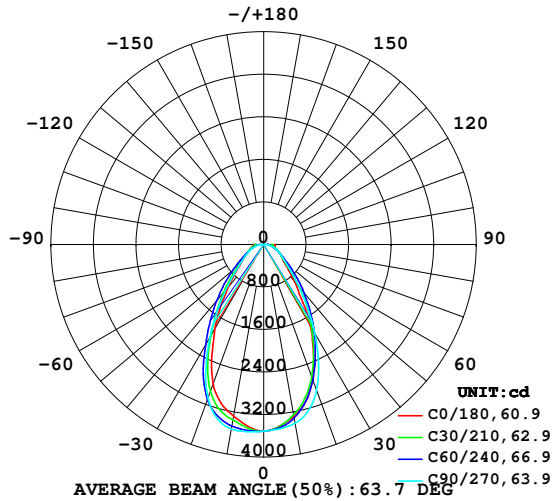


LUMINAIRE PHOTOMETRIC TEST REPORT

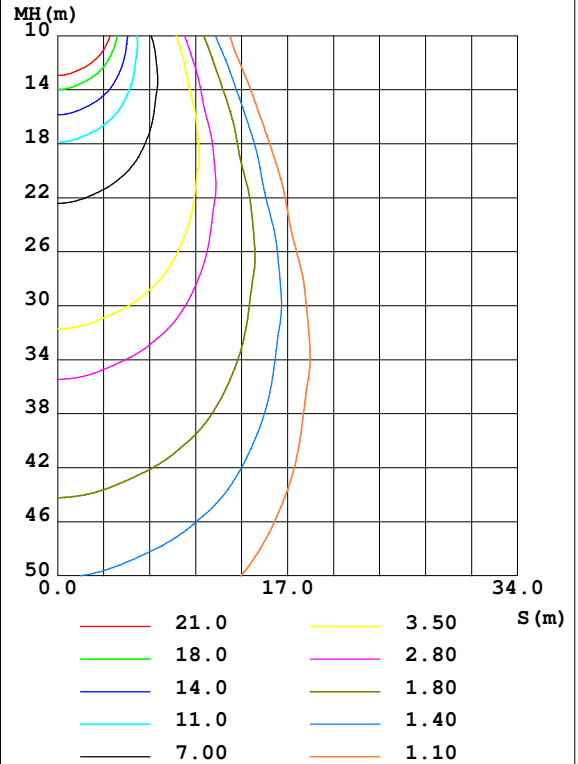
Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 116.57 lm/W			
MODEL	TCA	I _{max} (cd)	3539	S/MH (C0/180)	0.92
NOMINAL POWER (W)	45W	LOR (%)	100.0	S/MH (C90/270)	0.98
RATED VOLTAGE (V)	220.0	TOTAL FLUX (lm)	4986.2	η UP, DN (C0-180)	0.0, 48.6
NOMINAL FLUX (lm)	4986.19	CIE CLASS	DIRECT	η UP, DN (C180-360)	0.0, 51.4
LAMPS INSIDE	1	η up (%)	0.0	CIBSE SHR NOM	1.00
TEST VOLTAGE (V)	220	η down (%)	100.0	CIBSE SHR MAX	1.05

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



C Range: 0 - 360DEG
 C Interval: 10.0DEG
 Test Speed: HIGH
 Temperature: 20DEG
 Operators: LITPA
 Test Date: 16 April 2019

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity: 65.0%
 Test Distance: 5.680m [K=1.0000]
 Remarks: TCA-45W-VS
 HELVAR LL1X70

ZONAL FLUX DIAGRAM

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	3284	3267	3413	3285	3278	3407	3524	3400	0- 10	327.5	327.5	6.57, 6.57
20	2690	2657	2914	2756	2788	3017	3071	2867	10- 20	883.2	1211	24.3, 24.3
30	1751	1842	1913	1942	1844	2120	2025	1973	20- 30	1096	2307	46.3, 46.3
40	891.7	1159	1031	1199	1036	1286	1106	1252	30- 40	939.5	3246	65.1, 65.1
50	493.3	654.1	549.7	671.2	569.6	716.3	588.8	706.1	40- 50	650.4	3897	78.2, 78.2
60	356.0	367.8	359.0	380.9	382.6	402.4	375.7	387.1	50- 60	429.1	4326	86.8, 86.8
70	252.8	233.9	238.1	243.4	273.9	256.0	247.3	241.0	60- 70	303.7	4630	92.9, 92.9
80	200.2	151.9	117.4	162.1	199.2	172.5	123.2	155.6	70- 80	215.0	4845	97.2, 97.2
90	203.9	116.7	7.492	108.2	190.1	116.6	8.000	114.6	80- 90	141.4	4986	100, 100
100									90-100			
110									100-110			
120									110-120			
130									120-130			
140									130-140			
150									140-150			
160									150-160			
170									160-170			
180									170-180			
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Conical surface Flux(90deg): 3606.8 lm

%lum = 72.3%

%lamp = 72.3%

Conical surface Flux(120deg): 4326 lm

%lum = 86.8%

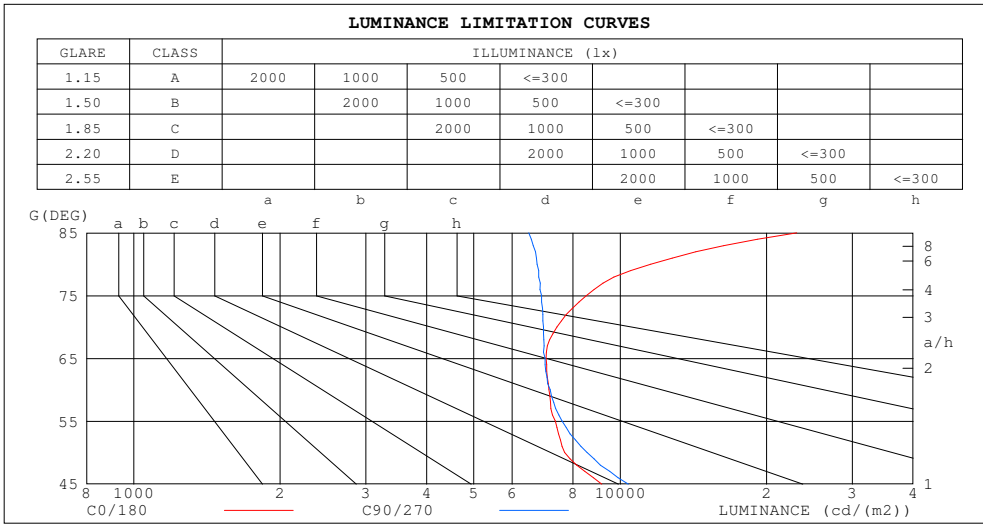
%lamp = 86.8%

C Range: 0 - 360DEG
 C Interval: 10.0DEG
 Test Speed: HIGH
 Temperature: 20DEG
 Operators: LITPA
 Test Date: 16 April 2019

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity: 65.0%
 Test Distance: 5.680m [K=1.0000]
 Remarks: TCA-45W-VS
 HELVAR LL1X70

LUMINANCE LIMITATION CURVES

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:



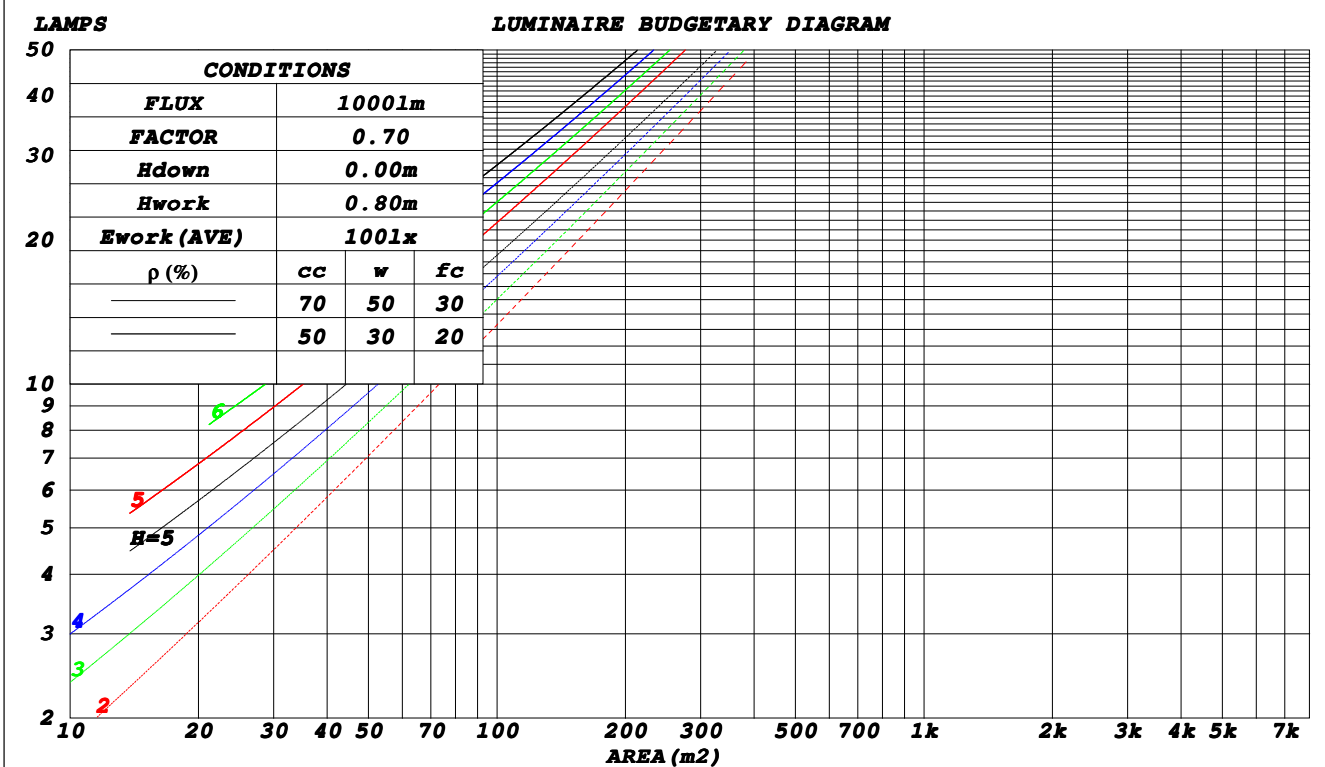
C Range: 0 - 360DEG
C Interval: 10.0DEG
Test Speed: HIGH
Temperature: 20DEG
Operators: LITPA
Test Date: 16 April 2019

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity: 65.0%
Test Distance: 5.680m [K=1.0000]
Remarks: TCA-45W-VS
HELVAR LL1X70

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:

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	1.19	1.19	1.19	1.16	1.16	1.16	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	.00
1.0	1.06	1.02	.99	1.04	1.00	.97	.00	.97	.94	.96	.93	.91	.92	.90	.89	.87
2.0	.95	.89	.85	.93	.88	.84	.90	.85	.82	.87	.83	.80	.84	.81	.78	.76
3.0	.86	.79	.74	.85	.78	.73	.82	.76	.72	.79	.74	.71	.77	.73	.69	.67
4.0	.78	.71	.65	.77	.70	.65	.75	.69	.64	.73	.67	.63	.70	.66	.62	.60
5.0	.72	.64	.58	.71	.63	.58	.69	.62	.58	.67	.61	.57	.65	.60	.56	.55
6.0	.66	.58	.53	.65	.58	.53	.63	.57	.52	.62	.56	.52	.60	.55	.51	.50
7.0	.61	.53	.48	.60	.53	.48	.59	.52	.48	.58	.52	.47	.56	.51	.47	.45
8.0	.57	.49	.44	.56	.49	.44	.55	.48	.44	.54	.48	.44	.53	.47	.43	.42
9.0	.53	.46	.41	.52	.45	.41	.51	.45	.40	.50	.44	.40	.49	.44	.40	.39
10.0	.49	.42	.38	.49	.42	.38	.48	.42	.38	.47	.41	.37	.46	.41	.37	.36



C Range: 0 - 360DEG
C Interval: 10.0DEG
Test Speed: HIGH
Temperature: 20DEG
Operators: LITPA
Test Date: 16 April 2019

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity: 65.0%
Test Distance: 5.680m [K=1.0000]
Remarks: TCA-45W-VS
HELVAR LL1X70

WEC AND CCEC

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:

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	.269	.153	.048	.262	.149	.047	.249	.143	.046	.237	.137	.044	.226	.131	.042		
2.0	.246	.135	.041	.240	.132	.041	.229	.127	.040	.219	.123	.038	.209	.118	.037		
3.0	.227	.121	.036	.222	.119	.036	.212	.115	.035	.203	.111	.034	.194	.108	.033		
4.0	.210	.109	.032	.206	.108	.032	.197	.105	.031	.189	.102	.031	.182	.099	.030		
5.0	.196	.100	.029	.192	.098	.029	.184	.096	.028	.177	.093	.028	.170	.091	.027		
6.0	.183	.092	.026	.179	.091	.026	.173	.088	.026	.166	.086	.025	.160	.084	.025		
7.0	.172	.085	.024	.168	.084	.024	.162	.082	.024	.157	.080	.023	.152	.079	.023		
8.0	.161	.079	.022	.159	.078	.022	.153	.077	.022	.148	.075	.022	.144	.074	.021		
9.0	.152	.074	.021	.150	.073	.021	.145	.072	.020	.141	.070	.020	.136	.069	.020		
10.0	.144	.069	.019	.142	.069	.019	.138	.067	.019	.134	.066	.019	.130	.065	.019		

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	.190	.190	.190	.163	.163	.163	.111	.111	.111	.064	.064	.064	.020	.020	.020	
1.0	.177	.156	.138	.152	.134	.118	.104	.092	.082	.060	.053	.048	.019	.017	.015	
2.0	.166	.132	.104	.142	.114	.089	.098	.079	.062	.056	.046	.037	.018	.015	.012	
3.0	.156	.114	.080	.134	.098	.070	.092	.068	.049	.053	.040	.029	.017	.013	.009	
4.0	.147	.100	.064	.126	.087	.056	.087	.060	.039	.050	.035	.023	.016	.011	.008	
5.0	.139	.089	.052	.120	.077	.046	.082	.054	.032	.048	.032	.019	.015	.010	.006	
6.0	.132	.080	.044	.113	.070	.038	.078	.049	.027	.045	.029	.016	.015	.009	.005	
7.0	.125	.073	.037	.108	.064	.032	.074	.045	.023	.043	.026	.014	.014	.009	.004	
8.0	.119	.067	.032	.102	.058	.028	.071	.041	.020	.041	.024	.012	.013	.008	.004	
9.0	.113	.062	.028	.098	.054	.024	.068	.038	.017	.039	.022	.010	.013	.007	.003	
10.0	.108	.058	.025	.093	.050	.021	.065	.035	.015	.038	.021	.009	.012	.007	.003	

C Range: 0 - 360DEG
 C Interval: 10.0DEG
 Test Speed: HIGH
 Temperature: 20DEG
 Operators: LITPA
 Test Date: 16 April 2019

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity: 65.0%
 Test Distance: 5.680m [K=1.0000]
 Remarks: TCA-45W-VS
 HELVAR LL1X70

UGR(Unified Glare Rating) Table

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm											
NAME: TCA					TYPE:LED			WEIGHT:3.2kg			
SPEC.:45W					DIM.: 68mmX1430mmX78mm			SERIAL No.:			
MFR.: LITPA AYDINLATMA					SUR.:			Shielding Angle:			
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	18.2	19.5	18.4	19.6	19.8	18.6	19.9	18.9	20.1	20.3	
	3H	19.6	20.8	19.9	21.0	21.2	19.7	20.9	20.0	21.1	21.3
	4H	20.5	21.6	20.8	21.8	22.1	20.2	21.4	20.5	21.6	21.8
	6H	21.5	22.6	21.8	22.8	23.1	20.7	21.8	21.1	22.1	22.3
	8H	22.2	23.2	22.5	23.5	23.8	20.9	22.0	21.3	22.2	22.5
	12H	23.1	24.1	23.5	24.4	24.7	21.1	22.1	21.4	22.4	22.7
4H	2H	18.7	19.8	19.0	20.0	20.3	19.0	20.1	19.3	20.3	20.6
	3H	20.4	21.3	20.7	21.6	21.9	20.3	21.3	20.6	21.6	21.8
	4H	21.4	22.3	21.8	22.6	22.9	21.0	21.9	21.4	22.2	22.5
	6H	22.7	23.5	23.1	23.8	24.2	21.7	22.5	22.1	22.8	23.2
	8H	23.5	24.3	23.9	24.6	25.0	22.0	22.7	22.4	23.1	23.5
	12H	24.6	25.3	25.1	25.7	26.1	22.2	22.9	22.6	23.3	23.7
8H	4H	21.7	22.5	22.2	22.9	23.2	21.4	22.1	21.8	22.5	22.9
	6H	23.3	23.9	23.7	24.3	24.7	22.3	22.9	22.7	23.3	23.7
	8H	24.3	24.9	24.8	25.3	25.8	22.7	23.3	23.1	23.7	24.1
	12H	25.7	26.2	26.2	26.6	27.1	23.0	23.5	23.5	24.0	24.4
12H	4H	21.8	22.5	22.2	22.9	23.3	21.5	22.2	21.9	22.5	22.9
	6H	23.4	24.0	23.9	24.4	24.8	22.5	23.0	22.9	23.5	23.9
	8H	24.6	25.0	25.0	25.5	26.0	23.0	23.5	23.4	23.9	24.4
Variations with the observer position at spacings:											
S = 1.0H	+ 0.2 / - 0.3					+ 0.3 / - 0.4					
1.5H	+ 0.1 / - 0.1					+ 0.3 / - 0.4					
2.0H	+ 0.2 / - 0.2					+ 0.4 / - 0.3					

CIE Pub.117, 4986 lm Total Lamp Luminous Flux Corrected ($8\log(F/F_0) = 5.6$)

C Range: 0 - 360DEG
 C Interval: 10.0DEG
 Test Speed: HIGH
 Temperature:20DEG
 Operators:LITPA
 Test Date:16 April 2019

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity:65.0%
 Test Distance:5.680m [K=1.0000]
 Remarks: TCA-45W-VS
 HELVAR LL1X70

UTILIZATION FACTORS TABLE

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:

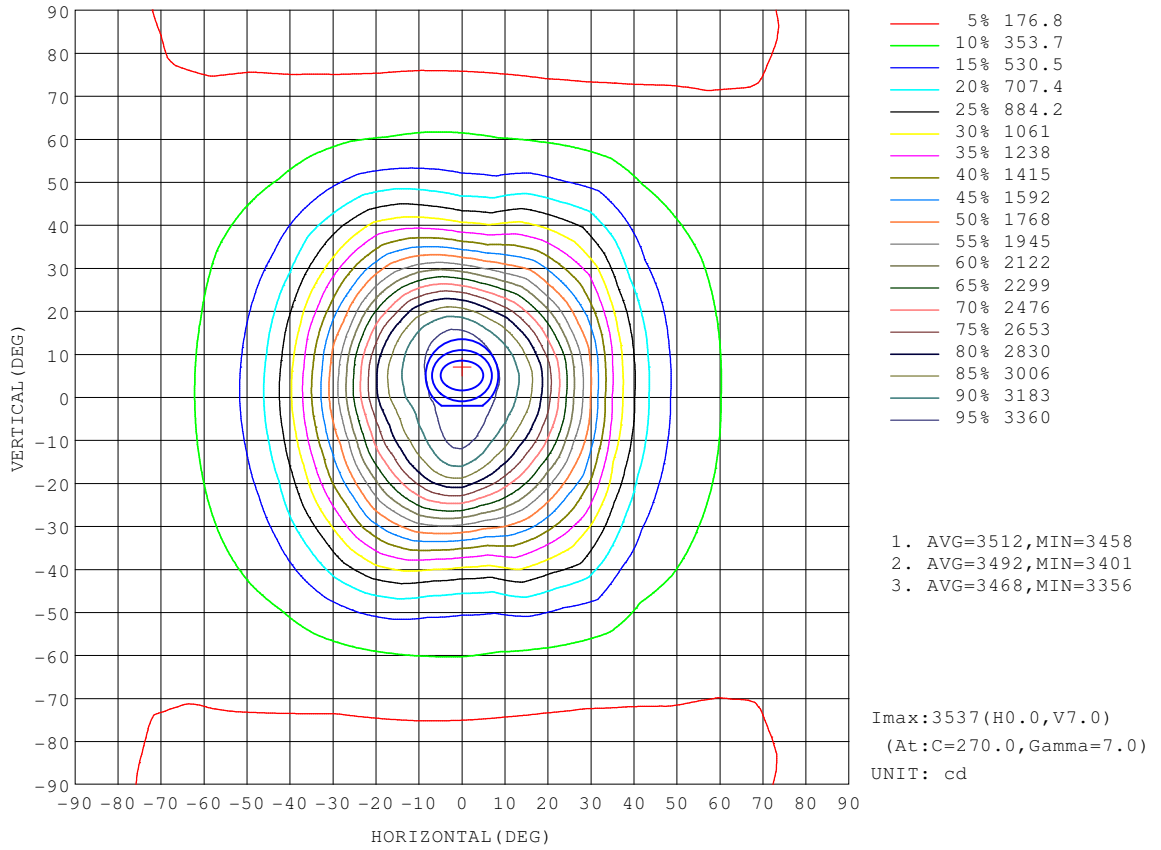
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS (PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	70	61	55	69	61	55	68	60	55	50
0.80	79	70	64	78	69	64	77	69	63	58
1.00	86	77	71	85	76	71	83	77	70	65
1.25	91	83	77	90	82	77	88	81	76	70
1.50	95	88	82	94	87	82	91	85	80	74
2.00	100	93	88	99	92	88	95	90	86	79
2.50	103	97	92	101	96	91	98	93	89	82
3.00	106	100	96	104	99	95	100	96	92	85
4.00	109	104	100	107	102	99	103	99	96	88
5.00	111	107	103	108	105	102	104	101	99	90
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		

C Range: 0 - 360DEG
C Interval: 10.0DEG
Test Speed: HIGH
Temperature: 20DEG
Operators: LITPA
Test Date: 16 April 2019

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity: 65.0%
Test Distance: 5.680m [K=1.0000]
Remarks: TCA-45W-VS
HELVAR LL1X70

ISOCANDELA DIAGRAM

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:

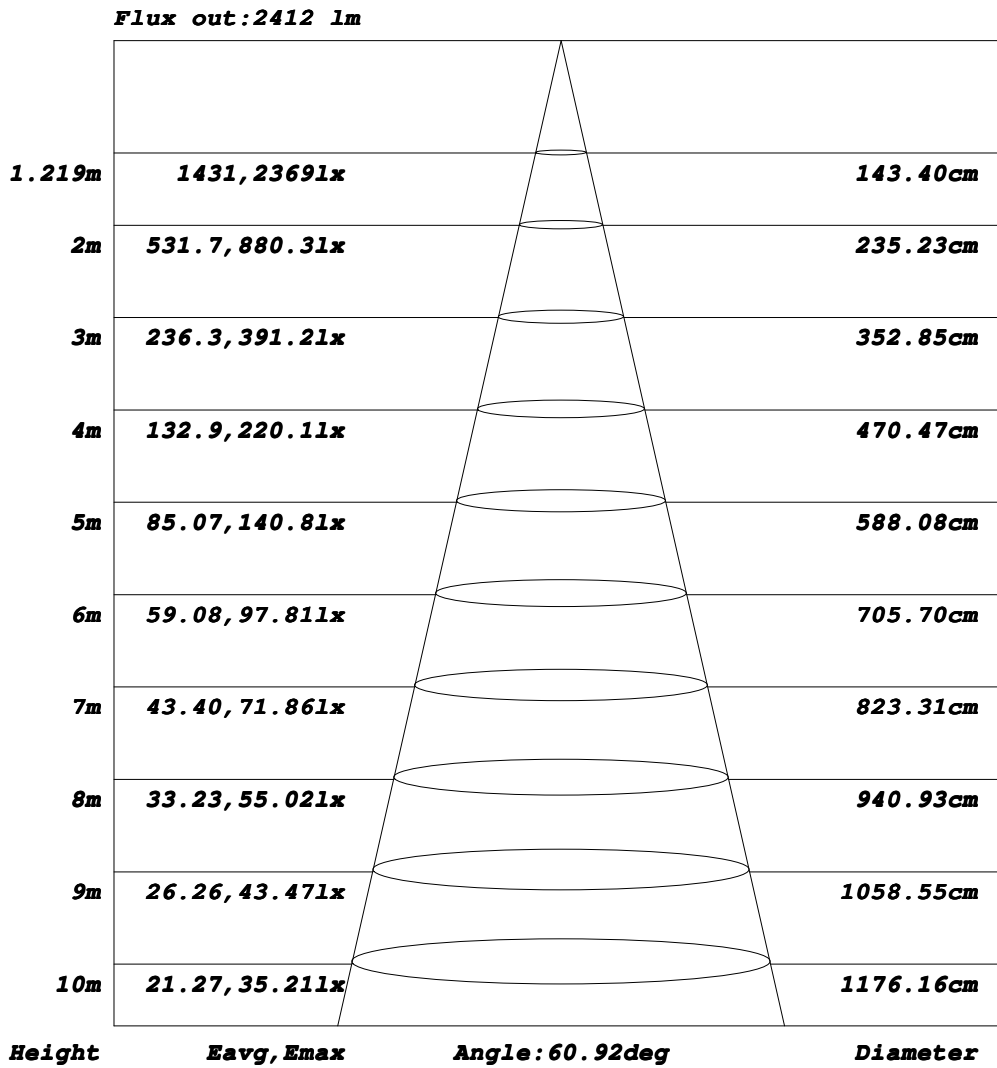


C Range: 0 - 360DEG
C Interval: 10.0DEG
Test Speed: HIGH
Temperature:20DEG
Operators:LITPA
Test Date:16 April 2019

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity:65.0%
Test Distance:5.680m [K=1.0000]
Remarks: TCA-45W-VS
HELVAR LL1X70

AAI Figure

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:



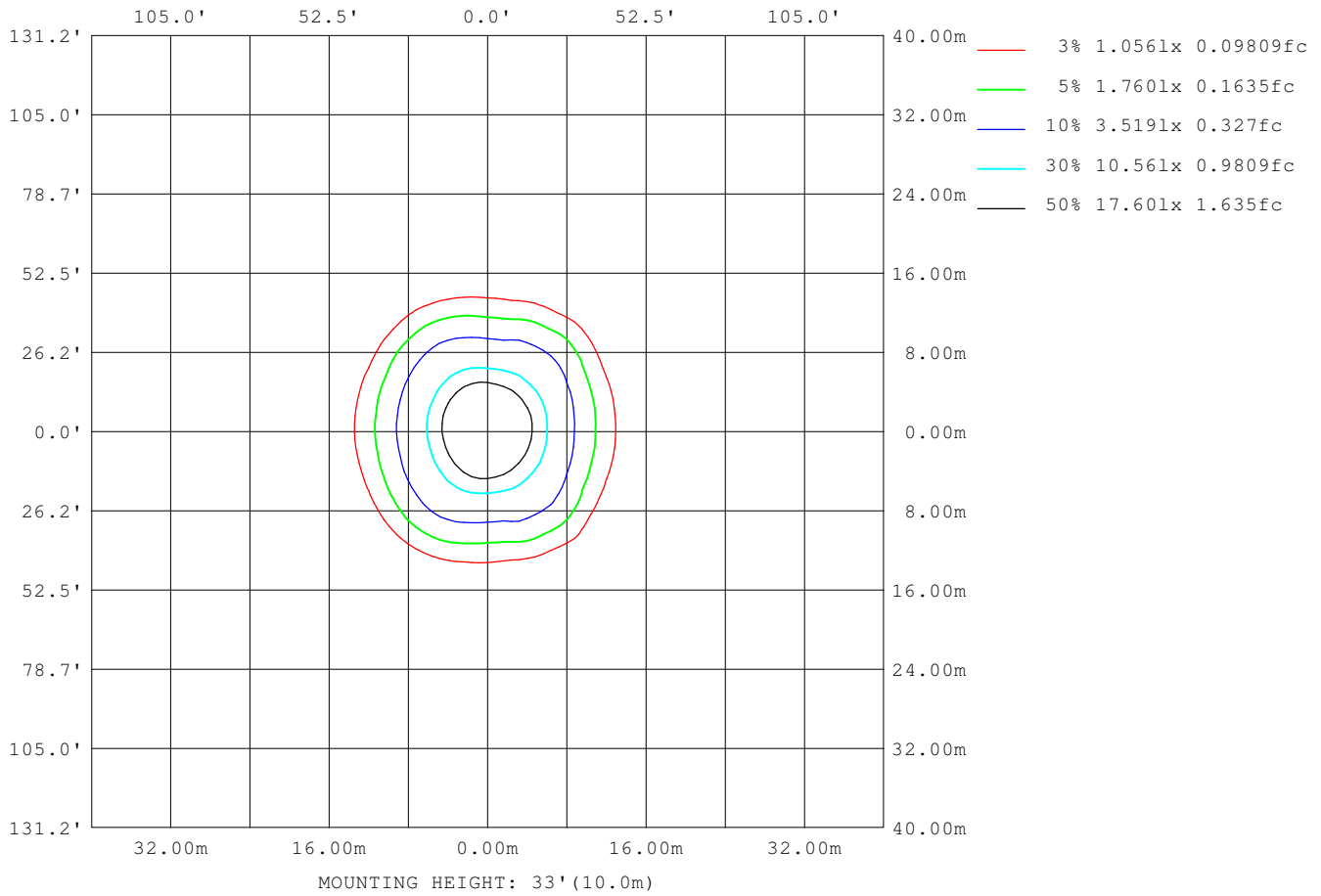
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
 C Interval: 10.0DEG
 Test Speed: HIGH
 Temperature: 20DEG
 Operators: LITPA
 Test Date: 16 April 2019

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity: 65.0%
 Test Distance: 5.680m [K=1.0000]
 Remarks: TCA-45W-VS
 HELVAR LL1X70

ISOLUX DIAGRAM

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:



C Range: 0 - 360DEG
C Interval: 10.0DEG
Test Speed: HIGH
Temperature: 20DEG
Operators: LITPA
Test Date: 16 April 2019

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity: 65.0%
Test Distance: 5.680m [K=1.0000]
Remarks: TCA-45W-VS
HELVAR LL1X70

LED Avg.L Report

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:

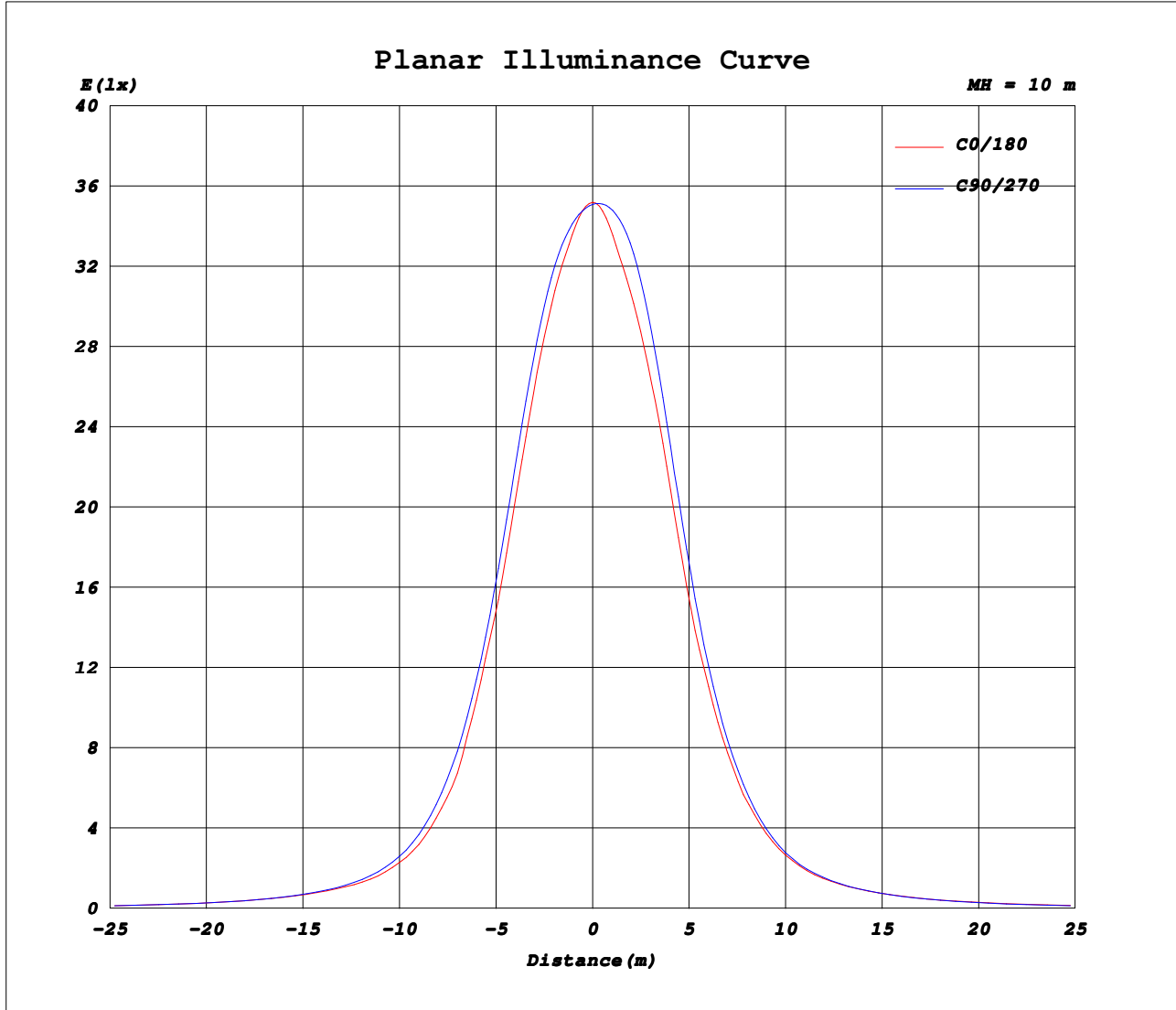
AvgL	cd/m2
L_0~180 (65) av	7300
L_0~180 (75) av	8827
L_0~180 (85) av	22466
L_90~270 (65) av	7146
L_90~270 (75) av	7050
L_90~270 (85) av	6752
L_45 (65) av	7101
L_45 (75) av	7762
L_45 (85) av	14357

Standard: GB/T 29293-2012

C Range: 0 - 360DEG
C Interval: 10.0DEG
Test Speed: HIGH
Temperature:20DEG
Operators:LITPA
Test Date:16 April 2019

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity:65.0%
Test Distance:5.680m [K=1.0000]
Remarks: TCA-45W-VS
HELVAR LL1X70

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 10.0DEG
Test Speed: HIGH
Temperature: 20DEG
Operators: LITPA
Test Date: 16 April 2019

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity: 65.0%
Test Distance: 5.680m [K=1.0000]
Remarks: TCA-45W-VS
 HELVAR LL1X70

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:

Table--1

UNIT: cd

[illegible]

C Range: 0 - 360DEG
C Interval: 10.0DEG
Test Speed: HIGH
Temperature: 20DEG
Operators: LITPA
Test Date: 16 April 2019

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity:65.0%
Test Distance:5.680m [K=1.0000]
Remarks: TCA-45W-VS
HELVAR LL1X70

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:230.22V I:0.1921A P:42.773W PF:0.9673 Freq:50.01Hz Lamp Flux:4986.19x1 lm		
NAME: TCA	TYPE:LED	WEIGHT:3.2kg
SPEC.:45W	DIM.: 68mmX1430mmX78mm	SERIAL No.:
MFR.: LITPA AYDINLATMA	SUR.:	Shielding Angle:

Table--2

UNIT: cd

[illegible]

C Range: 0 - 360DEG
C Interval: 10.0DEG
Test Speed: HIGH
Temperature: 20DEG
Operators: LITPA
Test Date: 16 April 2019

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity:65.0%
Test Distance:5.680m [K=1.0000]
Remarks: TCA-45W-VS
HELVAR LL1X70