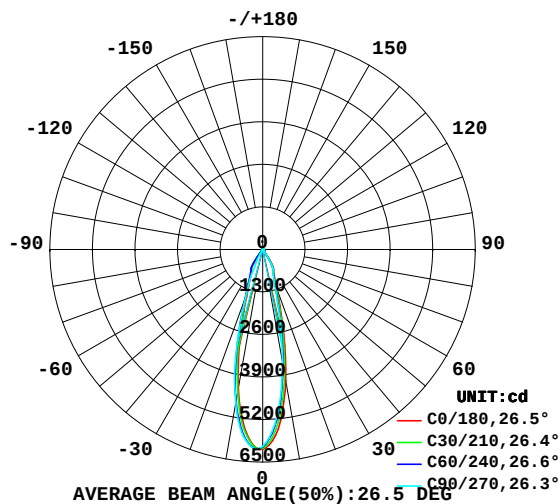


LUMINAIRE PHOTOMETRIC TEST REPORT

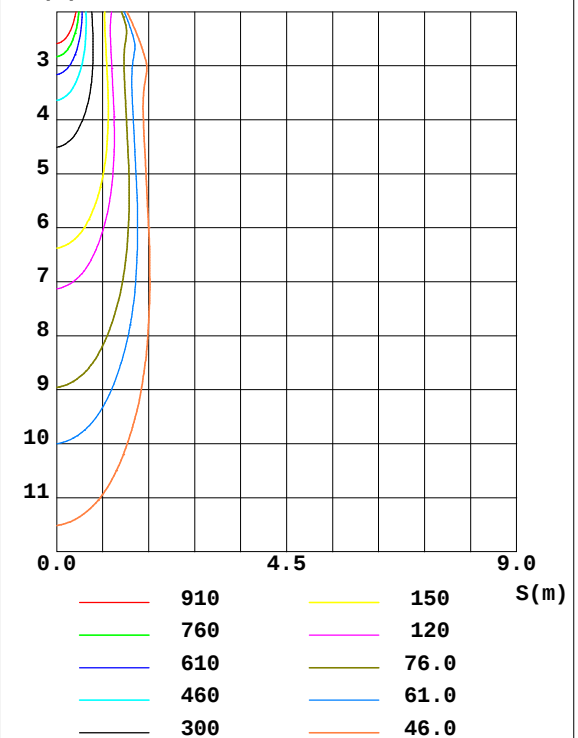
Test:U:220.9V I:0.1000A P:20.60W PF:0.9280 Lamp Flux:1867.54x1 lm		
NAME: PS-TL-20W-RA90	TYPE: LED	
MFR.:		

DATA OF LAMP		PHOTOMETRIC DATA				Eff: 90.66 lm/W
MODEL	PS-TL-20W-RA90	I _{max} (cd)	6104	S/MH(C0/180)		0.44
NOMINAL POWER(W)	20	LOR(%)	100.0	S/MH(C90/270)		0.39
RATED VOLTAGE(V)	220	TOTAL FLUX(lm)	1867.5	η UP, DN(C0-180)		1.6, 42.2
NOMINAL FLUX(lm)	1867.54	CIE CLASS	DIRECT	η UP, DN(C180-360)		1.7, 54.5
LAMPS INSIDE	1	η up(%)	3.3	CIBSE SHR NOM		0.00
TEST VOLTAGE(V)	220.9	η down(%)	96.7	CIBSE SHR MAX		1.00

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



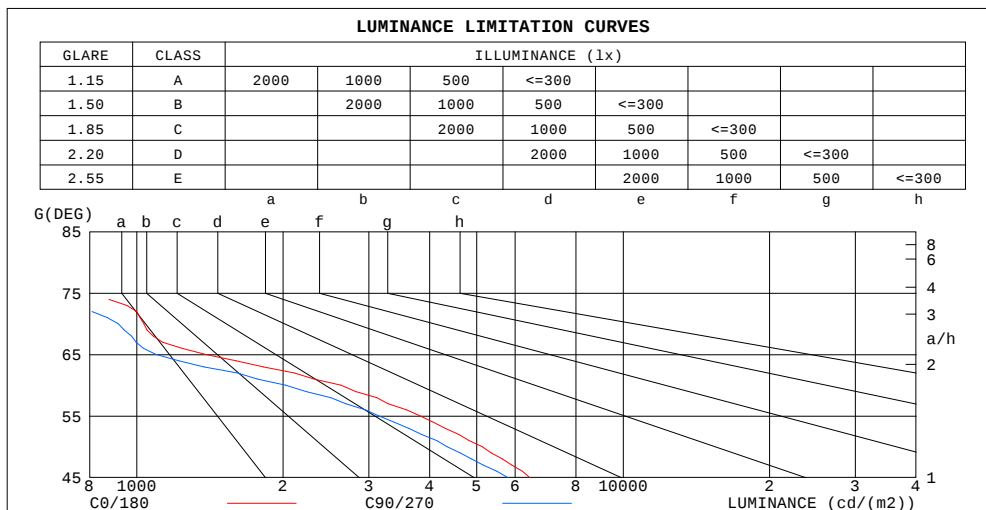
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-24

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	4062	3727	3504	3451	4310	4567	4763	4824	0- 10	481.9	481.9	25.8,25.8
20	1260	1141	1056	1044	1358	1515	1523	1656	10- 20	688.0	1170	62.6,62.6
30	660.9	610.8	569.4	562.5	691.2	707.5	206.1	714.4	20- 30	396.5	1566	83.9,83.9
40	51.25	47.80	44.35	45.38	53.39	77.56	30.88	94.42	30- 40	181.4	1748	93.6,93.6
50	29.69	26.77	25.12	25.38	31.69	34.17	13.91	36.18	40- 50	30.60	1778	95.2,95.2
60	11.84	9.931	9.105	8.974	13.99	14.88	4.532	15.21	50- 60	17.29	1796	96.2,96.2
70	3.184	3.015	2.819	2.774	5.159	5.143	2.128	4.906	60- 70	6.402	1802	96.5,96.5
80	0.5049	0.5675	0.5736	0.5604	2.975	2.831	2.677	2.781	70- 80	2.603	1805	96.6,96.6
90	0.6711	0.7432	0.7258	0.7617	3.601	3.483	3.431	3.480	80- 90	2.060	1807	96.7,96.7
100	1.430	1.501	1.457	1.550	4.112	4.039	4.005	4.026	90-100	2.642	1809	96.9,96.9
110	3.088	3.196	3.179	3.315	5.146	4.966	4.830	4.845	100-110	3.510	1813	97.1,97.1
120	6.082	6.333	6.371	6.534	7.302	7.073	6.851	6.875	110-120	5.222	1818	97.4,97.4
130	10.57	10.85	10.86	11.10	10.36	9.983	9.684	9.711	120-130	7.552	1826	97.8,97.8
140	15.86	16.08	15.92	16.31	14.75	14.16	13.72	13.78	130-140	9.738	1835	98.3,98.3
150	21.26	21.48	21.43	21.63	20.55	19.75	19.03	19.23	140-150	11.09	1847	98.9,98.9
160	26.43	26.77	26.61	26.58	25.63	24.70	23.88	24.44	150-160	10.66	1857	99.4,99.4
170	29.36	29.01	28.58	28.71	28.28	27.17	26.73	27.18	160-170	7.679	1865	99.9,99.9
180	29.27	28.14	27.80	28.34	29.35	28.15	27.75	28.35	170-180	2.679	1868	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



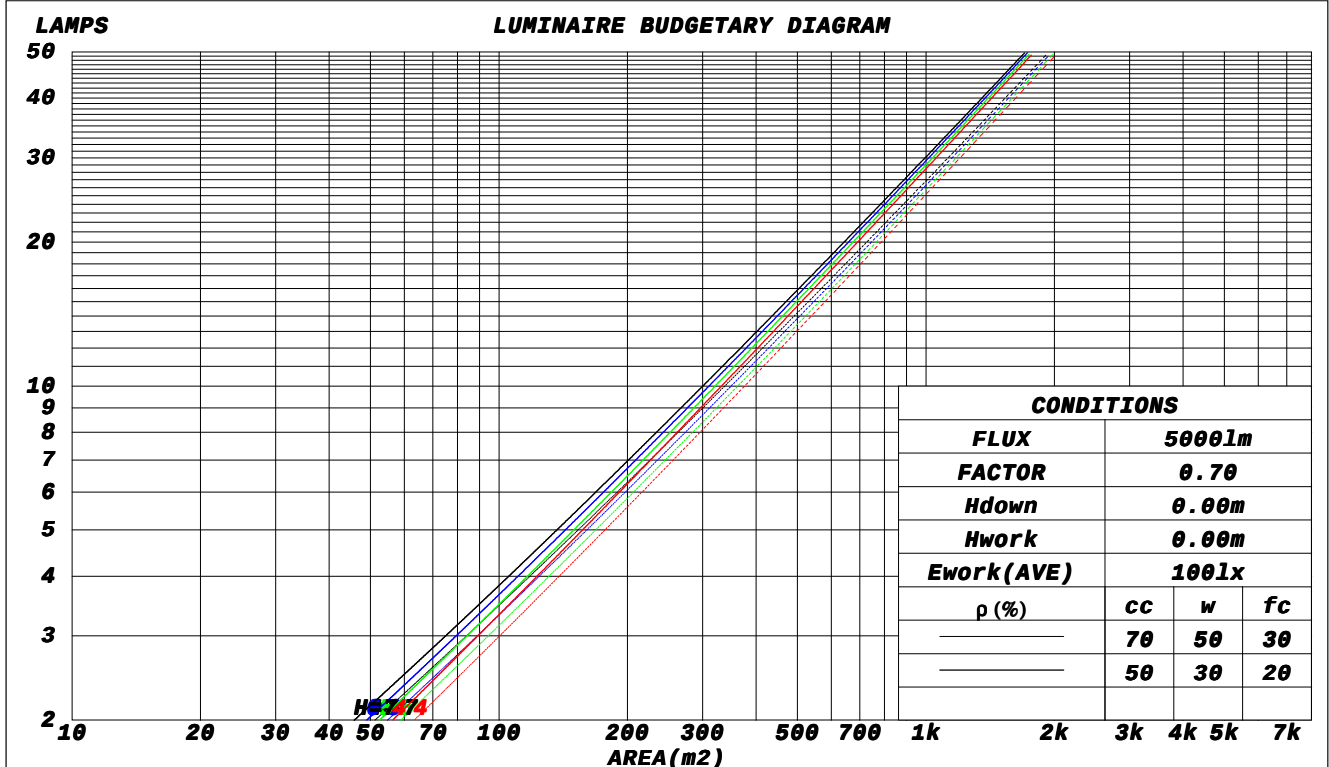
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-24

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:220.9V I:0.1000A P:20.60W PF:0.9280 Lamp Flux:1867.54x1 lm		
NAME: PS-TL-20W-RA90	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															



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2017-03-24

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:0.1000A P:20.60W PF:0.9280 Lamp Flux:1867.54x1 lm											
NAME: PS-TL-20W-RA90						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	.156	.089	.028	.149	.085	.027	.134	.077	.025	.121	.070	.022	.109	.063	.020		
2.0	.147	.080	.025	.140	.077	.024	.128	.071	.022	.117	.066	.021	.107	.060	.019		
3.0	.138	.073	.022	.132	.071	.021	.122	.066	.020	.112	.061	.019	.103	.057	.018		
4.0	.130	.067	.020	.125	.065	.019	.116	.061	.018	.108	.058	.017	.100	.054	.017		
5.0	.123	.062	.018	.118	.061	.018	.111	.058	.017	.103	.055	.016	.097	.052	.016		
6.0	.116	.058	.017	.113	.057	.016	.106	.054	.016	.099	.052	.015	.093	.049	.015		
7.0	.111	.055	.016	.107	.054	.015	.101	.051	.015	.096	.049	.014	.090	.047	.014		
8.0	.106	.052	.014	.103	.051	.014	.097	.049	.014	.092	.047	.013	.087	.045	.013		
9.0	.101	.049	.014	.098	.048	.013	.093	.046	.013	.089	.044	.013	.084	.043	.012		
10.0	.097	.046	.013	.094	.046	.013	.090	.044	.012	.086	.043	.012	.082	.041	.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	.126	.126	.126	.072	.072	.072	.023	.023	.023	
1.0	.195	.182	.171	.167	.157	.148	.114	.108	.102	.066	.062	.059	.021	.020	.019	
2.0	.178	.158	.141	.152	.136	.122	.104	.094	.085	.060	.055	.050	.019	.018	.016	
3.0	.164	.139	.118	.141	.120	.103	.097	.083	.072	.056	.049	.042	.018	.016	.014	
4.0	.153	.124	.102	.131	.107	.088	.090	.075	.062	.052	.044	.037	.017	.014	.012	
5.0	.143	.112	.089	.123	.097	.077	.085	.068	.054	.049	.040	.032	.016	.013	.011	
6.0	.135	.102	.079	.116	.088	.069	.080	.062	.049	.046	.036	.029	.015	.012	.010	
7.0	.128	.094	.071	.110	.082	.062	.076	.057	.044	.044	.034	.026	.014	.011	.009	
8.0	.122	.088	.065	.105	.076	.056	.072	.053	.040	.042	.032	.024	.014	.010	.008	
9.0	.116	.082	.060	.100	.072	.052	.069	.050	.037	.040	.030	.022	.013	.010	.007	
10.0	.111	.078	.055	.096	.068	.048	.067	.048	.034	.039	.028	.021	.013	.009	.007	

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-24

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:0.1000A P:20.60W PF:0.9280 Lamp Flux:1867.54x1 lm										
NAME: PS-TL-20W-RA90					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	13.8	14.6	14.1	14.8	15.0	12.0	12.7	12.3	13.0	13.2
3H	13.7	14.4	14.0	14.7	14.9	11.9	12.6	12.2	12.8	13.1
4H	13.6	14.3	14.0	14.6	14.8	11.8	12.5	12.1	12.7	13.0
6H	13.5	14.2	13.9	14.5	14.8	11.7	12.3	12.0	12.6	12.9
8H	13.5	14.1	13.9	14.4	14.7	11.7	12.3	12.0	12.6	12.9
12H	13.5	14.0	13.8	14.3	14.7	11.6	12.2	12.0	12.5	12.8
4H 2H	13.6	14.3	13.9	14.6	14.8	11.8	12.5	12.1	12.7	13.0
3H	13.5	14.1	13.9	14.4	14.7	11.7	12.3	12.1	12.6	12.9
4H	13.4	13.9	13.8	14.3	14.6	11.6	12.1	12.0	12.5	12.8
6H	13.3	13.8	13.7	14.2	14.6	11.5	12.0	11.9	12.4	12.8
8H	13.3	13.7	13.7	14.1	14.5	11.5	11.9	11.9	12.3	12.7
12H	13.2	13.6	13.7	14.0	14.5	11.4	11.8	11.9	12.2	12.7
8H 4H	13.2	13.7	13.7	14.1	14.5	11.5	11.9	11.9	12.3	12.7
6H	13.1	13.5	13.6	13.9	14.4	11.3	11.7	11.8	12.1	12.6
8H	13.1	13.4	13.6	13.9	14.4	11.3	11.6	11.8	12.1	12.6
12H	13.0	13.3	13.5	13.8	14.3	11.3	11.5	11.8	12.0	12.6
12H 4H	13.2	13.6	13.7	14.0	14.5	11.4	11.8	11.9	12.2	12.7
6H	13.1	13.4	13.6	13.9	14.4	11.3	11.6	11.8	12.1	12.6
8H	13.0	13.3	13.5	13.8	14.3	11.2	11.5	11.8	12.0	12.5
Variations with the observer position at spacings:										
S = 1.0H	+ 3.8 / - 2.8					+ 1.3 / - 2.2				
1.5H	+ 4.9 / - 1.8					+ 0.8 / - 1.1				
2.0H	+ 2.7 / - 4.7					+ 2.9 / - 4.5				

CIE Pub.117 Corrected 1868 lm Total Lamp Luminous Flux. (8log(F/F0) = 2.2)

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-24

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:220.9V I:0.1000A P:20.60W PF:0.9280 Lamp Flux:1867.54x1 lm		
NAME: PS-TL-20W-RA90	TYPE: LED	
MFR.:		

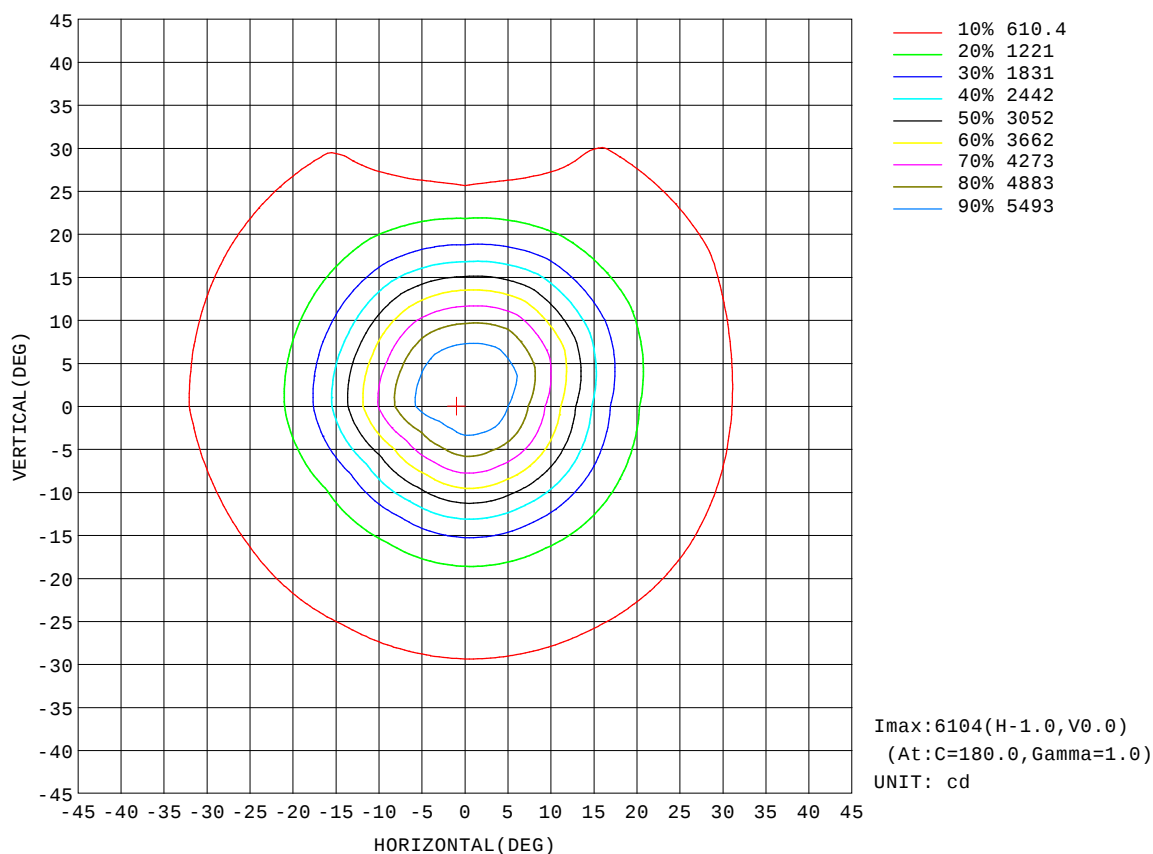
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	88	81	78	87	81	78	86	81	77	74
0.80	95	89	86	94	89	85	93	88	85	81
1.00	99	93	90	98	93	90	96	92	89	85
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	110	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: 2017-03-24

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:0.1000A P:20.60W PF:0.9280 Lamp Flux:1867.54x1 lm		
NAME: PS-TL-20W-RA90	TYPE: LED	
MFR.:		

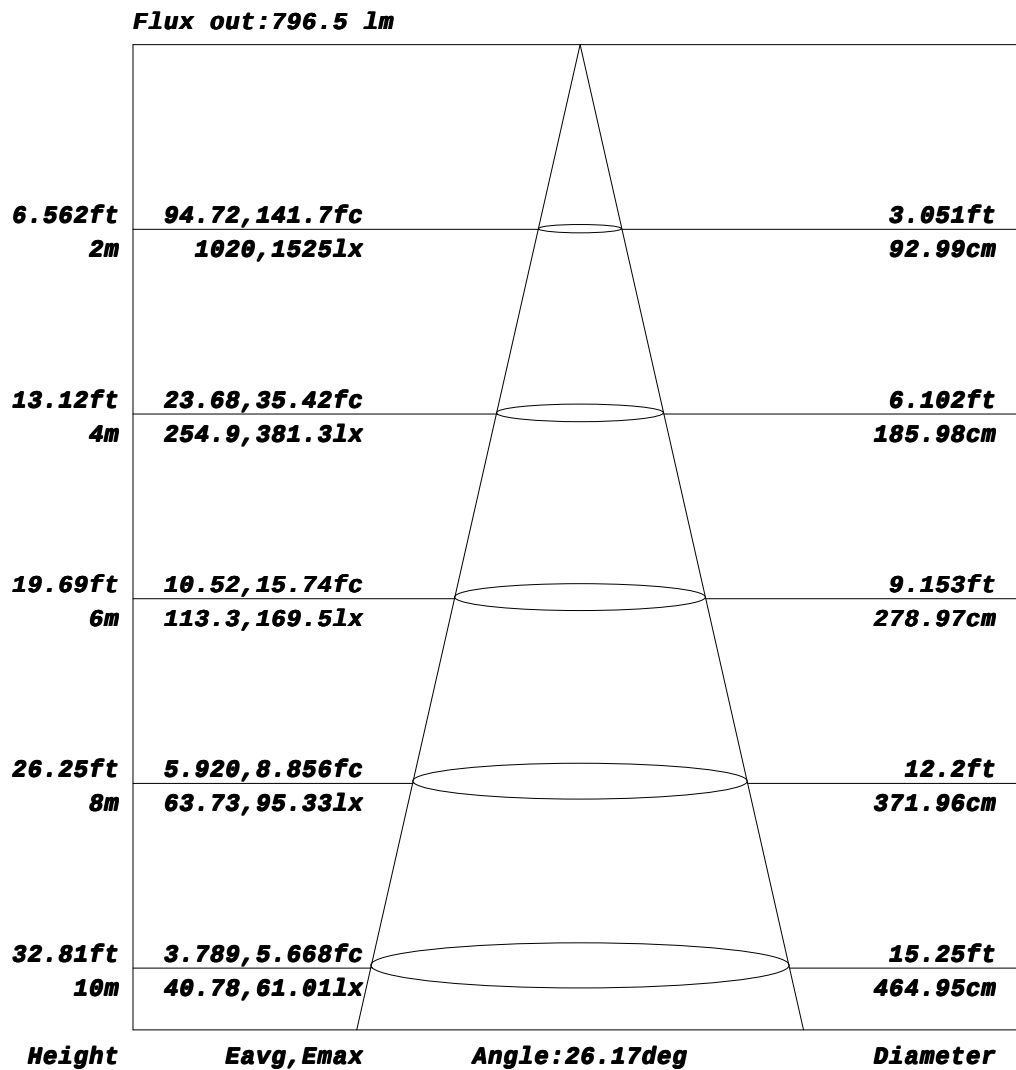


C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2017-03-24

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:0.1000A P:20.60W PF:0.9280 Lamp Flux:1867.54x1 lm		
NAME: PS-TL-20W-RA90	TYPE: LED	
MFR.:		



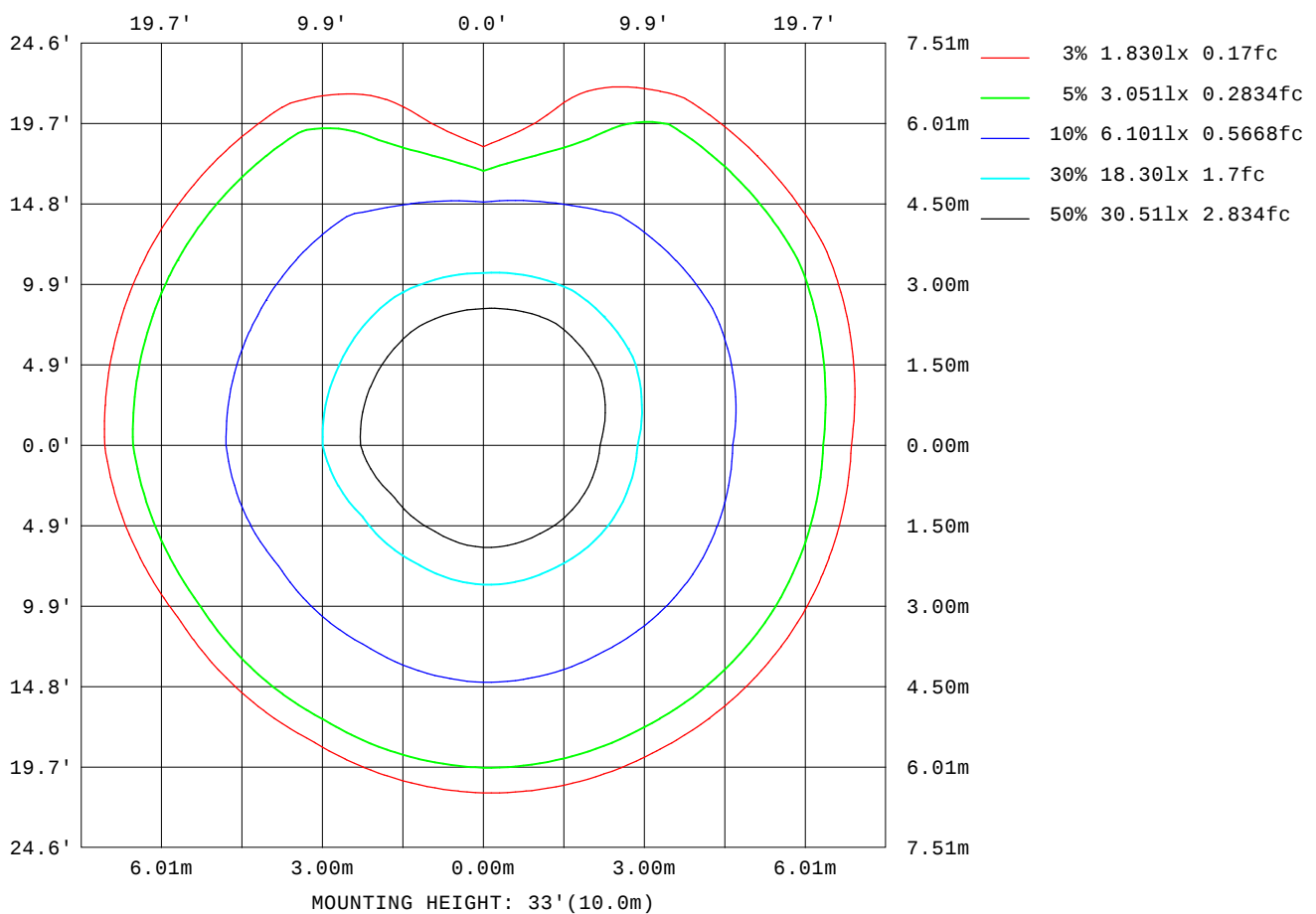
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-24

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

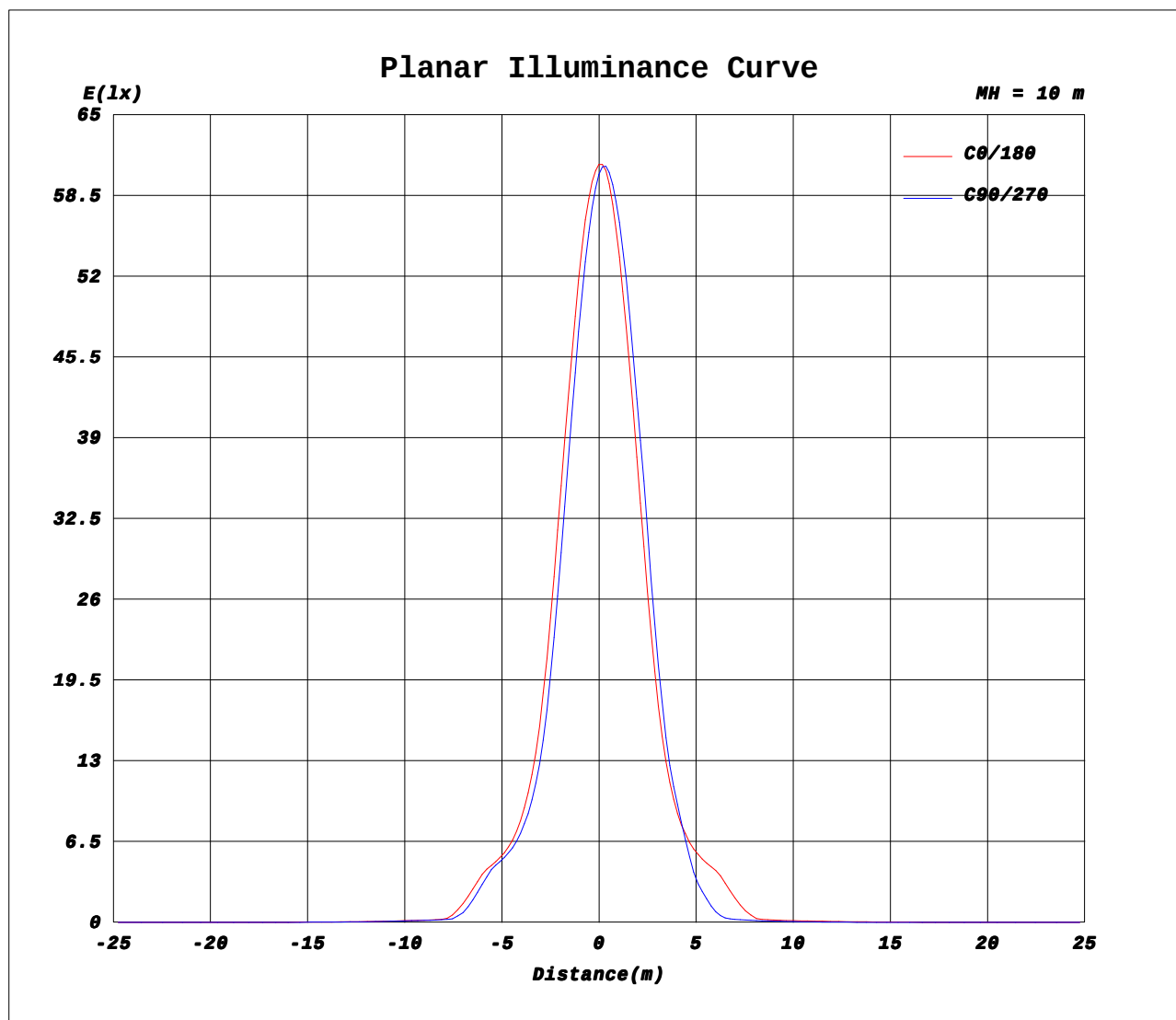
Test:U:220.9V I:0.1000A P:20.60W PF:0.9280 Lamp Flux:1867.54x1 lm		
NAME: PS-TL-20W-RA90	TYPE: LED	
MFR.:		



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-24

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: 2017-03-24

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:0.1000A P:20.60W PF:0.9280 Lamp Flux:1867.54x1 lm																	
NAME: PS-TL-20W-RA90									TYPE: LED								
MFR.:																	

Table--1

UNIT: cd

γ (DEG)	C (DEG)																	
	0	30	60	90	120	150	180	210	240	270	300	330						
0	6099	6076	6033	6020	5986	5999	6099	6076	6033	6020	5986	5999						
5	5498	5354	5174	5111	5020	5129	5647	5706	5846	5873	5927	5822						
10	4062	3853	3601	3504	3364	3537	4310	4421	4713	4763	4956	4693						
15	2358	2199	1974	1899	1803	1934	2598	2729	3051	3073	3317	3036						
20	1260	1185	1097	1056	1020	1069	1358	1436	1593	1523	1713	1600						
25	816	798	760	752	732	755	866	895	950	712	966	953						
30	661	636	585	569	536	589	691	699	716	206	715	714						
35	280	230	169	143	108	154	359	415	465	45.4	525	479						
40	51.3	48.7	46.9	44.4	45.2	45.6	53.4	62.9	92.2	30.9	110	78.5						
45	40.9	38.6	37.1	36.9	37.6	37.7	42.0	44.7	44.8	22.8	43.2	47.8						
50	29.7	27.7	25.9	25.1	24.9	25.9	31.7	34.1	34.3	13.9	34.4	38.0						
55	19.7	18.3	16.9	16.2	15.8	16.6	22.1	23.5	22.9	8.60	22.7	25.0						
60	11.8	10.3	9.52	9.11	8.70	9.25	14.0	15.0	14.7	4.53	14.3	16.1						
65	5.27	4.78	4.45	4.17	4.01	4.29	7.59	8.36	7.98	2.79	8.19	8.70						
70	3.18	3.07	2.96	2.82	2.73	2.82	5.16	5.40	4.89	2.13	4.75	5.06						
75	1.28	1.65	0.62	0.61	0.59	0.53	4.15	4.38	3.04	2.24	4.05	4.33						
80	0.50	0.55	0.59	0.57	0.58	0.54	2.98	2.88	2.78	2.68	2.72	2.84						
85	0.54	0.60	0.61	0.60	0.60	0.61	3.30	3.23	3.11	3.08	3.10	3.20						
90	0.67	0.74	0.75	0.73	0.75	0.77	3.60	3.54	3.42	3.43	3.44	3.52						
95	0.96	1.03	1.04	0.99	1.05	1.08	3.89	3.84	3.75	3.76	3.76	3.82						
100	1.43	1.49	1.52	1.46	1.53	1.56	4.11	4.07	4.01	4.00	4.01	4.04						
105	2.13	2.18	2.21	2.13	2.24	2.31	4.48	4.41	4.30	4.29	4.27	4.33						
110	3.09	3.18	3.21	3.18	3.30	3.34	5.15	5.04	4.89	4.83	4.79	4.90						
115	4.39	4.54	4.59	4.59	4.74	4.73	6.17	6.01	5.78	5.71	5.65	5.82						
120	6.08	6.29	6.37	6.37	6.56	6.51	7.30	7.19	6.95	6.85	6.77	6.98						
125	8.14	8.40	8.49	8.49	8.71	8.65	8.68	8.54	8.27	8.16	8.07	8.30						
130	10.6	10.8	10.9	10.9	11.1	11.1	10.4	10.1	9.83	9.68	9.58	9.84						
135	13.1	13.4	13.4	13.3	13.6	13.6	12.3	12.0	11.7	11.5	11.4	11.7						
140	15.9	16.1	16.0	15.9	16.2	16.4	14.7	14.4	13.9	13.7	13.6	14.0						
145	18.6	18.8	18.7	18.6	18.9	19.0	17.6	17.1	16.5	16.2	16.1	16.5						
150	21.3	21.5	21.5	21.4	21.6	21.7	20.6	20.0	19.5	19.0	19.0	19.4						
155	23.9	24.1	24.3	24.2	24.1	24.3	23.3	22.8	22.2	21.7	21.9	22.4						
160	26.4	26.7	26.8	26.6	26.5	26.7	25.6	25.0	24.4	23.9	24.1	24.7						
165	28.6	28.8	28.6	28.3	28.3	28.4	27.4	26.7	26.0	25.6	25.8	26.5						
170	29.4	29.3	28.7	28.6	28.6	28.8	28.3	27.4	27.0	26.7	26.9	27.4						
175	29.3	28.8	28.3	28.2	28.3	28.7	28.3	27.4	27.0	26.9	27.2	27.6						
180	29.3	28.4	27.9	27.8	28.1	28.6	29.3	28.4	27.9	27.7	28.1	28.6						

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-03-24

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: