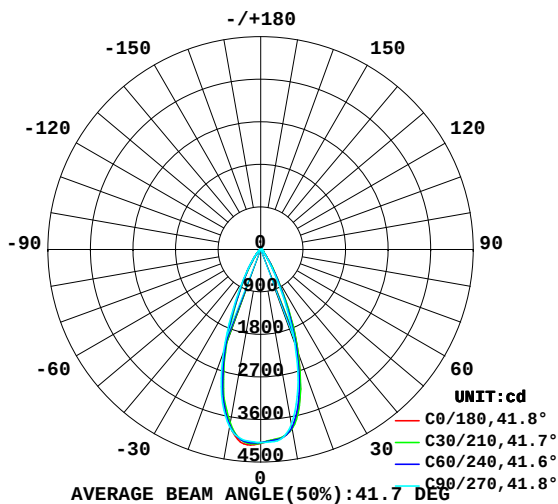


LUMINAIRE PHOTOMETRIC TEST REPORT

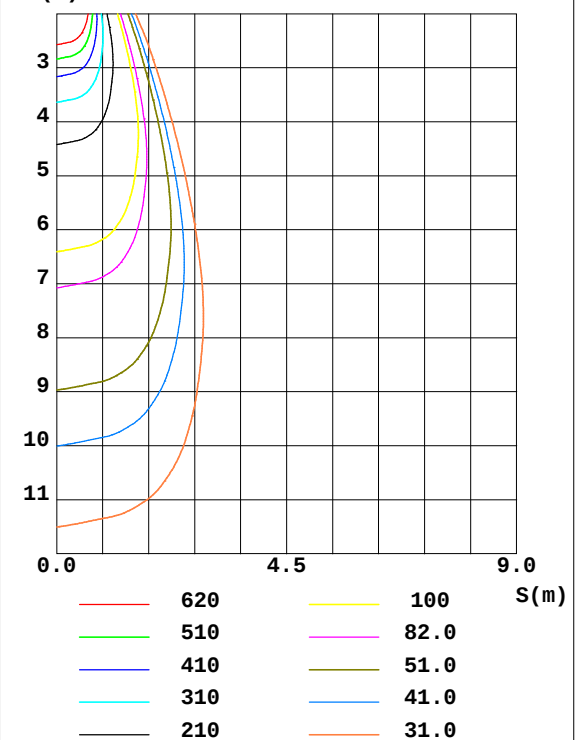
Test:U:221.1V I:0.0970A P:19.70W PF:0.9170 Lamp Flux:2287.92x1 lm		
NAME: PS-TL20W40KD3880RA-D	TYPE: LED	
MFR.:		

DATA OF LAMP		PHOTOMETRIC DATA Eff: 116.14 lm/W			
MODEL	PS-TL20W40KD3880RA-D	I _{max} (cd)	4140	S/MH(C0/180)	0.66
NOMINAL POWER(W)	20	LOR(%)	100.0	S/MH(C90/270)	0.64
RATED VOLTAGE(V)	222	TOTAL FLUX(lm)	2287.9	η UP, DN(C0-180)	1.7, 46.3
NOMINAL FLUX(lm)	2287.92	CIE CLASS	DIRECT	η UP, DN(C180-360)	1.7, 50.3
LAMPS INSIDE	1	η up(%)	3.4	CIBSE SHR NOM	0.50
TEST VOLTAGE(V)	221.2	η down(%)	96.6	CIBSE SHR MAX	0.65

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	3842	3835	3757	3602	3789	3752	3807	3871	0- 10	378.4	378.4	16.5,16.5
20	2317	2274	2117	1925	2171	2141	2299	2497	10- 20	849.1	1228	53.7,53.7
30	695.5	681.4	601.8	544.4	675.5	667.7	736.4	829.7	20- 30	606.1	1834	80.1,80.1
40	182.3	179.6	156.9	140.8	180.8	185.6	202.8	223.6	30- 40	231.6	2065	90.3,90.3
50	62.59	62.76	55.58	51.07	64.39	65.57	68.96	74.09	40- 50	83.78	2149	93.9,93.9
60	23.93	23.88	21.61	20.08	25.82	26.44	27.53	28.79	50- 60	36.16	2185	95.5,95.5
70	7.729	8.021	7.305	6.218	10.00	10.21	10.85	11.28	60- 70	16.16	2201	96.2,96.2
80	1.019	1.082	1.081	0.9743	4.322	4.277	4.196	4.135	70- 80	5.024	2206	96.4,96.4
90	1.340	1.363	1.438	1.503	4.909	4.947	4.826	4.726	80- 90	3.045	2209	96.6,96.6
100	2.777	2.839	3.038	3.218	5.862	5.794	5.668	5.571	90-100	4.018	2213	96.7,96.7
110	5.671	5.782	6.144	6.405	7.248	7.177	6.984	6.817	100-110	5.654	2219	97,97
120	9.751	9.865	10.26	10.58	9.573	9.455	9.155	8.901	110-120	7.955	2227	97.3,97.3
130	14.65	14.69	15.00	15.43	13.41	13.28	12.79	12.37	120-130	10.48	2238	97.8,97.8
140	19.89	19.86	19.93	20.58	18.73	18.47	17.70	17.36	130-140	12.68	2250	98.4,98.4
150	25.70	25.33	25.07	25.93	24.99	24.36	23.26	23.18	140-150	13.67	2264	98.9,98.9
160	30.69	29.94	29.52	29.85	30.09	28.99	28.07	28.19	150-160	12.55	2276	99.5,99.5
170	32.24	31.24	30.57	30.46	31.40	29.98	29.35	29.71	160-170	8.534	2285	99.9,99.9
180	33.33	31.99	31.24	31.39	33.43	32.00	31.18	31.40	170-180	2.950	2288	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

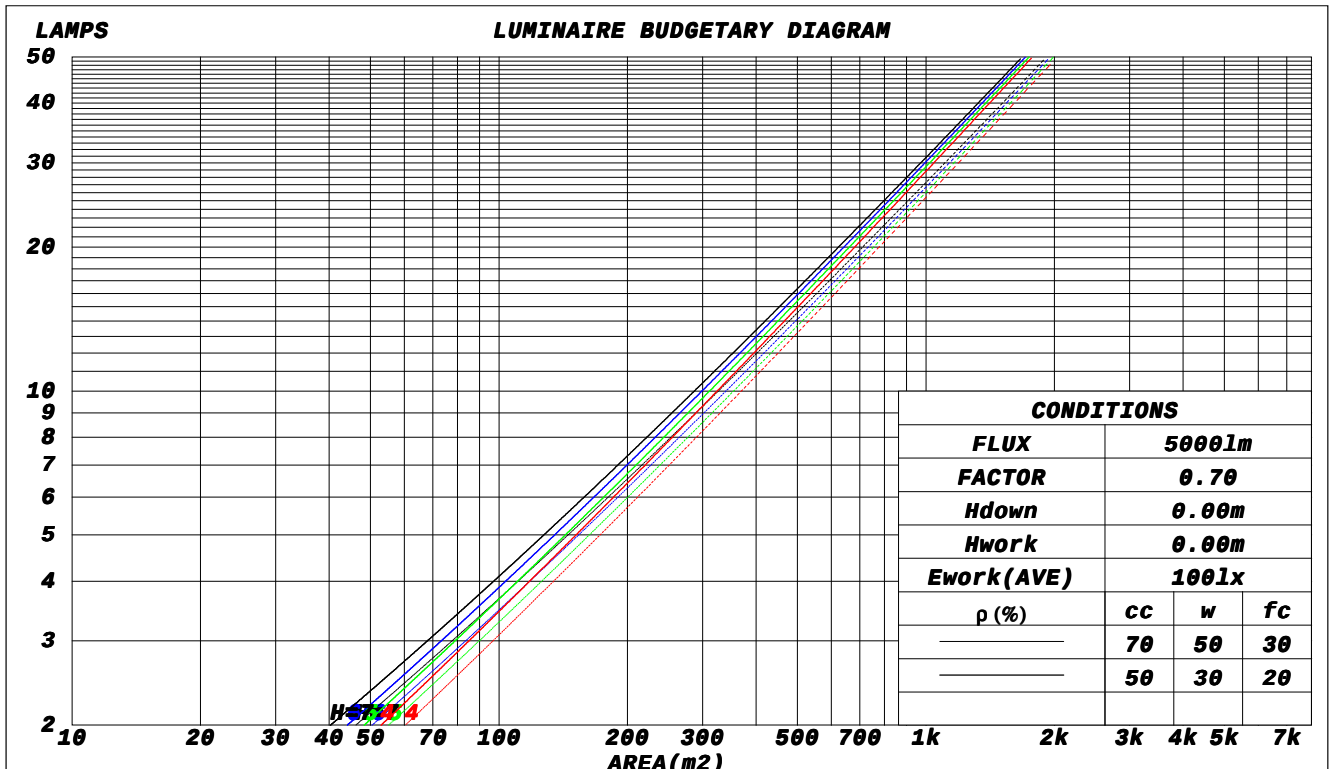
C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-11-07

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:0.0970A P:19.70W PF:0.9170 Lamp Flux:2287.92x1 lm		
NAME: PS-TL20W40KD3880RA-D	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	1.10	1.08	1.06	1.08	1.06	1.04	1.03	1.02	1.00	.99	.98	.97	.95	.94	.93	.91
2.0	1.03	.99	.96	1.01	.98	.95	.98	.95	.93	.94	.92	.90	.91	.89	.88	.86
3.0	.97	.93	.89	.96	.91	.88	.92	.89	.86	.90	.87	.84	.87	.85	.83	.81
4.0	.92	.87	.83	.90	.86	.82	.88	.84	.81	.85	.82	.79	.83	.80	.78	.77
5.0	.87	.81	.77	.86	.81	.77	.83	.79	.76	.81	.78	.75	.80	.77	.74	.73
6.0	.82	.77	.73	.81	.76	.72	.79	.75	.72	.78	.74	.71	.76	.73	.70	.69
7.0	.78	.73	.69	.77	.72	.69	.76	.71	.68	.74	.70	.67	.73	.69	.67	.66
8.0	.74	.69	.65	.74	.69	.65	.72	.68	.65	.71	.67	.64	.70	.66	.64	.62
9.0	.71	.66	.62	.70	.65	.62	.69	.65	.62	.68	.64	.61	.67	.63	.61	.60
10.0	.68	.63	.59	.67	.62	.59	.66	.62	.59	.65	.61	.58	.65	.61	.58	.57



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:0.0970A P:19.70W PF:0.9170 Lamp Flux:2287.92x1 lm											
NAME: PS-TL20W40KD3880RA-D						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	.169	.096	.030	.161	.092	.029	.147	.084	.027	.134	.077	.025	.121	.070	.023		
2.0	.160	.088	.027	.153	.084	.026	.141	.078	.024	.129	.073	.023	.119	.067	.021		
3.0	.151	.080	.024	.145	.078	.023	.134	.073	.022	.125	.068	.021	.116	.064	.020		
4.0	.142	.074	.022	.138	.072	.021	.128	.068	.020	.120	.064	.019	.112	.061	.019		
5.0	.135	.069	.020	.131	.067	.020	.123	.064	.019	.115	.061	.018	.108	.058	.017		
6.0	.128	.064	.018	.124	.063	.018	.117	.060	.017	.111	.057	.017	.104	.055	.016		
7.0	.122	.060	.017	.119	.059	.017	.112	.057	.016	.106	.055	.016	.101	.052	.015		
8.0	.117	.057	.016	.114	.056	.016	.108	.054	.015	.102	.052	.015	.097	.050	.015		
9.0	.112	.054	.015	.109	.053	.015	.104	.051	.015	.099	.049	.014	.094	.048	.014		
10.0	.107	.051	.014	.104	.050	.014	.100	.049	.014	.095	.047	.013	.091	.046	.013		

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	.197	.184	.172	.169	.158	.148	.115	.108	.102	.066	.063	.059	.021	.020	.019	
2.0	.181	.159	.141	.155	.137	.121	.106	.095	.085	.061	.055	.050	.020	.018	.016	
3.0	.168	.140	.118	.144	.121	.102	.099	.084	.072	.057	.049	.042	.018	.016	.014	
4.0	.157	.125	.101	.135	.108	.088	.093	.076	.062	.054	.044	.037	.017	.014	.012	
5.0	.148	.114	.088	.127	.098	.077	.088	.069	.054	.051	.040	.032	.016	.013	.011	
6.0	.140	.104	.078	.121	.090	.068	.083	.063	.048	.048	.037	.029	.016	.012	.009	
7.0	.133	.097	.071	.115	.084	.062	.079	.059	.044	.046	.035	.026	.015	.011	.009	
8.0	.128	.090	.065	.110	.078	.056	.076	.055	.040	.044	.032	.024	.014	.011	.008	
9.0	.122	.085	.060	.105	.074	.052	.073	.052	.037	.043	.031	.022	.014	.010	.007	
10.0	.118	.080	.056	.101	.070	.049	.070	.049	.035	.041	.029	.021	.013	.010	.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:0.0970A P:19.70W PF:0.9170 Lamp Flux:2287.92x1 lm										
NAME: PS-TL20W40KD3880RA-D					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	17.2	18.1	17.5	18.3	18.5	16.5	17.4	16.8	17.6	17.8
3H	17.2	18.0	17.5	18.2	18.5	16.5	17.3	16.8	17.5	17.8
4H	17.1	17.9	17.4	18.1	18.4	16.4	17.2	16.8	17.4	17.7
6H	17.0	17.7	17.4	18.0	18.3	16.4	17.0	16.7	17.3	17.6
8H	17.0	17.6	17.3	18.0	18.3	16.3	17.0	16.7	17.3	17.6
12H	16.9	17.6	17.3	17.9	18.2	16.3	16.9	16.6	17.2	17.6
4H 2H	17.1	17.8	17.4	18.1	18.4	16.4	17.2	16.8	17.4	17.7
3H	17.1	17.7	17.5	18.0	18.4	16.4	17.1	16.8	17.4	17.7
4H	17.0	17.6	17.4	17.9	18.3	16.4	16.9	16.8	17.3	17.7
6H	16.9	17.4	17.3	17.8	18.2	16.3	16.8	16.7	17.2	17.6
8H	16.9	17.3	17.3	17.7	18.2	16.2	16.7	16.7	17.1	17.5
12H	16.8	17.2	17.3	17.7	18.1	16.2	16.6	16.6	17.0	17.5
8H 4H	16.9	17.3	17.3	17.7	18.2	16.2	16.7	16.7	17.1	17.5
6H	16.8	17.2	17.2	17.6	18.1	16.1	16.5	16.6	17.0	17.5
8H	16.7	17.1	17.2	17.5	18.0	16.1	16.4	16.6	16.9	17.4
12H	16.7	17.0	17.2	17.5	18.0	16.0	16.3	16.6	16.8	17.4
12H 4H	16.8	17.2	17.3	17.7	18.1	16.2	16.6	16.6	17.0	17.5
6H	16.7	17.0	17.2	17.5	18.0	16.1	16.4	16.6	16.9	17.4
8H	16.7	16.9	17.2	17.4	18.0	16.0	16.3	16.5	16.8	17.4
Variations with the observer position at spacings:										
S = 1.0H	+ 2.4 / - 4.2					+ 2.0 / - 3.9				
1.5H	+ 3.7 / - 3.0					+ 3.2 / - 2.8				
2.0H	+ 3.4 / - 2.9					+ 3.2 / - 2.8				

CIE Pub.117 Corrected 2288 lm Total Lamp Luminous Flux. (8log(F/F0) = 2.9)

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:

UTILIZATION FACTORS TABLE

Test:U:221.1V I:0.0970A P:19.70W PF:0.9170 Lamp Flux:2287.92x1 lm		
NAME: PS-TL20W40KD3880RA-D	TYPE: LED	
MFR.:		

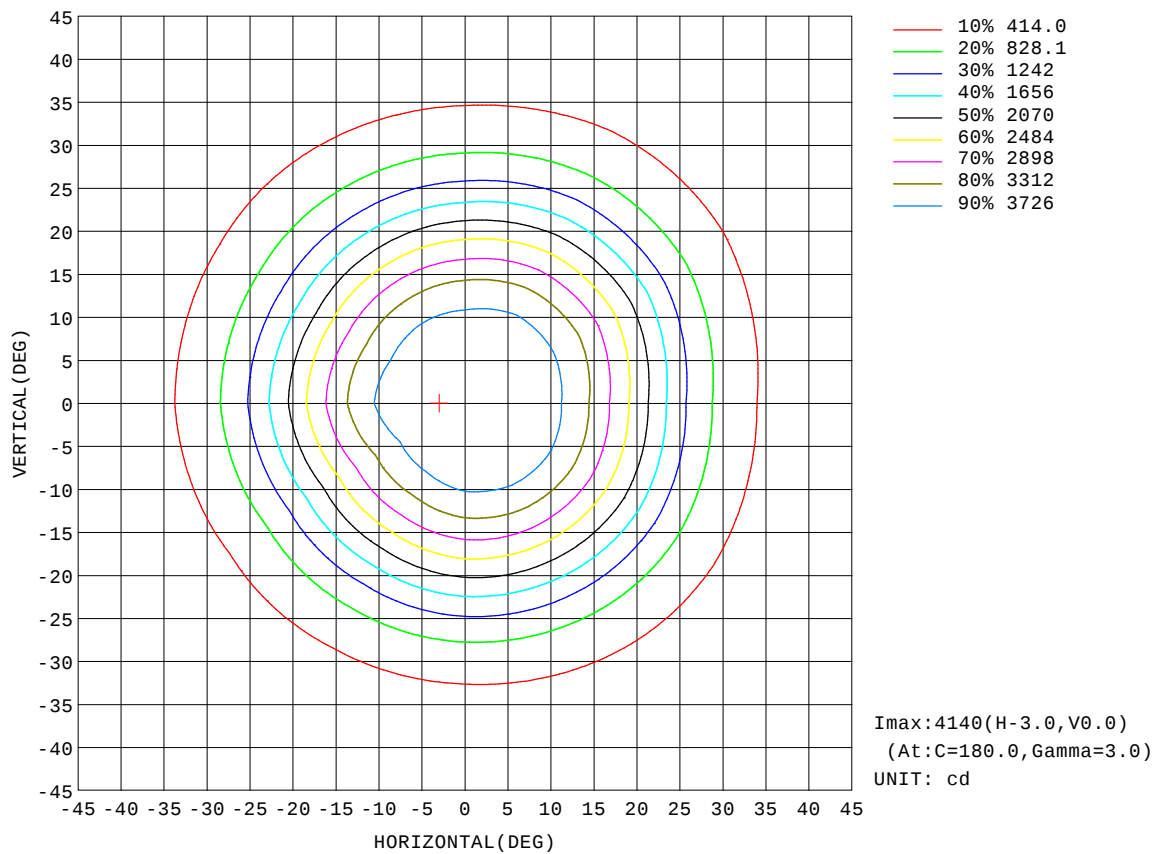
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	85	79	75	85	79	75	84	78	75	71
0.80	93	87	83	92	86	83	91	86	82	78
1.00	97	92	88	96	91	88	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	103	94
5.00	114	112	110	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:0.0970A P:19.70W PF:0.9170 Lamp Flux:2287.92x1 lm		
NAME: PS-TL20W40KD3880RA-D	TYPE: LED	
MFR.:		



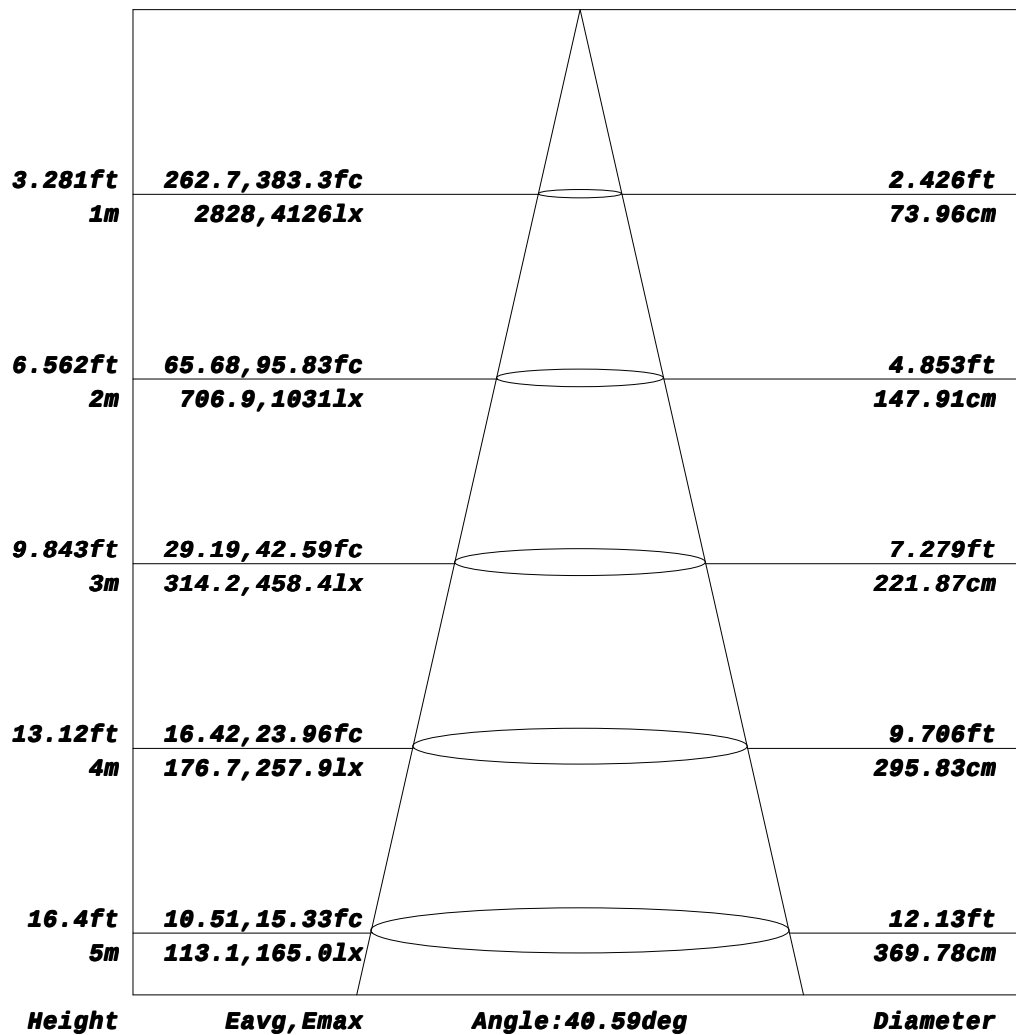
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-11-07

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:0.0970A P:19.70W PF:0.9170 Lamp Flux:2287.92x1 lm		
NAME: PS-TL20W40KD3880RA-D	TYPE: LED	
MFR.:		

Flux out:1309 lm



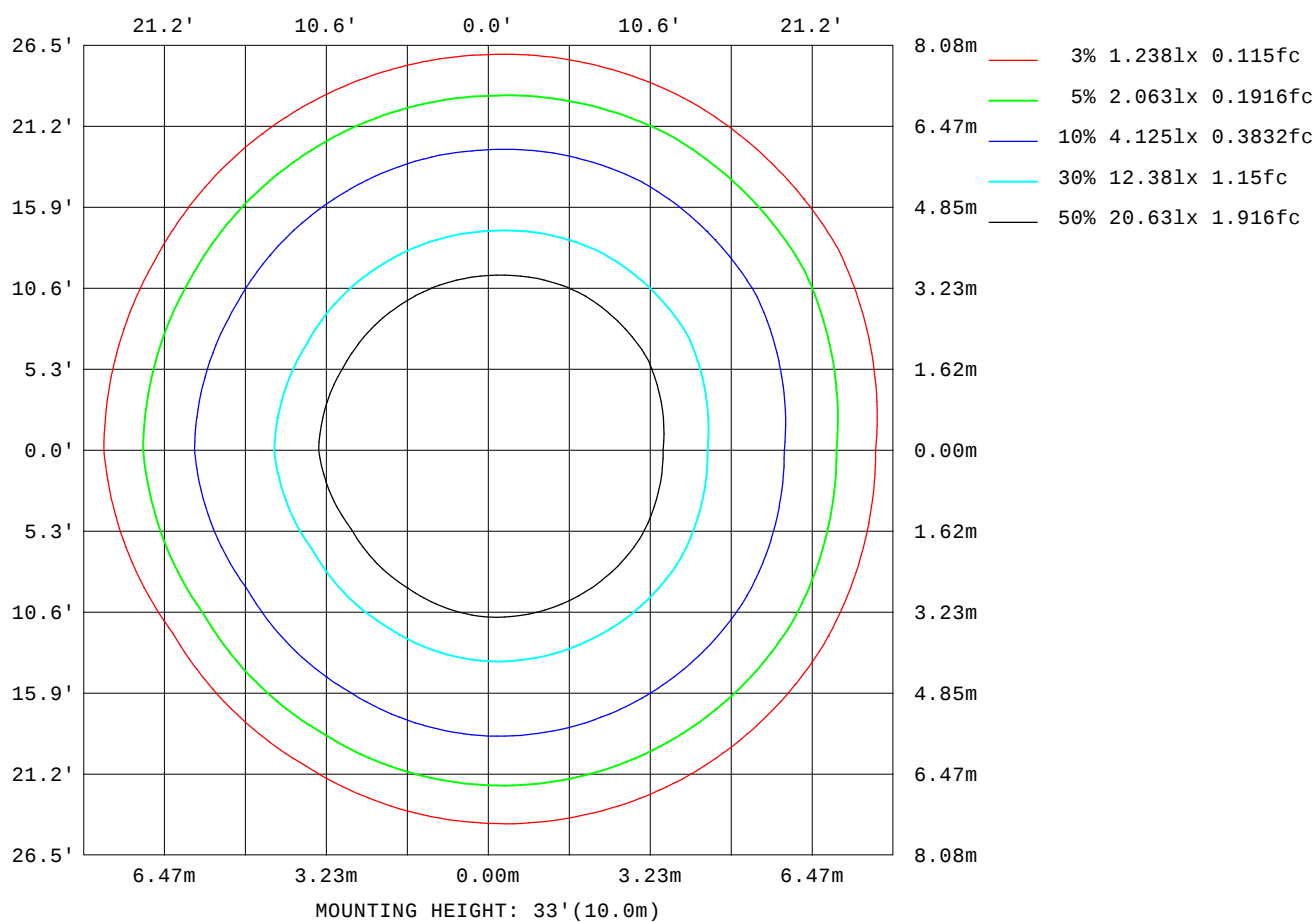
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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

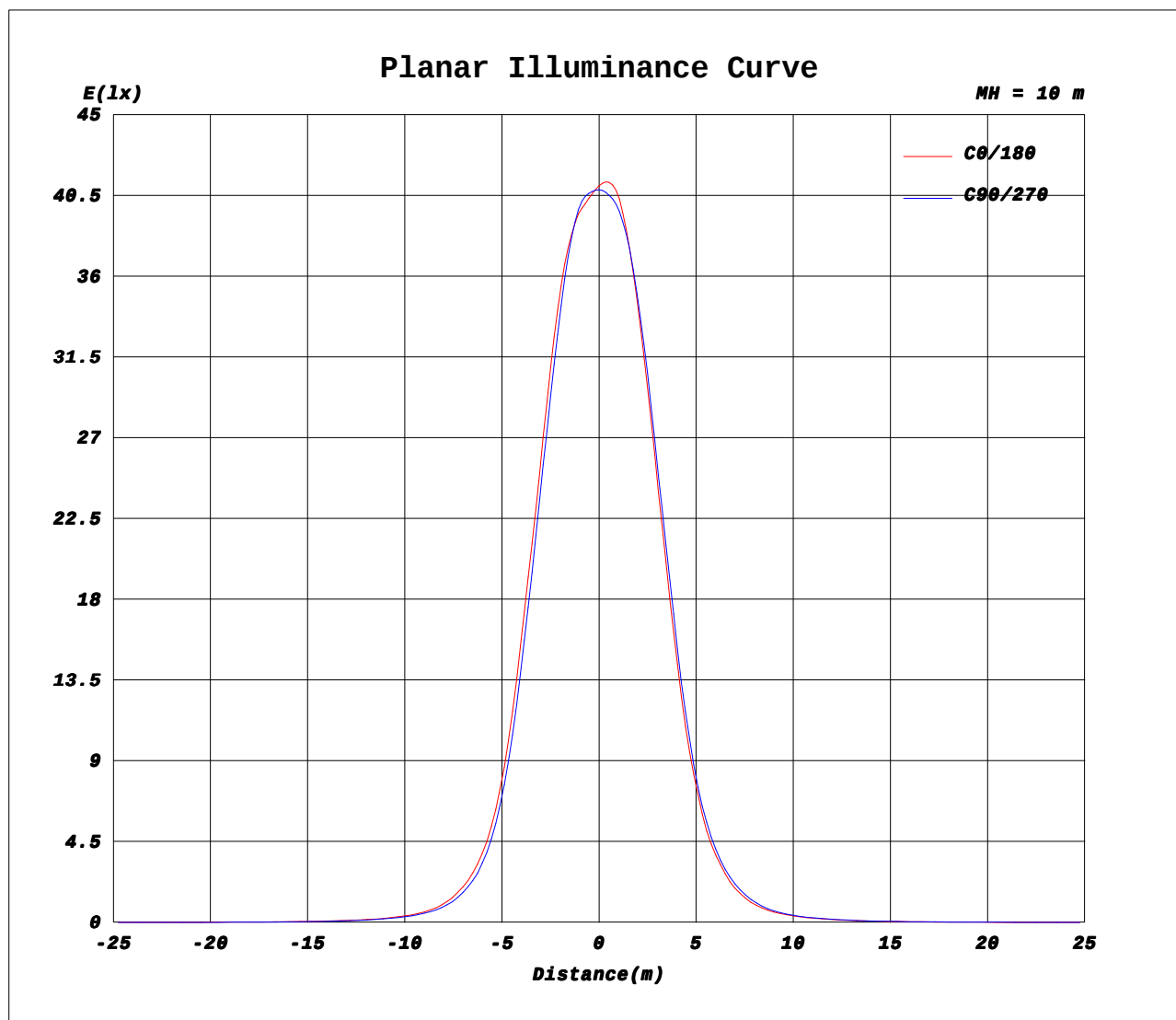
Test:U:221.1V I:0.0970A P:19.70W PF:0.9170 Lamp Flux:2287.92x1 lm		
NAME: PS-TL20W40KD3880RA-D	TYPE: LED	
MFR.:		



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:0.0970A P:19.70W PF:0.9170 Lamp Flux:2287.92x1 lm											
NAME: PS-TL20W40KD3880RA-D						TYPE: LED					
MFR.:											

Table--1

UNIT: cd

γ (DEG)	C (DEG)																			
	0	30	60	90	120	150	180	210	240	270	300	330								
0	4104	4096	4087	4083	4076	4064	4104	4096	4087	4083	4076	4064								
5	4026	4020	4039	4065	4055	4034	4128	4087	4071	4049	4036	4000								
10	3842	3848	3821	3757	3622	3582	3789	3724	3780	3807	3876	3866								
15	3217	3239	3152	3039	2885	2841	3111	3050	3116	3196	3342	3373								
20	2317	2328	2219	2117	1952	1897	2171	2098	2184	2299	2478	2515								
25	1363	1394	1296	1208	1090	1067	1278	1223	1272	1377	1534	1593								
30	696	710	653	602	540	549	676	650	686	736	819	840								
35	364	368	338	306	269	273	349	342	362	392	439	439								
40	182	187	172	157	140	142	181	180	191	203	221	226								
45	103	106	99.3	90.9	81.8	83.2	105	104	111	114	124	123								
50	62.6	64.6	60.9	55.6	50.5	51.6	64.4	63.5	67.6	69.0	74.4	73.8								
55	38.0	39.0	36.8	34.0	31.0	31.6	39.6	39.7	42.0	42.8	45.3	44.8								
60	23.9	24.5	23.3	21.6	19.9	20.2	25.8	25.9	27.0	27.5	28.9	28.5								
65	15.3	15.7	15.0	14.0	12.8	12.8	17.4	17.5	17.9	18.3	19.1	19.2								
70	7.73	8.19	7.85	7.30	6.34	6.09	10.0	9.95	10.5	10.9	11.3	11.3								
75	2.07	2.94	2.80	2.36	1.63	1.51	5.56	5.23	5.76	5.98	6.69	6.39								
80	1.02	1.08	1.09	1.08	1.00	0.95	4.32	4.30	4.25	4.20	4.15	4.12								
85	1.02	1.02	1.05	1.07	1.11	1.11	4.60	4.58	4.50	4.41	4.30	4.28								
90	1.34	1.34	1.39	1.44	1.51	1.50	5.00	4.99	4.90	4.83	4.73	4.72								
95	1.91	1.90	1.99	2.07	2.20	2.18	5.41	5.39	5.31	5.23	5.14	5.14								
100	2.78	2.78	2.90	3.04	3.22	3.21	5.86	5.85	5.74	5.67	5.57	5.57								
105	4.05	4.03	4.22	4.41	4.66	4.64	6.47	6.46	6.34	6.24	6.12	6.10								
110	5.67	5.68	5.89	6.14	6.40	6.40	7.25	7.24	7.11	6.98	6.82	6.81								
115	7.60	7.62	7.84	8.12	8.41	8.42	8.23	8.25	8.10	7.93	7.73	7.71								
120	9.75	9.75	9.98	10.3	10.6	10.6	9.57	9.57	9.34	9.15	8.92	8.89								
125	12.1	12.1	12.3	12.6	12.9	12.9	11.3	11.3	11.0	10.8	10.5	10.4								
130	14.6	14.5	14.8	15.0	15.4	15.4	13.4	13.4	13.1	12.8	12.4	12.3								
135	17.2	17.1	17.3	17.5	17.9	18.0	15.9	15.9	15.5	15.1	14.7	14.7								
140	19.9	19.8	19.9	19.9	20.5	20.7	18.7	18.7	18.2	17.7	17.4	17.3								
145	22.8	22.6	22.5	22.4	23.0	23.5	21.8	21.7	21.1	20.8	20.2	20.2								
150	25.7	25.5	25.2	25.1	25.6	26.3	25.0	24.8	23.9	23.3	23.1	23.3								
155	28.5	28.2	27.6	27.6	27.9	28.6	27.9	27.5	26.6	26.0	25.8	26.2								
160	30.7	30.3	29.6	29.5	29.6	30.1	30.1	29.4	28.6	28.1	28.0	28.4								
165	31.8	31.3	30.6	30.4	30.3	30.4	31.1	30.0	29.6	29.1	29.1	29.6								
170	32.2	31.6	30.9	30.6	30.4	30.5	31.4	30.2	29.8	29.3	29.5	30.0								
175	32.9	32.2	31.3	31.0	30.9	31.2	32.1	30.9	30.3	29.8	29.9	30.5								
180	33.3	32.4	31.6	31.2	31.1	31.7	33.4	32.3	31.7	31.2	31.2	31.6								

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: