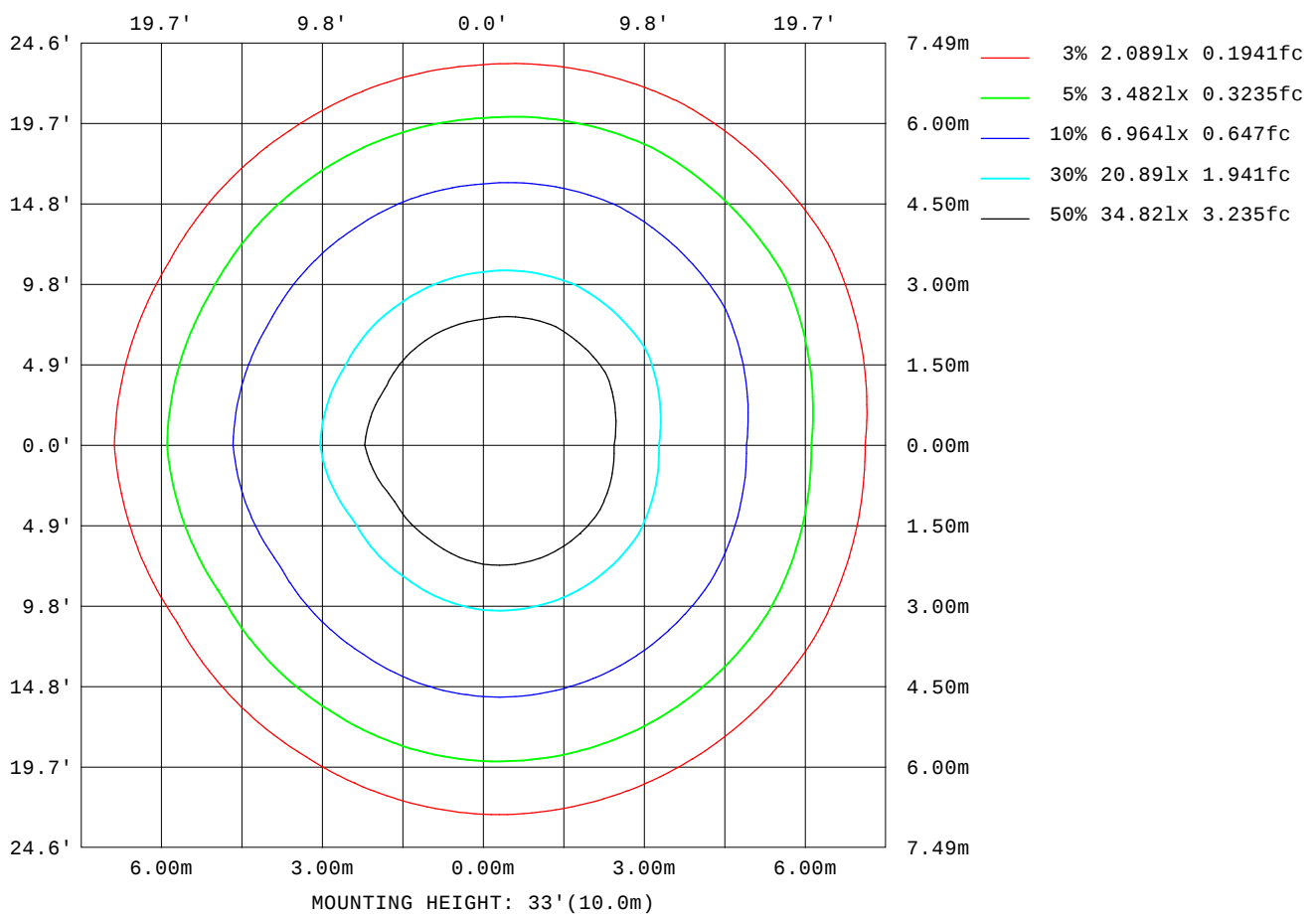
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-11-07

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

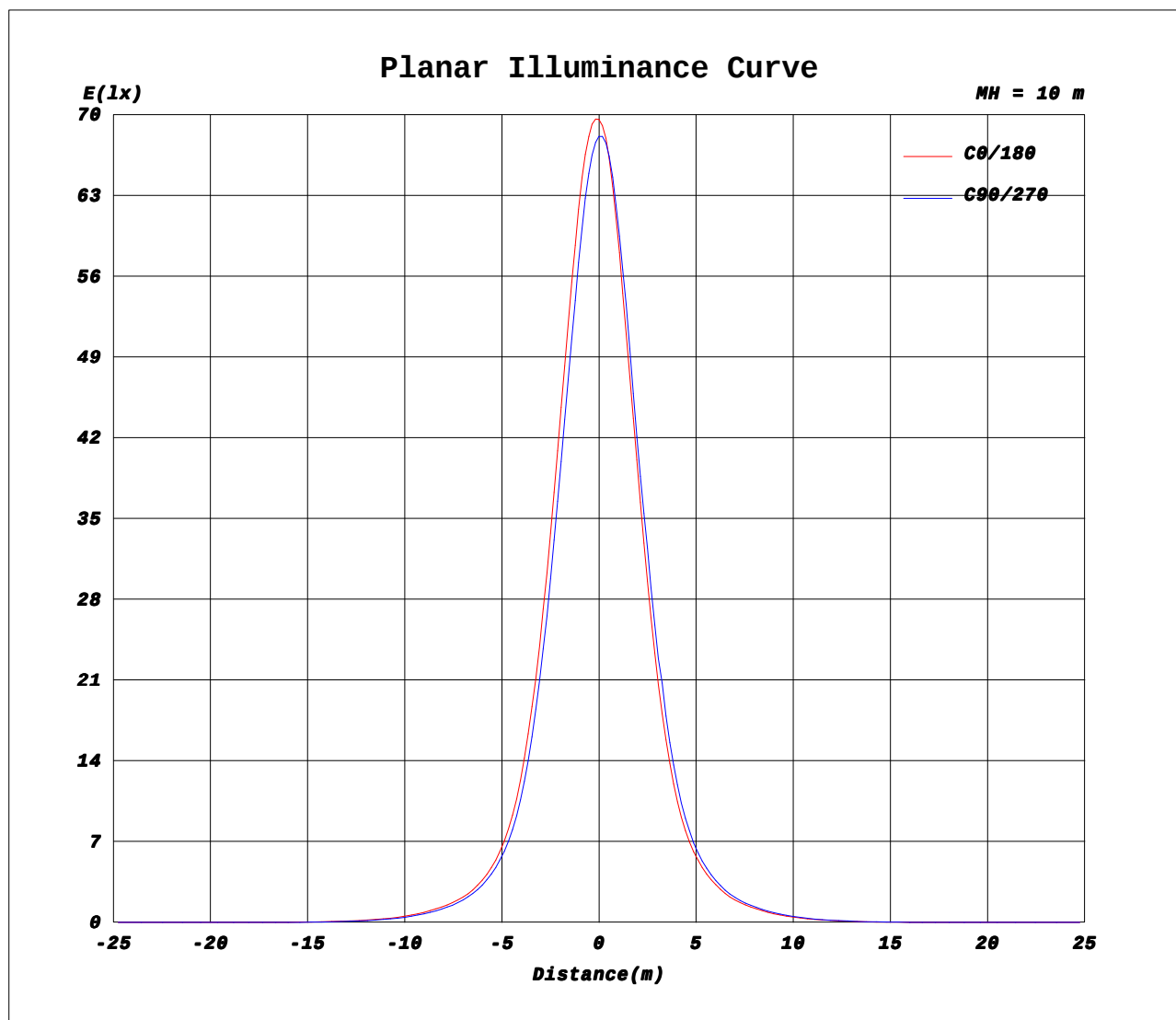
Test:U:221.1V I:0.0940A P:19.20W PF:0.9190 Lamp Flux:2370.41x1 lm		
NAME: PS-TL20W40KD2480RA-G	TYPE: LED	
MFR.:		



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-11-07

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: 2018-11-07

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:221.1V I:0.0940A P:19.20W PF:0.9190 Lamp Flux:2370.41x1 lm											
NAME: PS-TL20W40KD2480RA-G						TYPE: LED					
MFR.:											

Table--1

UNIT: cd

γ (DEG)	C (DEG)																			
	0	30	60	90	120	150	180	210	240	270	300	330								
0	6960	6918	6869	6812	6764	6775	6960	6918	6869	6812	6764	6775								
5	6531	6575	6371	6085	5760	5678	6182	6026	6169	6293	6591	6676								
10	5049	5170	4905	4563	4159	4039	4576	4377	4608	4801	5290	5404								
15	3364	3462	3243	2948	2606	2487	2931	2794	2972	3220	3665	3795								
20	1970	2028	1884	1687	1477	1390	1663	1581	1696	1877	2211	2328								
25	1089	1116	1038	946	842	801	934	898	955	1064	1238	1304								
30	641	659	615	571	517	491	571	551	584	637	736	762								
35	400	405	381	356	321	310	357	340	360	396	452	470								
40	261	261	246	226	200	193	229	215	228	255	289	302								
45	153	155	142	128	109	105	130	120	131	147	176	184								
50	80.9	80.8	74.5	65.8	51.7	49.7	67.9	59.1	66.7	76.8	93.4	99.6								
55	32.2	33.6	29.0	21.1	16.1	15.3	21.8	20.1	22.6	28.3	39.8	45.6								
60	12.1	12.5	11.6	10.3	9.18	8.58	11.9	11.6	12.1	13.1	14.9	15.6								
65	7.08	7.32	6.83	6.16	5.64	5.42	8.30	8.18	8.23	8.72	9.54	9.78								
70	4.99	5.04	4.88	4.72	4.57	4.43	7.46	7.37	7.23	7.17	7.27	7.35								
75	4.11	4.09	3.96	3.92	3.42	3.15	7.03	6.81	6.83	6.87	6.89	7.00								
80	2.31	2.48	2.25	1.85	1.21	1.14	5.34	5.19	5.35	5.60	5.96	6.23								
85	1.13	1.14	1.18	1.25	1.32	1.31	5.18	5.14	5.03	4.90	4.81	4.78								
90	1.42	1.42	1.49	1.59	1.70	1.70	5.47	5.43	5.33	5.24	5.17	5.16								
95	1.90	1.89	2.00	2.15	2.31	2.32	5.72	5.68	5.59	5.51	5.44	5.44								
100	2.61	2.59	2.75	2.96	3.20	3.24	6.02	5.99	5.89	5.80	5.72	5.70								
105	3.66	3.63	3.88	4.19	4.54	4.58	6.55	6.54	6.39	6.27	6.13	6.09								
110	5.17	5.16	5.47	5.92	6.36	6.43	7.41	7.43	7.25	7.05	6.81	6.75								
115	7.18	7.16	7.56	8.09	8.63	8.71	8.63	8.67	8.41	8.17	7.85	7.76								
120	9.54	9.54	9.97	10.5	11.1	11.2	10.2	10.2	9.91	9.59	9.21	9.11								
125	12.2	12.1	12.6	13.1	13.7	13.8	11.9	11.9	11.6	11.2	10.8	10.7								
130	14.9	14.8	15.2	15.6	16.3	16.4	13.9	14.0	13.6	13.1	12.6	12.5								
135	17.5	17.4	17.7	18.0	18.7	19.0	16.4	16.5	16.0	15.5	14.8	14.7								
140	20.2	20.0	20.2	20.5	21.2	21.6	19.4	19.5	18.9	18.2	17.6	17.4								
145	23.0	22.8	22.9	23.0	23.9	24.4	22.8	22.8	22.1	21.6	20.7	20.5								
150	26.0	25.8	25.7	25.6	26.5	27.4	26.3	26.3	25.4	24.3	24.0	23.9								
155	29.1	28.9	28.6	28.3	29.2	30.4	29.6	29.5	28.3	27.1	27.1	27.2								
160	32.1	31.8	31.3	30.8	31.5	32.7	32.5	32.0	30.6	29.5	29.7	30.1								
165	34.4	33.9	33.1	32.5	32.7	33.7	34.3	33.2	31.9	31.1	31.4	32.1								
170	35.1	34.5	33.5	32.8	32.6	33.2	34.4	33.0	31.9	31.3	31.8	32.7								
175	34.8	34.0	32.8	32.0	31.7	32.5	33.8	32.4	31.2	30.7	31.2	32.3								
180	34.6	33.4	32.1	31.5	31.6	32.6	34.7	33.4	32.1	31.4	31.6	32.6								

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-11-07

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: