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ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806
19-TST-0039- 43/R1
03-19

Müşterinin Adı Adresi
Customer name/address

: HERA EĞLENCE VE MİMARİ AYDINLATMA SİSTEMLERİ A.Ş.
Güllübağlar Mah. Kahramanlar Cad. No:3-1 34906 PENDİK-
İSTANBUL/TÜRKİYE

İstek Numarası
Order No

: 19-TST-0039

Numunenin Adı ve Tarifi
Name and identity of test item

: SWORD RGB DIRECT VIEW (90cm)
Sword RGB Direct View (90cm)

Numunenin kabul tarihi
The date of receipt of test item

: 26.02.2019

Açıklamalar
Remarks

: DGC'ye , IES LM-79-08 standardı uyarınca fotometrik ölçümler yapılmıştır.
Photometric measurement has been applied to EUT according to IESNA LM-79-08

Deneyin Yapıldığı Tarih
Date of Test

: 27.02.2019-07.03.2019

Raporun Sayfa Sayısı
Number of Pages of the Report

:57

Deney laboratuvarı olarak faaliyet gösteren TÜV AUSTRIA TURK, International Accreditation Service, Inc. (IAS) TL-806 ile TS EN ISO/IEC 17025 Nisan 2012 standardına göre akredite edilmiştir.
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Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.
The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

Bu rapor, laboratuvara gönderilen numunelere uygulanan deney/deneyler sonucu hazırlanmıştır. Müşteriye ait diğer numuneleri kapsamaz.
This report was prepared according to test results of specimens sent to laboratory. It doesn't contain other specimens belonging to customer.



Deney Sorumlusu
Person in charge of test

Saltuk Buğra GÜNEŞ

Onaylayan
Approval

Gürhan CANSIZ

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1.1

DGC, Çevre Şartları ve Sembollerin Tanımları (Description of the EUT, Environmental Conditions and Symbol Definitions)

Markası / Brand

: HERA

Modeli / Model

: RGB Direct View (90cm)

Seri Numarası / Serial Number

: Test Numunesi
Test Sample

Beyan Gücü / Rated Power

: 21,6 W

Beyan Gerilimi / Rated Voltage

: 48 VDC

Sembollerin Tanımı / Definitions of Symbols

DGC= Deneden Geçen Cihaz
EUT=Equipment Under Test



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1.2 Deney Standartları (Test Standards)

Deneyleyler aşağıdaki standartlara göre yapılmıştır (The tests were performed according to following standards):

Standart / Standard

- IESNA LM-79-08 Electrical and Photometric Measurements of Solid-State Lighting Products

1.3 Deney Ekipmanları (Test Equipments)

Kayıt No. (ID – No.)	Tip (Type)	Kalibrasyon Tarihi (Calibration Date)	Sonraki Kalibrasyon Tarihi (Next Calibration Date)	Kontrol (Check Point)
LAB-011	Goniophotometer	09.01.2019	09.01.2020	<input checked="" type="checkbox"/>
LAB-015	AC Power Supply	05.06.2018	05.06.2019	<input checked="" type="checkbox"/>
LAB-027	Powermeter	09.01.2019	09.01.2020	<input checked="" type="checkbox"/>
LAB-023	Standart Lamp	09.01.2019	09.01.2020	<input checked="" type="checkbox"/>
LAB-012	Integrating sphere	28.05.2018	28.05.2019	<input checked="" type="checkbox"/>

1.3 Komponent listesi (Component list)

Komponent (Component)	Üretici (Manufacturer)	Model (Model)	Standart no. (Standart No.)	Sertifika no. (Certificate No.)
LED	Cree Inc	CLQ6A	Led-RGBW IF=20Ma VR=5V φV=Initial Data x 0,7	-
PCB	C13090_R1.0	1.6mm FR44 Layers, 35+35+35+35um Cu	-	-



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2.1 Kırmızı Renk Deney Sonuçları (Test Results of the Red Color)

Elektriksel Ölçümler
(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,260
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1513
Güç Faktörü (PF) (Power Factor)	-
Ölçülen Frekans (Hz) (Input Frequency)	-
Ortam Sıcaklığı / Bağıl Nem (Ambient Temperature / Relative Humidity)	25,1 °C 48% Rh
Stabilizasyon Süresi (Stabilization Time)	60 dk ±5dk

Fotometrik Ölçüm Sonuçları
(Photometric Measurement Results)

Toplam Işık Akısı (Total Luminous Flux) (lm)	69,21
Maksimum Işık Şiddeti (Max. Light Intensity) (cd)	23,84
Armatür Etkinliği (Luminaire Efficacy) (lm/W)	9,53



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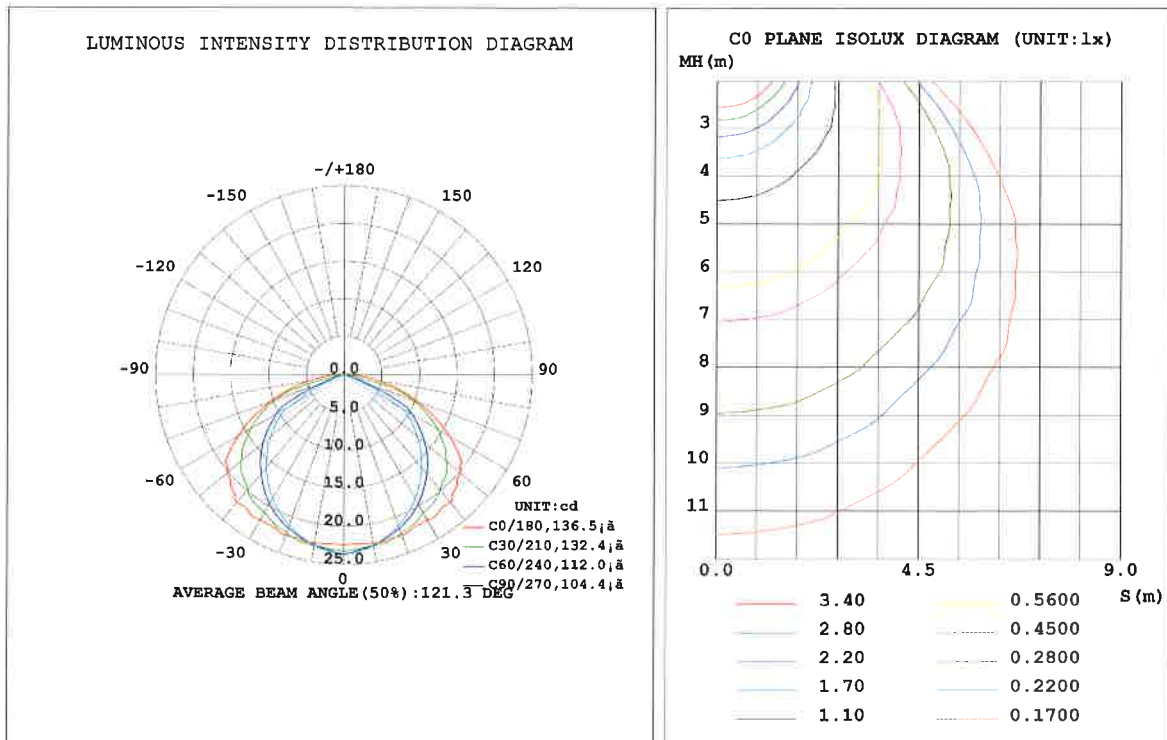
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2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)



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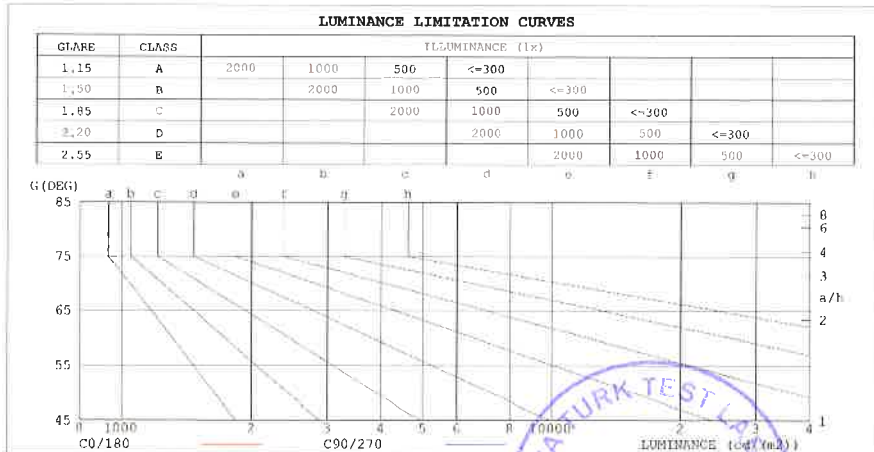
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2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)

**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
5	22.41	23.17	23.43	23.17	22.41	23.17	23.43	23.17	0- 5	0.5545	0.5545	0.80,0.80
10	22.58	22.85	22.85	22.85	22.58	22.85	22.85	22.85	5- 10	1.641	2.195	3.17,3.17
15	22.55	22.54	22.10	22.54	22.55	22.54	22.10	22.54	10- 15	2.686	4.881	7.05,7.05
20	22.58	22.03	21.17	22.03	22.58	22.03	21.17	22.03	15- 20	3.656	8.538	12.3,12.3
25	22.21	21.24	20.10	21.24	22.21	21.24	20.10	21.24	20- 25	4.526	13.06	18.9,18.9
30	22.20	20.39	18.90	20.39	22.20	20.39	18.90	20.39	25- 30	5.270	18.33	26.5,26.5
35	22.06	19.38	17.53	19.38	22.06	19.38	17.53	19.38	30- 35	5.910	24.24	35,35
40	22.09	18.36	16.04	18.36	22.09	18.36	16.04	18.36	35- 40	6.385	30.63	44.3,44.3
45	21.14	17.08	14.43	17.08	21.14	17.08	14.43	17.08	40- 45	6.692	37.32	53.9,53.9
50	20.20	15.66	12.70	15.66	20.20	15.66	12.70	15.66	45- 50	6.772	44.09	63.7,63.7
55	18.81	14.11	10.96	14.11	18.81	14.11	10.96	14.11	50- 55	6.635	50.73	73.3,73.3
60	16.15	12.17	8.603	12.17	16.15	12.17	8.603	12.17	55- 60	6.224	56.95	82.3,82.3
65	13.28	10.15	3.092	10.15	13.28	10.15	3.092	10.15	60- 65	5.227	62.18	89.8,89.8
70	10.30	5.635	0.3043	5.635	10.30	5.635	0.3043	5.635	65- 70	3.609	65.79	95.1,95.1
75	7.191	0.5759	0.0534	0.5759	7.191	0.5759	0.0534	0.5759	70- 75	2.056	67.84	98,98
80	4.169	0.0762	0.0718	0.0762	4.169	0.0762	0.0718	0.0762	75- 80	0.9763	68.82	99.4,99.4
85	1.586	0.0671	0.0025	0.0671	1.586	0.0671	0.0025	0.0671	80- 85	0.3406	69.16	99.9,99.9
90	0.0139	0	0	0	0.0139	0	0	0	85- 90	0.0512	69.21	100,100
95	0	0	0	0	0	0	0	0	90- 95	0.0000	69.21	100,100
100	0	0	0	0	0	0	0	0	95-100	0	69.21	100,100
105	0	0	0	0	0	0	0	0	100-105	0	69.21	100,100
110	0	0	0	0	0	0	0	0	105-110	0	69.21	100,100
115	0	0	0	0	0	0	0	0	110-115	0	69.21	100,100
120	0	0	0	0	0	0	0	0	115-120	0	69.21	100,100
125	0	0	0	0	0	0	0	0	120-125	0	69.21	100,100
130	0	0	0	0	0	0	0	0	125-130	0	69.21	100,100
135	0	0	0	0	0	0	0	0	130-135	0	69.21	100,100
140	0	0	0	0	0	0	0	0	135-140	0	69.21	100,100
145	0	0	0	0	0	0	0	0	140-145	0	69.21	100,100
150	0	0	0	0	0	0	0	0	145-150	0	69.21	100,100
155	0	0	0	0	0	0	0	0	150-155	0	69.21	100,100
160	0	0	0	0	0	0	0	0	155-160	0	69.21	100,100
165	0	0	0	0	0	0	0	0	160-165	0	69.21	100,100
170	0	0	0	0	0	0	0	0	165-170	0	69.21	100,100
175	0	0	0	0	0	0	0	0	170-175	0.0000	69.21	100,100
180	0	0	0	0	0	0	0	0	175-180	0	69.21	100,100
DEG	LUMINOUS INTENSITY: cd										UNIT: lm	



LUMINANCE cd/ (m2)

G (DEG)	C0/180	C90/270
85	182	0
80	240	4
75	278	2
70	301	9
65	314	73
60	323	172
55	328	191
50	314	198
45	299	204

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz raporlar geçersizdir.

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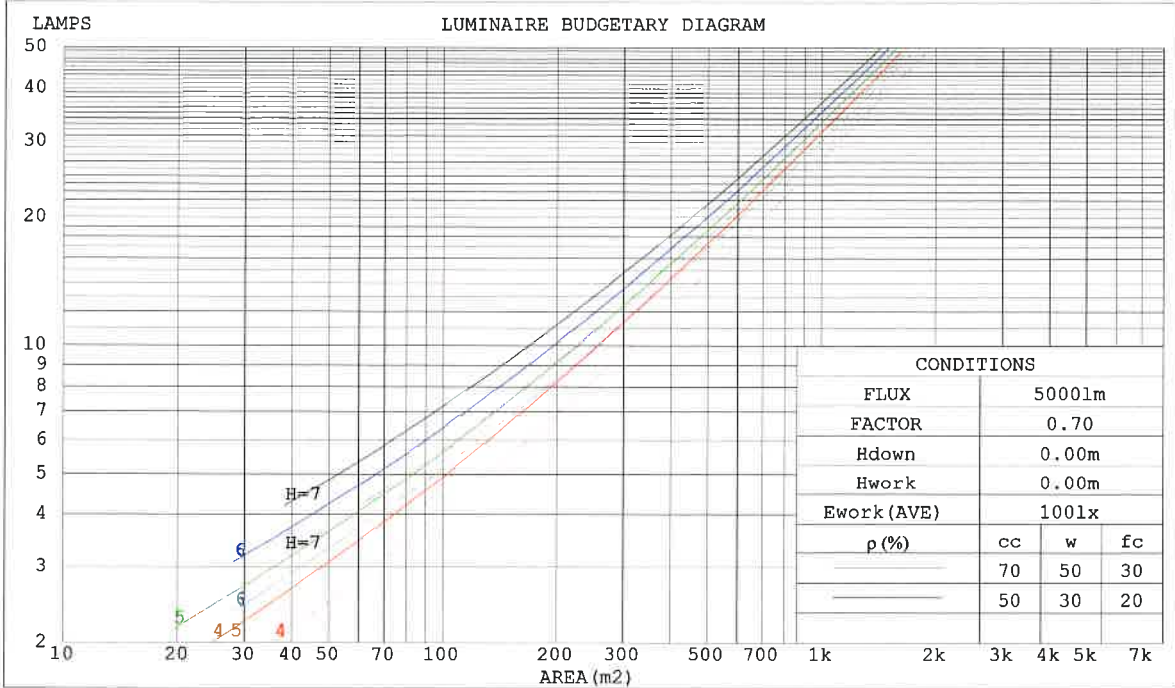
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2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

pcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	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	1.05	1.01	.97	1.03	.99	.96	.99	.96	.93	.95	.92	.90	.91	.89	.87	.85
2.0	.92	.85	.80	.90	.84	.79	.86	.81	.77	.83	.79	.75	.80	.77	.73	.71
3.0	.81	.73	.66	.79	.72	.66	.76	.70	.64	.73	.68	.63	.71	.66	.62	.60
4.0	.71	.62	.56	.70	.62	.55	.67	.60	.55	.65	.59	.54	.63	.58	.53	.51
5.0	.63	.54	.48	.62	.54	.48	.60	.53	.47	.58	.52	.46	.56	.51	.46	.44
6.0	.57	.48	.41	.56	.47	.41	.54	.47	.41	.52	.46	.41	.51	.45	.40	.38
7.0	.51	.43	.36	.51	.42	.36	.49	.42	.36	.48	.41	.36	.46	.40	.36	.34
8.0	.47	.38	.32	.46	.38	.32	.45	.37	.32	.43	.37	.32	.42	.36	.32	.30
9.0	.43	.35	.29	.42	.34	.29	.41	.34	.29	.40	.33	.29	.39	.33	.28	.27
10.0	.39	.31	.26	.39	.31	.26	.38	.31	.26	.37	.30	.26	.36	.30	.26	.24



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2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)

WEC AND CCEC

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pf _c	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)									
0.0																
1.0	.288	.164	.052	.281	.160	.051	.267	.153	.049	.255	.147	.047	.244	.142	.046	
2.0	.279	.153	.047	.273	.150	.046	.261	.145	.045	.251	.141	.044	.241	.136	.043	
3.0	.263	.140	.042	.257	.138	.041	.247	.134	.041	.237	.130	.040	.229	.127	.039	
4.0	.245	.127	.037	.240	.126	.037	.231	.122	.037	.222	.119	.036	.215	.117	.036	
5.0	.228	.116	.034	.224	.115	.033	.216	.112	.033	.208	.110	.033	.201	.107	.032	
6.0	.212	.106	.030	.209	.105	.030	.201	.103	.030	.195	.101	.030	.188	.099	.029	
7.0	.198	.098	.028	.195	.097	.028	.188	.095	.027	.182	.093	.027	.177	.092	.027	
8.0	.186	.091	.025	.182	.090	.025	.177	.088	.025	.171	.087	.025	.166	.085	.025	
9.0	.174	.084	.024	.171	.084	.023	.166	.082	.023	.161	.081	.023	.157	.080	.023	
10.0	.164	.079	.022	.161	.078	.022	.157	.077	.022	.152	.076	.021	.148	.074	.021	

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pf _c	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	.179	.156	.136	.153	.134	.117	.105	.092	.081	.060	.053	.047	.019	.017	.015	
2.0	.171	.132	.100	.146	.114	.086	.100	.079	.060	.058	.046	.035	.019	.015	.011	
3.0	.163	.114	.075	.140	.099	.065	.096	.068	.046	.055	.040	.027	.018	.013	.009	
4.0	.156	.101	.059	.134	.087	.051	.092	.061	.036	.053	.036	.021	.017	.012	.007	
5.0	.149	.090	.048	.128	.078	.041	.088	.055	.029	.051	.032	.017	.016	.010	.006	
6.0	.142	.082	.039	.122	.071	.034	.084	.050	.024	.049	.029	.014	.016	.010	.005	
7.0	.135	.075	.033	.116	.065	.029	.080	.046	.021	.047	.027	.012	.015	.009	.004	
8.0	.129	.070	.029	.111	.060	.025	.077	.042	.018	.045	.025	.011	.014	.008	.004	
9.0	.123	.065	.025	.106	.056	.022	.073	.039	.016	.043	.023	.009	.014	.008	.003	
10.0	.117	.060	.022	.101	.052	.020	.070	.037	.014	.041	.022	.008	.013	.007	.003	



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2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)

Uncorrected UGR Table

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	9.8	11.3	10.1	11.5	11.7	6.8	8.3	7.0	8.5	8.7
3H	11.6	13.0	11.9	13.2	13.5	6.7	8.1	7.0	8.3	8.6
4H	12.3	13.6	12.6	13.9	14.1	6.6	7.9	6.9	8.2	8.4
6H	12.8	14.0	13.1	14.3	14.6	6.5	7.7	6.8	8.0	8.3
8H	12.9	14.1	13.3	14.4	14.7	6.4	7.6	6.8	7.9	8.2
12H	13.0	14.1	13.3	14.4	14.7	6.4	7.5	6.7	7.8	8.1
4H 2H	10.2	11.5	10.5	11.7	12.0	7.8	9.1	8.1	9.4	9.7
3H	12.2	13.4	12.6	13.7	14.0	7.8	8.9	8.1	9.2	9.5
4H	13.0	14.1	13.4	14.4	14.7	7.7	8.7	8.1	9.1	9.4
6H	13.6	14.5	14.0	14.9	15.3	7.6	8.5	8.0	8.9	9.2
8H	13.8	14.6	14.2	15.0	15.4	7.6	8.4	8.0	8.8	9.2
12H	13.9	14.7	14.3	15.1	15.5	7.5	8.3	7.9	8.7	9.1
8H 4H	12.9	13.8	13.3	14.1	14.5	8.0	8.8	8.4	9.2	9.6
6H	13.5	14.2	14.0	14.6	15.1	7.9	8.6	8.3	9.0	9.4
8H	13.7	14.3	14.2	14.8	15.2	7.8	8.5	8.3	8.9	9.3
12H	13.9	14.4	14.3	14.8	15.3	7.8	8.3	8.3	8.8	9.3
12H 4H	12.9	13.7	13.3	14.0	14.4	8.0	8.7	8.4	9.1	9.5
6H	13.5	14.1	14.0	14.5	15.0	7.9	8.5	8.3	8.9	9.4
8H	13.7	14.2	14.2	14.7	15.1	7.8	8.4	8.3	8.8	9.3
Variations with the observer position at spacings:										
S = 1.0H	+ 0.2 / - 0.2					+ 0.4 / - 0.6				
1.5H	+ 0.2 / - 0.2					+ 0.9 / - 1.3				
2.0H	+ 0.3 / - 0.6					+ 0.6 / - 1.1				

CIE Pub.117 Corrected 69.21 lm Total Lamp Luminous Flux. (8log(F/F0) = -9.3)



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2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)

UTILIZATION FACTORS TABLE

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	57	45	38	56	45	38	55	44	38	31
0.80	67	56	48	66	55	48	65	54	48	41
1.00	76	65	58	75	65	58	73	66	57	50
1.25	84	73	66	82	73	66	80	71	65	58
1.50	89	79	72	87	78	72	84	77	71	63
2.00	96	88	82	94	87	81	91	84	79	72
2.50	100	92	87	98	91	86	94	88	84	76
3.00	103	97	91	101	95	90	97	92	88	80
4.00	107	102	97	105	100	96	101	97	93	85
5.00	109	105	101	107	103	100	103	99	96	87
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNM = 1.25			



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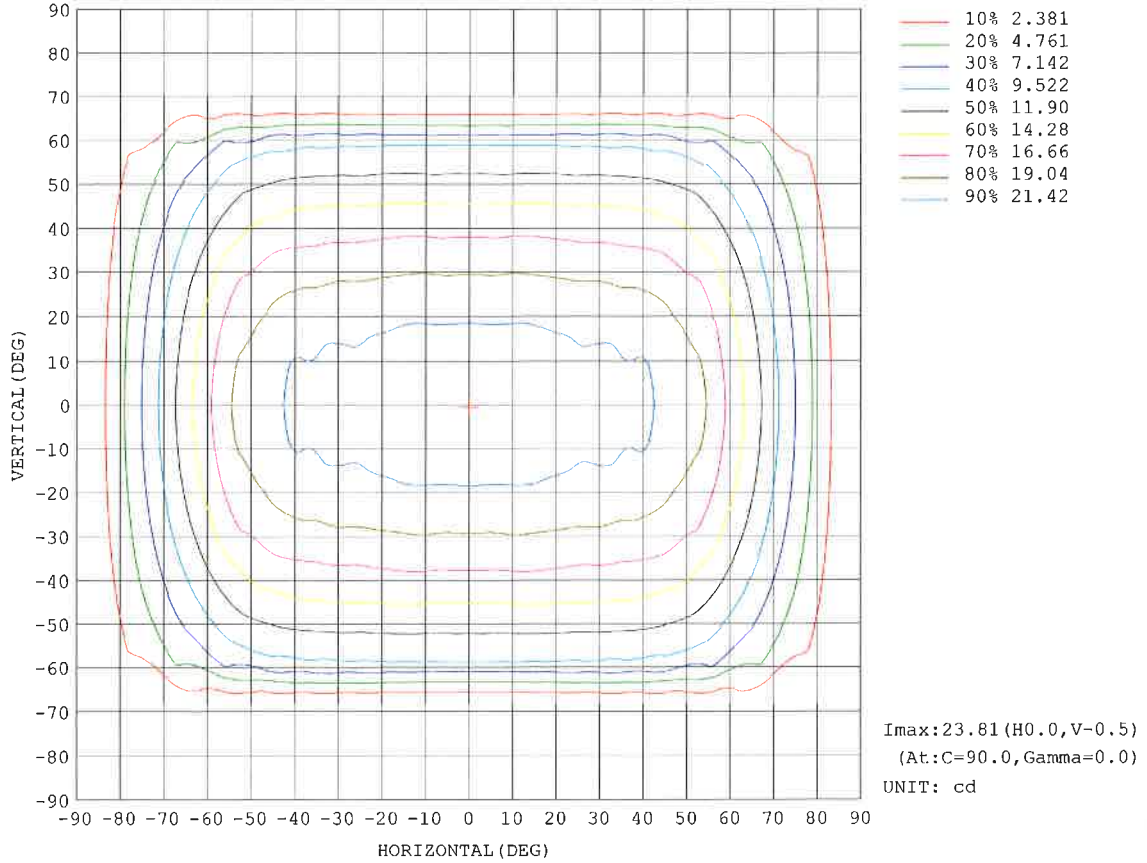
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2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)

ISOCANDELA DIAGRAM



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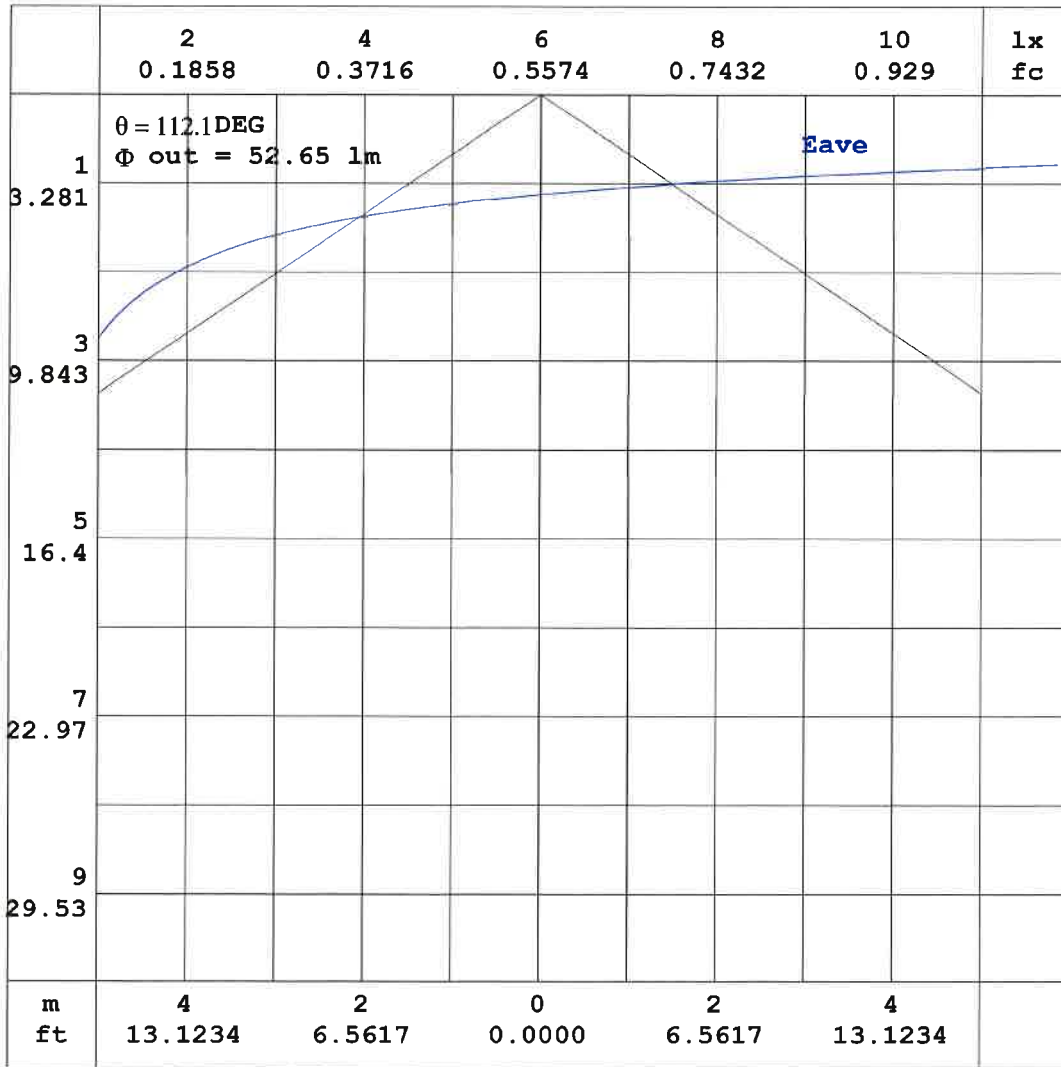
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2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)**AAI CURVES**

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



Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz raporlar geçersizdir.

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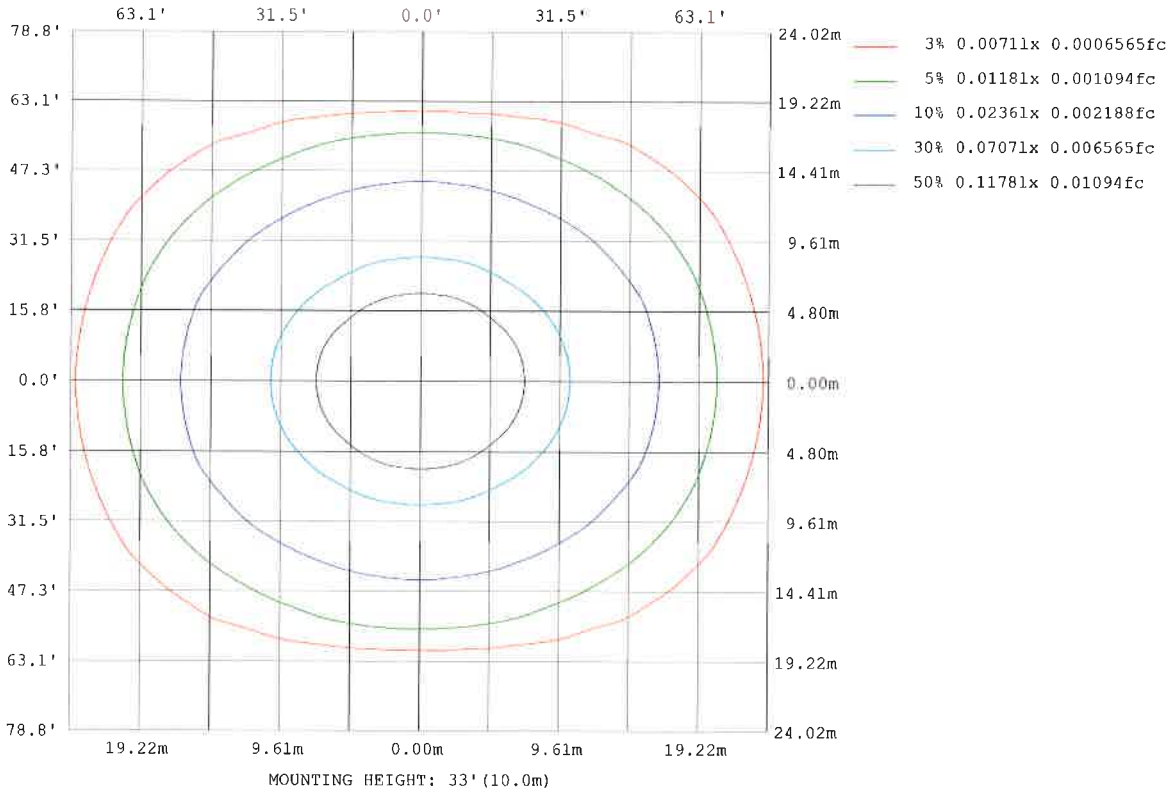
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2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)

ISOLUX DIAGRAM



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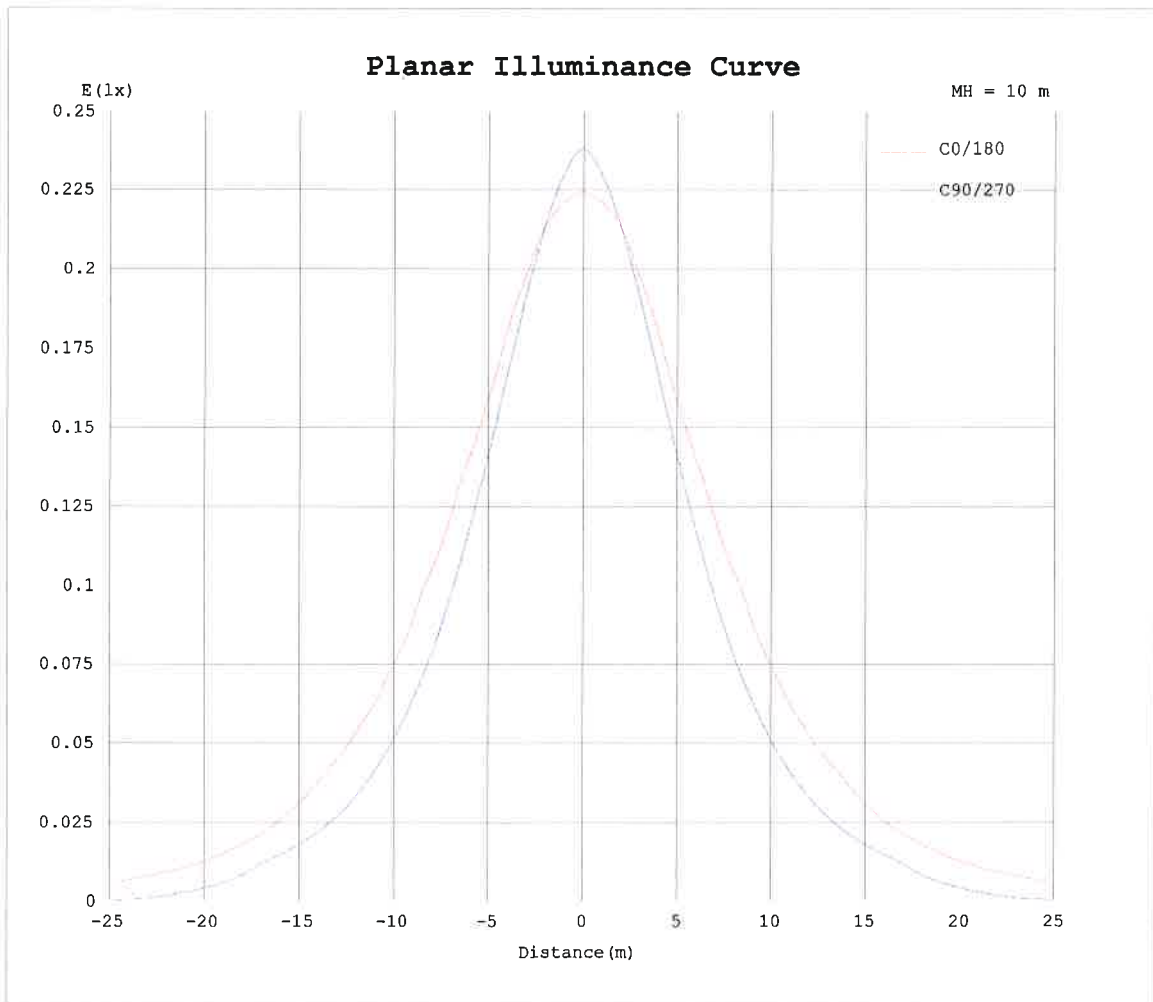
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2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)



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2.2 Kırmızı Renk Spektrokolorimetrik Deney Sonuçları (spectrocolorimetric Test Results of the Red color)

Elektriksel Ölçümler

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,260
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1513
Güç Faktörü (PF) (Power Factor)	-
Ölçülen Frekans (Hz) (Input Frequency)	-
Ortam Sıcaklığı / Bağıl Nem (Ambient Temperature / Relative Humidity)	25 °C 48% Rh
Stabilizasyon Süresi (Stabilization Time)	60 dk ±5dk

Spektrokolorimetrik Ölçüm Sonuçları

(Spectrocolorimetric Measurement Results)

Chrom x	0,6877
Chrom y	0,3081
Duv	0,00
Chrom u'	0,5169
Chrom v'	0,5210
Peak	629 nm
Dominant	620 nm
CCT	0 K
Nominal CCT	-
Ra(CRI)	0
R9	0
S/P Ratio	0,1
Preburning time	1 hr
Test Configuration	4π



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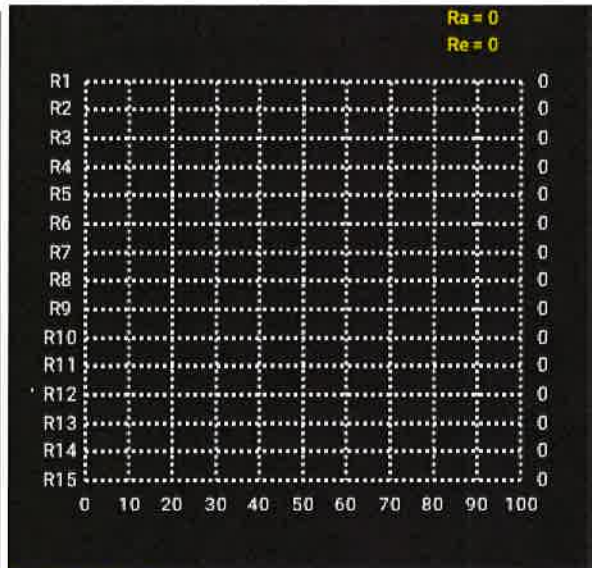
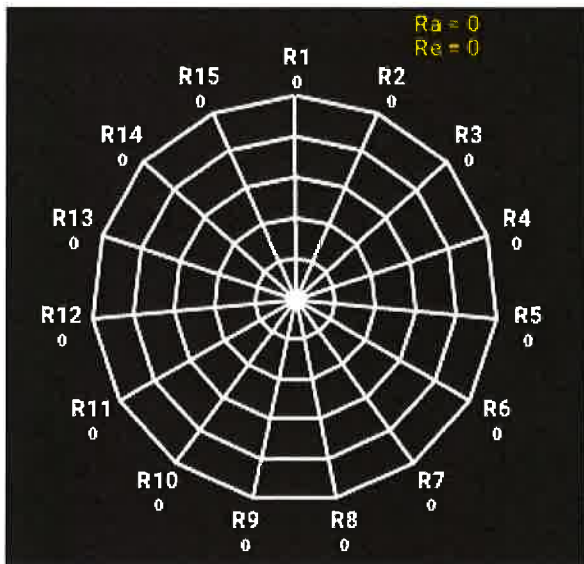
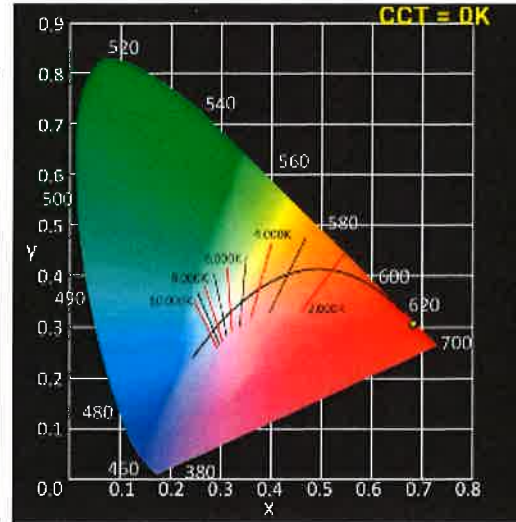
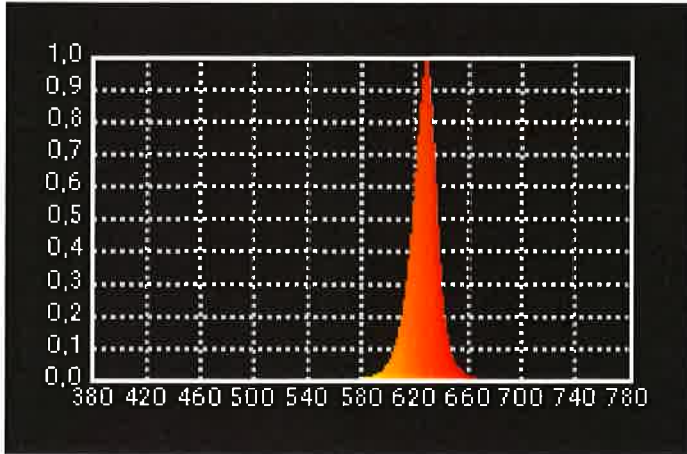
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2.2 Kırmızı Renk Spektrokolorimetrik Deney Sonuçları (spectrocolorimetric Test Results of the Red color)

Spectral Power Distribution



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2.3 Mavi Renk Deney Sonuçları (Test Results of the Blue Color)

Elektriksel Ölçümler

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,262
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1513
Güç Faktörü (PF) (Power Factor)	-
Ölçülen Frekans (Hz) (Input Frequency)	-
Ortam Sıcaklığı / Bağıl Nem (Ambient Temperature / Relative Humidity)	25,1 °C 48% Rh
Stabilizasyon Süresi (Stabilization Time)	60 dk ±5dk

Fotometrik Ölçüm Sonuçları

(Photometric Measurement Results)

Toplam Işık Akısı (Total Luminous Flux) (lm)	59,768
Maksimum Işık Şiddeti (Max. Light Intensity) (cd)	17,49
Armatür Etkinliği (Luminaire Efficacy) (lm/W)	8,23



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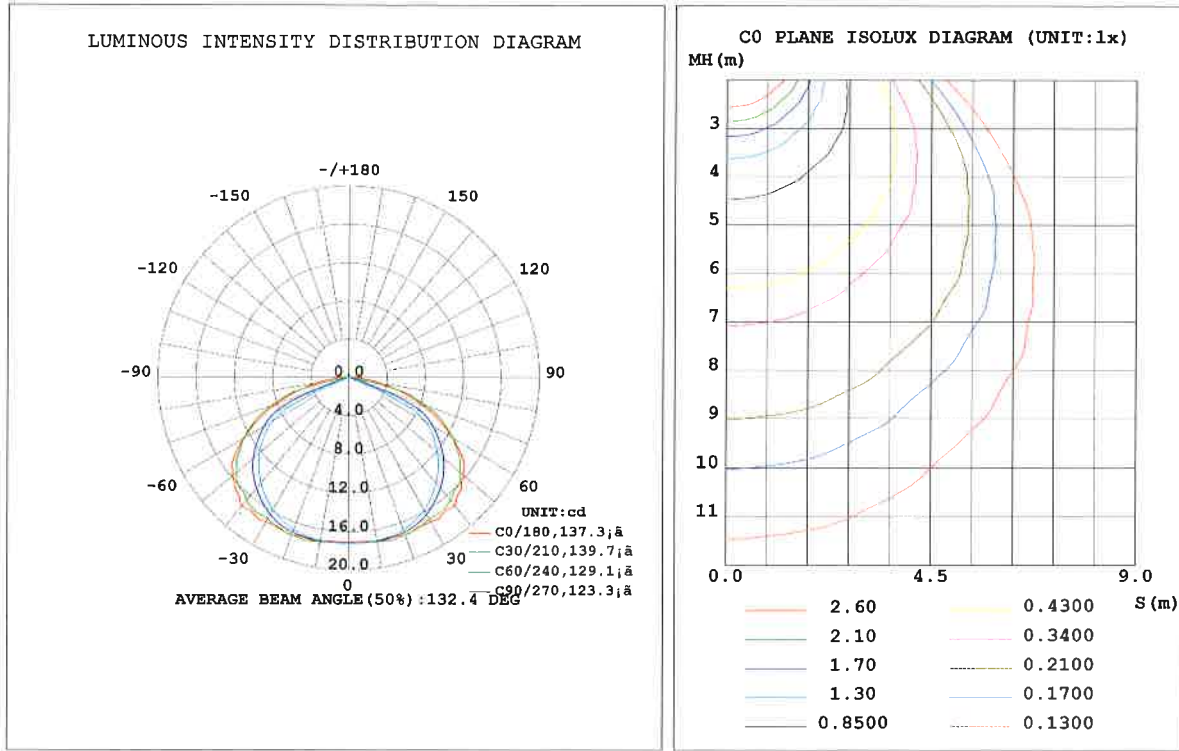
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2.3 Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)



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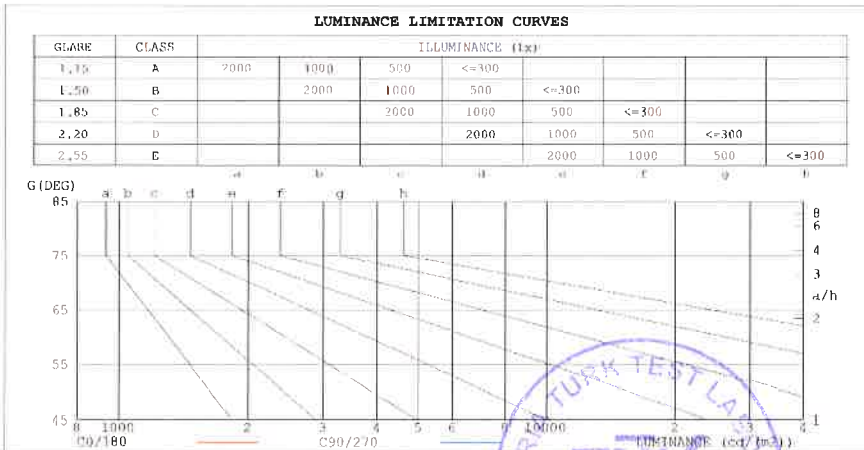
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2.3 Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)

**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
5	17.07	17.21	17.20	17.21	17.07	17.21	17.20	17.21	0- 5	0.4111	0.4111	0.69, 0.69
10	17.23	17.26	17.18	17.26	17.23	17.26	17.18	17.26	5- 10	1.233	1.644	2.75, 2.75
15	17.24	17.33	17.03	17.33	17.24	17.33	17.03	17.33	10- 15	2.050	3.694	6.18, 6.18
20	17.34	17.26	16.76	17.26	17.34	17.26	16.76	17.26	15- 20	2.838	6.532	10.9, 10.9
25	17.13	16.99	16.35	16.99	17.13	16.99	16.35	16.99	20- 25	3.577	10.11	16.9, 16.9
30	17.24	16.65	15.80	16.65	17.24	16.65	15.80	16.65	25- 30	4.245	14.35	24, 24
35	17.24	16.18	15.11	16.18	17.24	16.18	15.11	16.18	30- 35	4.854	19.21	32.1, 32.1
40	17.32	15.67	14.28	15.67	17.32	15.67	14.28	15.67	35- 40	5.351	24.56	41.1, 41.1
45	16.62	14.94	13.28	14.94	16.62	14.94	13.28	14.94	40- 45	5.717	30.28	50.7, 50.7
50	15.82	14.02	12.14	14.02	15.82	14.02	12.14	14.02	45- 50	5.898	36.17	60.5, 60.5
55	14.66	12.97	10.85	12.97	14.66	12.97	10.85	12.97	50- 55	5.882	42.06	70.4, 70.4
60	12.64	11.46	9.367	11.46	12.64	11.46	9.367	11.46	55- 60	5.620	47.68	79.8, 79.8
65	10.43	9.758	5.580	9.758	10.43	9.758	5.580	9.758	60- 65	5.016	52.69	88.2, 88.2
70	8.060	7.044	0.7361	7.044	8.060	7.044	0.7361	7.044	65- 70	3.726	56.42	94.4, 94.4
75	5.615	1.510	0.0238	1.510	5.615	1.510	0.0238	1.510	70- 75	2.073	58.49	97.9, 97.9
80	3.251	0.0436	0.0266	0.0436	3.251	0.0436	0.0266	0.0436	75- 80	0.9319	59.42	99.4, 99.4
85	1.230	0.0254	0	0.0254	1.230	0.0254	0	0.0254	80- 85	0.3027	59.72	99.9, 99.9
90	0.0069	0	0	0	0.0069	0	0	0	85- 90	0.0430	59.77	100, 100
95	0	0	0	0	0	0	0	0	90- 95	0.0000	59.77	100, 100
100	0	0	0	0	0	0	0	0	95-100	0	59.77	100, 100
105	0	0	0	0	0	0	0	0	100-105	0.0002	59.77	100, 100
110	0	0	0	0	0	0	0	0	105-110	0	59.77	100, 100
115	0	0	0	0	0	0	0	0	110-115	0	59.77	100, 100
120	0	0	0	0	0	0	0	0	115-120	0	59.77	100, 100
125	0	0	0	0	0	0	0	0	120-125	0	59.77	100, 100
130	0	0	0	0	0	0	0	0	125-130	0	59.77	100, 100
135	0	0	0	0	0	0	0	0	130-135	0	59.77	100, 100
140	0	0	0	0	0	0	0	0	135-140	0	59.77	100, 100
145	0	0	0	0	0	0	0	0	140-145	0	59.77	100, 100
150	0	0	0	0	0	0	0	0	145-150	0	59.77	100, 100
155	0	0	0	0	0	0	0	0	150-155	0	59.77	100, 100
160	0	0	0	0	0	0	0	0	155-160	0	59.77	100, 100
165	0	0	0	0	0	0	0	0	160-165	0	59.77	100, 100
170	0	0	0	0	0	0	0	0	165-170	0	59.77	100, 100
175	0	0	0	0	0	0	0	0	170-175	0	59.77	100, 100
180	0	0	0	0	0	0	0	0	175-180	0	59.77	100, 100



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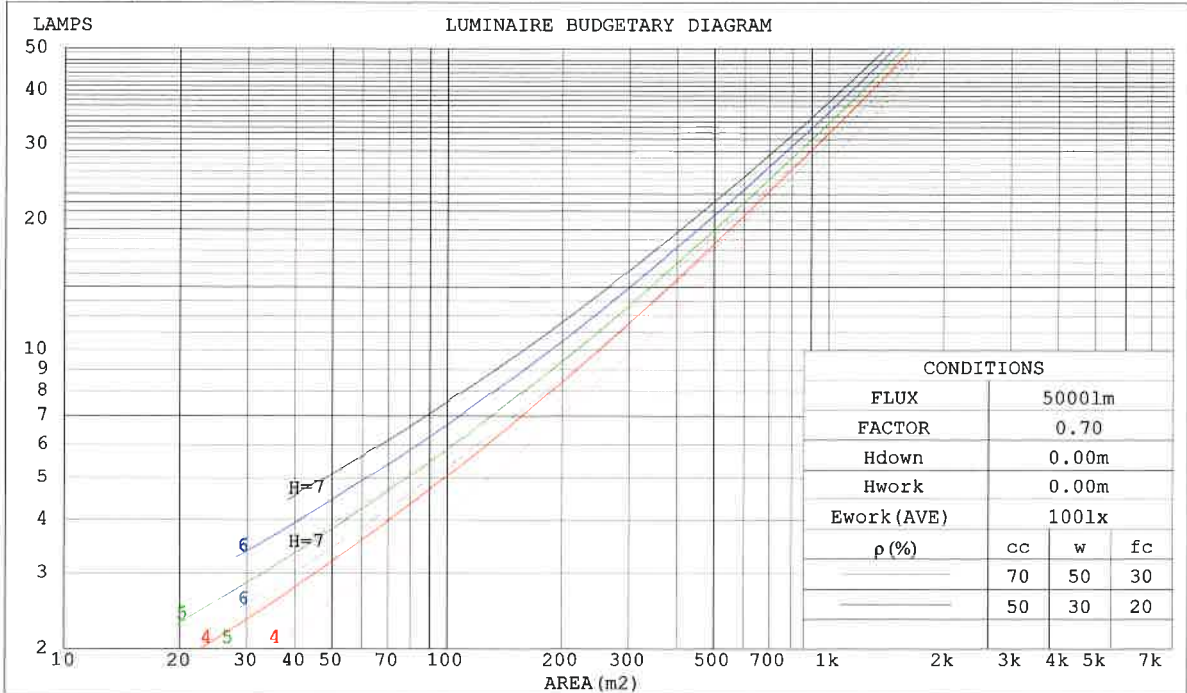
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2.3 Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

pcc	80%			70%			50%			30%			10%			0
	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρw																
ρfc																
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	1.05	1.00	.97	1.02	.98	.95	.98	.95	.92	.94	.92	.89	.91	.88	.87	.85
2.0	.91	.84	.78	.89	.83	.77	.85	.80	.76	.82	.78	.74	.79	.75	.72	.70
3.0	.79	.71	.64	.78	.70	.64	.75	.68	.63	.72	.66	.62	.69	.65	.60	.58
4.0	.70	.61	.54	.68	.60	.53	.66	.59	.53	.63	.57	.52	.61	.56	.51	.49
5.0	.62	.53	.46	.61	.52	.46	.59	.51	.45	.57	.50	.45	.55	.49	.44	.42
6.0	.55	.46	.40	.54	.46	.39	.52	.45	.39	.51	.44	.39	.49	.43	.38	.36
7.0	.50	.41	.35	.49	.40	.34	.47	.40	.34	.46	.39	.34	.45	.38	.34	.32
8.0	.45	.36	.30	.44	.36	.30	.43	.36	.30	.42	.35	.30	.41	.34	.30	.28
9.0	.41	.33	.27	.41	.33	.27	.40	.32	.27	.38	.32	.27	.37	.31	.27	.25
10.0	.38	.30	.24	.37	.30	.24	.36	.29	.24	.35	.29	.24	.35	.28	.24	.22



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2.3 Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)

WEC AND CCEC

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pf _c	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)									
0.0																
1.0	.298	.169	.054	.291	.166	.053	.277	.159	.051	.265	.153	.049	.254	.147	.047	
2.0	.289	.158	.049	.282	.156	.048	.271	.151	.047	.260	.146	.046	.250	.141	.045	
3.0	.271	.144	.043	.265	.142	.043	.255	.138	.042	.245	.135	.041	.237	.131	.041	
4.0	.252	.131	.039	.247	.129	.038	.238	.126	.038	.229	.123	.037	.221	.120	.037	
5.0	.234	.119	.035	.230	.118	.034	.221	.115	.034	.214	.113	.034	.207	.110	.033	
6.0	.218	.109	.031	.214	.108	.031	.206	.106	.031	.199	.104	.030	.193	.102	.030	
7.0	.203	.100	.028	.199	.099	.028	.193	.097	.028	.187	.096	.028	.181	.094	.028	
8.0	.189	.093	.026	.186	.092	.026	.180	.090	.026	.175	.089	.026	.170	.087	.025	
9.0	.177	.086	.024	.175	.085	.024	.169	.084	.024	.164	.082	.024	.160	.081	.023	
10.0	.167	.080	.022	.164	.079	.022	.159	.078	.022	.155	.077	.022	.151	.076	.022	

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pf _c	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	.179	.156	.135	.154	.134	.116	.105	.092	.081	.060	.053	.047	.019	.017	.015	
2.0	.172	.132	.098	.147	.114	.085	.101	.079	.059	.058	.046	.035	.019	.015	.011	
3.0	.165	.114	.074	.141	.099	.064	.097	.069	.045	.056	.040	.027	.018	.013	.009	
4.0	.158	.101	.058	.135	.087	.050	.093	.061	.035	.054	.036	.021	.017	.012	.007	
5.0	.150	.091	.047	.129	.078	.041	.089	.055	.029	.052	.032	.017	.017	.011	.006	
6.0	.144	.082	.039	.123	.071	.034	.085	.050	.024	.049	.029	.014	.016	.010	.005	
7.0	.137	.076	.033	.118	.066	.028	.081	.046	.020	.047	.027	.012	.015	.009	.004	
8.0	.130	.070	.028	.112	.061	.025	.078	.043	.017	.045	.025	.010	.015	.008	.003	
9.0	.124	.065	.025	.107	.056	.022	.074	.040	.015	.043	.023	.009	.014	.008	.003	
10.0	.119	.061	.022	.102	.053	.019	.071	.037	.014	.041	.022	.008	.013	.007	.003	



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2.3 Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)

Uncorrected UGR Table

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	9.0	10.6	9.3	10.8	11.0	7.4	8.9	7.6	9.1	9.3
3H	10.8	12.2	11.1	12.5	12.7	7.7	9.1	8.0	9.3	9.6
4H	11.5	12.8	11.8	13.1	13.4	7.6	8.9	7.9	9.2	9.4
6H	11.9	13.2	12.3	13.5	13.8	7.4	8.7	7.8	9.0	9.3
8H	12.1	13.3	12.4	13.6	13.9	7.4	8.6	7.7	8.9	9.2
12H	12.1	13.3	12.5	13.6	13.9	7.3	8.5	7.7	8.8	9.1
4H 2H	9.6	11.0	9.9	11.2	11.5	8.3	9.7	8.7	10.0	10.2
3H	11.6	12.8	12.0	13.1	13.4	8.7	9.9	9.1	10.2	10.5
4H	12.4	13.5	12.8	13.8	14.2	8.6	9.7	9.0	10.0	10.4
6H	13.0	14.0	13.4	14.3	14.7	8.5	9.5	8.9	9.8	10.2
8H	13.2	14.1	13.6	14.4	14.8	8.5	9.4	8.9	9.7	10.1
12H	13.3	14.1	13.7	14.5	14.9	8.4	9.2	8.9	9.6	10.0
8H 4H	12.4	13.3	12.8	13.7	14.0	8.9	9.8	9.3	10.1	10.5
6H	13.0	13.8	13.5	14.2	14.6	8.8	9.5	9.3	9.9	10.4
8H	13.2	13.9	13.7	14.3	14.7	8.8	9.4	9.2	9.8	10.3
12H	13.3	13.9	13.8	14.3	14.8	8.7	9.3	9.2	9.7	10.2
12H 4H	12.4	13.2	12.8	13.6	14.0	8.9	9.7	9.3	10.1	10.5
6H	13.0	13.6	13.5	14.1	14.5	8.8	9.5	9.3	9.9	10.3
8H	13.2	13.7	13.7	14.2	14.7	8.8	9.3	9.3	9.8	10.2
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.2					+ 0.5 / - 0.6				
1.5H	+ 0.2 / - 0.3					+ 0.5 / - 0.6				
2.0H	+ 0.3 / - 0.6					+ 0.7 / - 1.6				

CIE Pub.117 Corrected 59.77 lm Total Lamp Luminous Flux. (8log(F/F0) = -9.8)



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2.3 Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)

UTILIZATION FACTORS TABLE

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) $k(RI) \times RCR = 5$									
$k = 0.60$	55	43	36	54	43	36	53	42	35	29
0.80	66	54	46	65	53	46	63	52	45	38
1.00	75	63	56	73	63	55	71	64	55	48
1.25	82	71	64	81	71	64	78	69	63	56
1.50	88	77	70	86	77	70	83	75	69	61
2.00	95	86	80	93	85	79	90	83	78	70
2.50	99	91	85	97	90	84	93	87	82	74
3.00	102	96	90	100	94	89	96	91	87	79
4.00	107	101	97	104	99	95	100	96	92	84
5.00	109	104	100	107	102	99	102	99	96	87
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			



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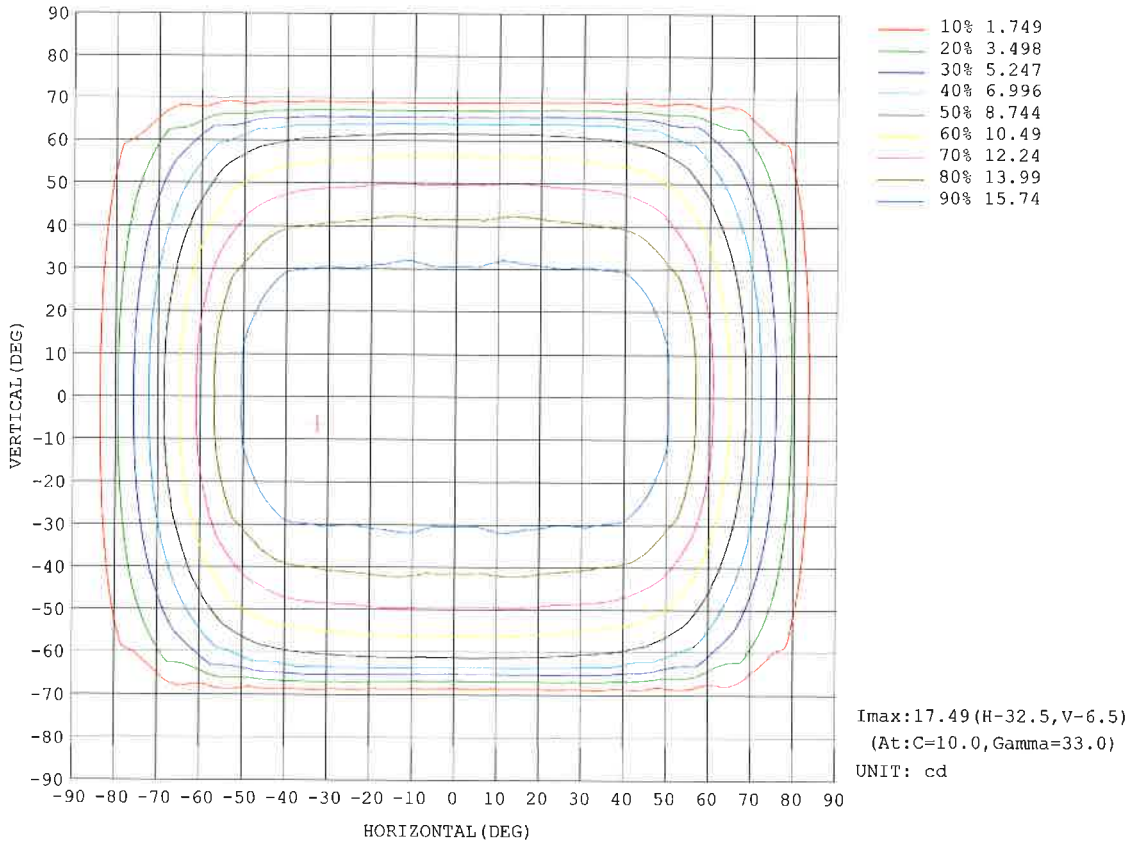
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2.3

Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)

ISOCANDELA DIAGRAM



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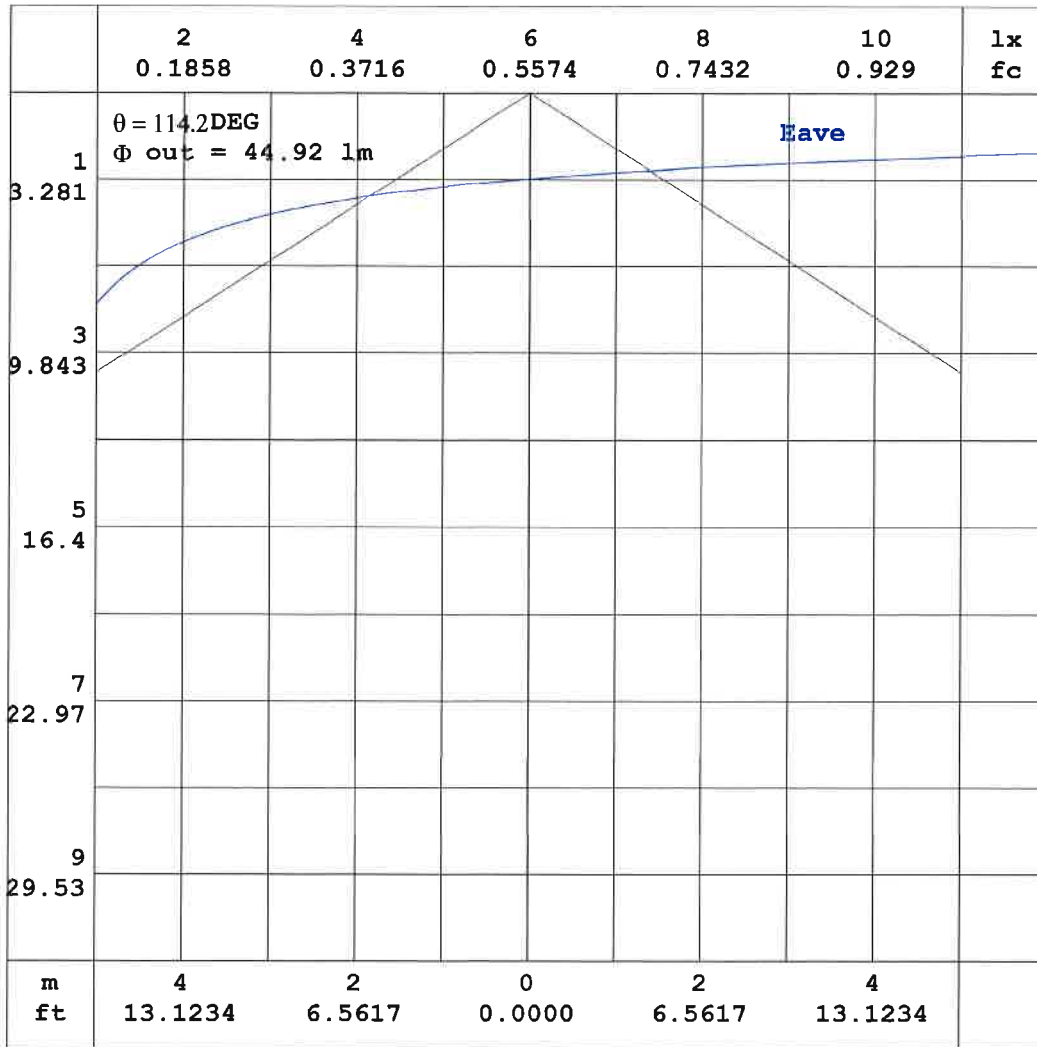
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2.3 Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)

AAI CURVES



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



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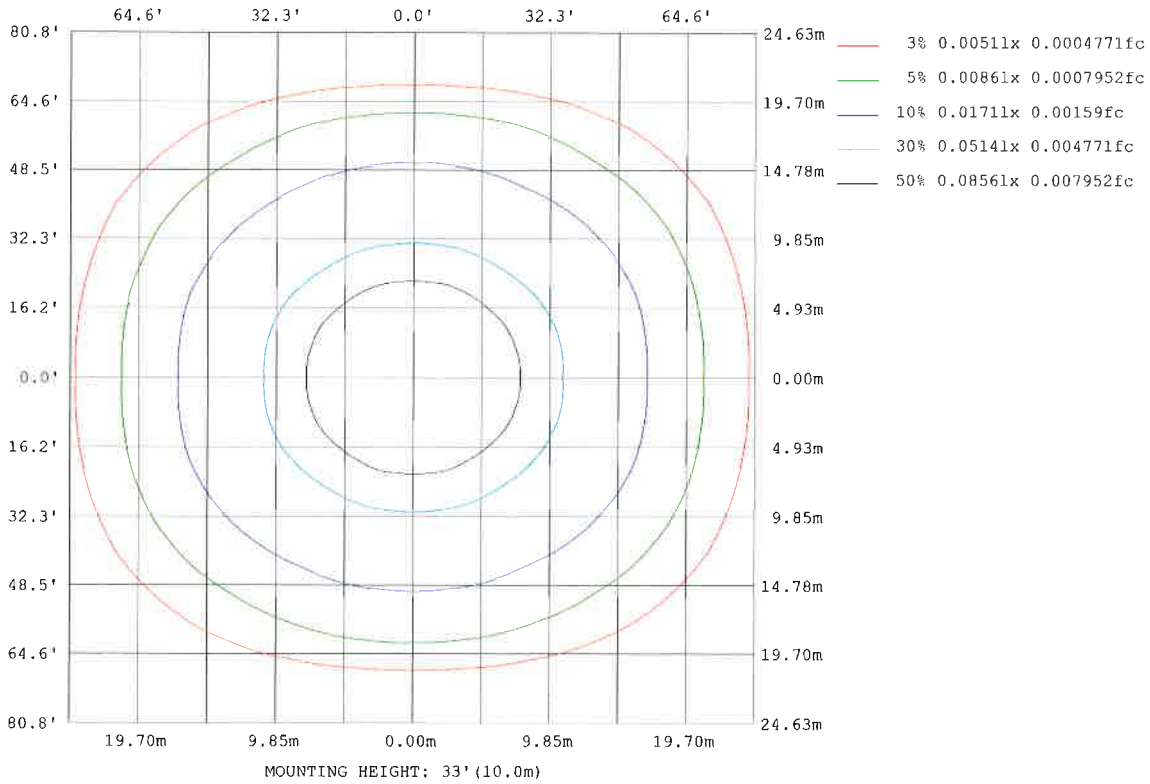
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2.3 Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)

ISOLUX DIAGRAM



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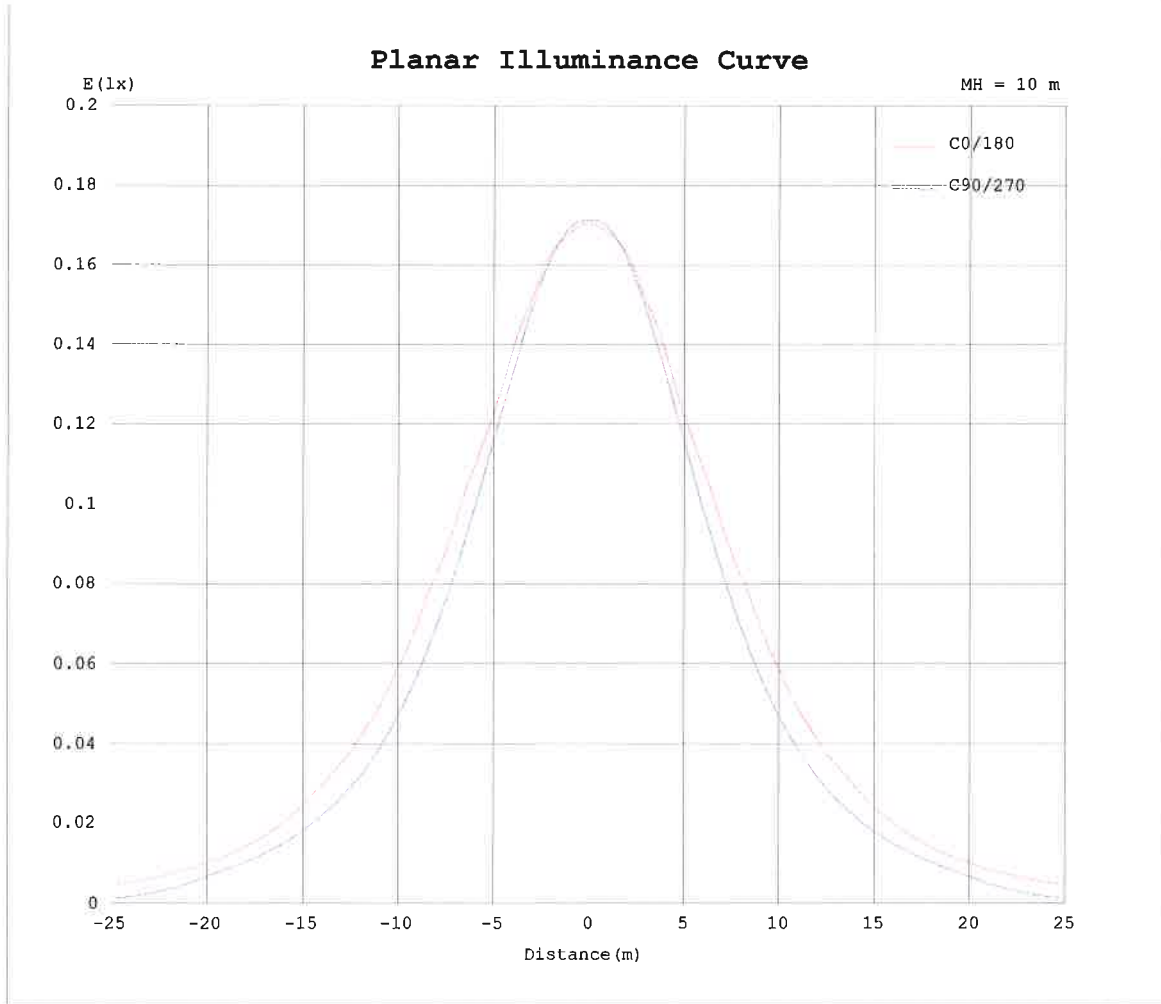
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2.3 Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)



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2.4 Mavi Renk Spektrokolorimetrik Deney Sonuçları (Spectrocolorimetric Test Results of the Blue color**Elektriksel Ölçümler**

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,262
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1513
Güç Faktörü (PF) (Power Factor)	-
Ölçülen Frekans (Hz) (Input Frequency)	-
Ortam Sıcaklığı / Bağlı Nem (Ambient Temperature / Relative Humidity)	25,1 °C 48% Rh
Stabilizasyon Süresi (Stabilization Time)	60 dk ±5dk

Spektrokolorimetrik Ölçüm Sonuçları

(Spectrocolorimetric Measurement Results)

Chrom x	0,1286
Chrom y	0,0935
Duv	0,00
Chrom u'	0,1331
Chrom v'	0,2178
Peak	469 nm
Dominant	474 nm
CCT	0 K
Nominal CCT	-
Ra(CRI)	0
R9	0
S/P Ratio	12,6
Preburning time	1 hr
Test Configuration	4π



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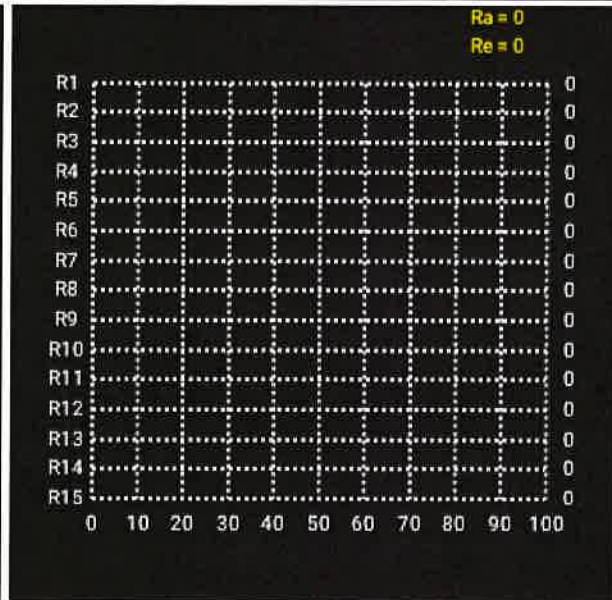
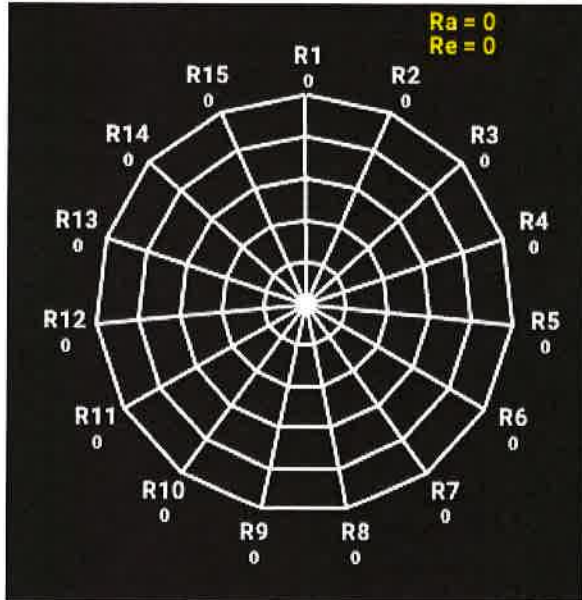
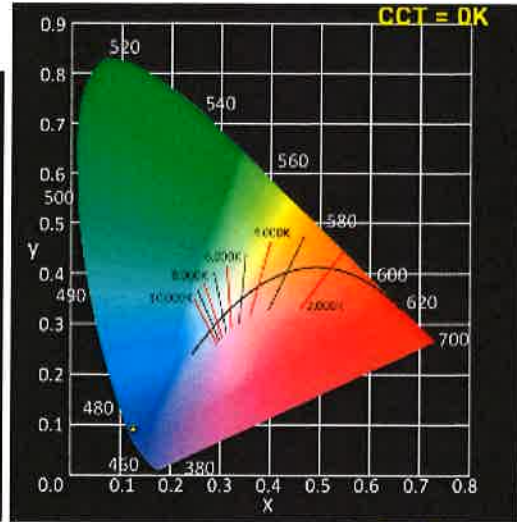
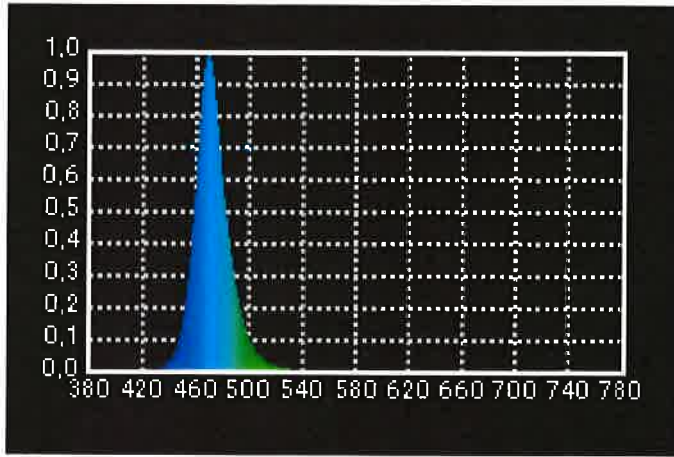
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2.4

Mavi Renk Spektrokolorimetrik Deney Sonuçları (Spectrocolorimetric Test Results of the Blue color)



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2.5 RGB Renk Deney Sonuçları (Test Results of the RGB Color)

Elektriksel Ölçümler
(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	15,36
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,332
Güç Faktörü (PF) (Power Factor)	-
Ölçülen Frekans (Hz) (Input Frequency)	-
Ortam Sıcaklığı / Bağıl Nem (Ambient Temperature / Relative Humidity)	25 °C 50% Rh
Stabilizasyon Süresi (Stabilization Time)	30 dk ±5dk

Fotometrik Ölçüm Sonuçları
(Photometric Measurement Results)

Toplam Işık Akısı (Total Luminous Flux) (lm)	367,74
Maksimum Işık Şiddeti (Max. Light Intensity) (cd)	117,8
Armatür Etkinliği (Luminaire Efficacy) (lm/W)	23,94



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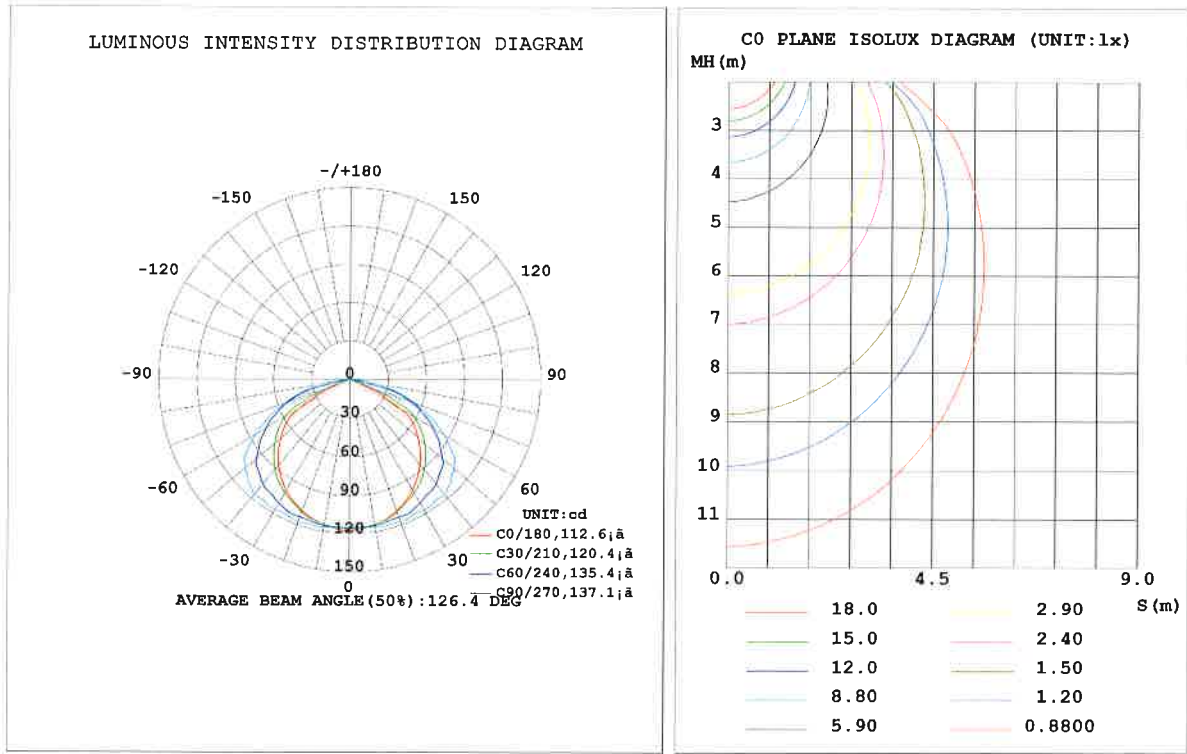
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2.5 RGB renk Fotometrik Deney Sonuçları (Photometric Test Results of the RGB color)



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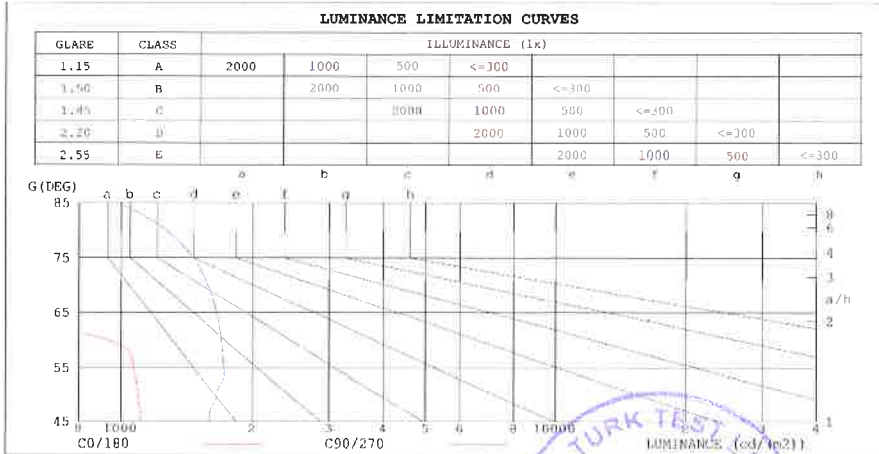
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2.5 RGB renk Fotometrik Deney Sonuçları (Photometric Test Results of the RGB color)

**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
5	116.8	115.6	115.9	115.6	116.8	115.6	115.9	115.6	0- 5	2.776	2.776	0.75, 0.75
10	114.9	115.0	116.9	115.0	114.9	115.0	116.9	115.0	5- 10	8.277	11.05	3.01, 3.01
15	112.2	113.4	117.3	113.4	112.2	113.4	117.3	113.4	10- 15	13.62	24.67	6.71, 6.71
20	108.7	110.9	117.6	110.9	108.7	110.9	117.6	110.9	15- 20	18.62	43.29	11.8, 11.8
25	104.2	109.3	116.2	109.3	104.2	109.3	116.2	109.3	20- 25	23.31	66.60	18.1, 18.1
30	99.11	106.7	116.8	106.7	99.11	106.7	116.8	106.7	25- 30	27.41	94.01	25.6, 25.6
35	93.09	102.8	115.8	102.8	93.09	102.8	115.8	102.8	30- 35	30.98	125.0	34, 34
40	86.28	97.77	116.5	97.77	86.28	97.77	116.5	97.77	35- 40	33.79	158.8	43.2, 43.2
45	78.68	92.20	112.7	92.20	78.68	92.20	112.7	92.20	40- 45	35.75	194.5	52.9, 52.9
50	70.37	85.09	106.8	85.09	70.37	85.09	106.8	85.09	45- 50	36.43	231.0	62.8, 62.8
55	61.38	76.79	98.82	76.79	61.38	76.79	98.82	76.79	50- 55	35.84	266.8	72.6, 72.6
60	46.27	67.37	85.05	67.37	46.27	67.37	85.05	67.37	55- 60	33.76	300.6	81.7, 81.7
65	18.08	55.40	70.06	55.40	18.08	55.40	70.06	55.40	60- 65	28.33	328.9	89.4, 89.4
70	3.120	31.16	54.18	31.16	3.120	31.16	54.18	31.16	65- 70	19.71	348.6	94.8, 94.8
75	0.4403	5.305	37.83	5.305	0.4403	5.305	37.83	5.305	70- 75	11.41	360.0	97.9, 97.9
80	0.3872	0.5581	21.97	0.5581	0.3872	0.5581	21.97	0.5581	75- 80	5.474	365.5	99.4, 99.4
85	0.0868	0.3089	8.597	0.3089	0.0868	0.3089	8.597	0.3089	80- 85	1.925	367.4	99.9, 99.9
90	0	0	0.4018	0	0	0	0.4018	0	85- 90	0.3283	367.7	100, 100
95	0	0	0	0	0	0	0	0	90- 95	0.0015	367.7	100, 100
100	0	0	0	0	0	0	0	0	95-100	0	367.7	100, 100
105	0	0	0	0	0	0	0	0	100-105	0	367.7	100, 100
110	0	0	0	0	0	0	0	0	105-110	0	367.7	100, 100
115	0	0	0	0	0	0	0	0	110-115	0	367.7	100, 100
120	0	0	0	0	0	0	0	0	115-120	0	367.7	100, 100
125	0	0	0	0	0	0	0	0	120-125	0	367.7	100, 100
130	0	0	0	0	0	0	0	0	125-130	0	367.7	100, 100
135	0	0	0	0	0	0	0	0	130-135	0	367.7	100, 100
140	0	0	0	0	0	0	0	0	135-140	0	367.7	100, 100
145	0	0	0	0	0	0	0	0	140-145	0	367.7	100, 100
150	0	0	0	0	0	0	0	0	145-150	0	367.7	100, 100
155	0	0	0	0	0	0	0	0	150-155	0	367.7	100, 100
160	0	0	0	0	0	0	0	0	155-160	0	367.7	100, 100
165	0	0	0	0	0	0	0	0	160-165	0	367.7	100, 100
170	0	0	0	0	0	0	0	0	165-170	0	367.7	100, 100
175	0	0	0	0	0	0	0	0	170-175	0	367.7	100, 100
180	0	0	0	0	0	0	0	0	175-180	0	367.7	100, 100
DEG	LUMINOUS INTENSITY:cd								UNIT:lm			



LUMINANCE cd/(m2)

G (DEG)	C0/180	C90/270
85	10	986
80	22	1265
75	17	1461
70	91	1584
65	428	1658
60	925	1701
55	1070	1723
50	1095	1662
45	1113	1594

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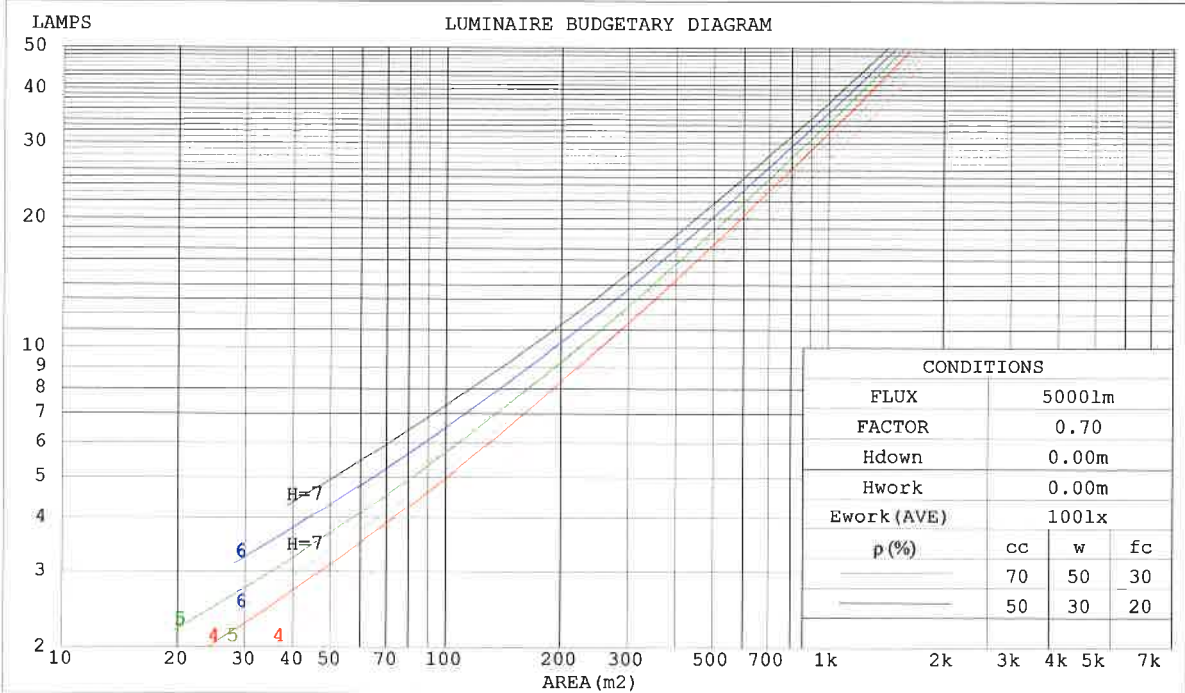
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ÖLÇÜM RAPORU
MEASUREMENT REPORT

2.5 RGB renk Fotometrik Deneş Sonuřları (Photometric Test Results of the RGB color)

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pf _c	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	1.05	1.01	.97	1.03	.99	.96	.98	.95	.93	.94	.92	.90	.91	.89	.87	.85
2.0	.91	.85	.79	.90	.83	.78	.86	.81	.76	.83	.78	.75	.80	.76	.73	.71
3.0	.80	.72	.66	.79	.71	.65	.76	.69	.64	.73	.67	.63	.70	.66	.62	.59
4.0	.71	.62	.55	.69	.61	.55	.67	.60	.54	.65	.58	.53	.62	.57	.53	.50
5.0	.63	.54	.47	.62	.53	.47	.60	.52	.46	.58	.51	.46	.56	.50	.45	.43
6.0	.56	.47	.41	.55	.47	.41	.54	.46	.40	.52	.45	.40	.50	.44	.40	.37
7.0	.51	.42	.36	.50	.42	.36	.48	.41	.35	.47	.40	.35	.46	.40	.35	.33
8.0	.46	.38	.32	.46	.37	.32	.44	.37	.31	.43	.36	.31	.42	.36	.31	.29
9.0	.42	.34	.28	.42	.34	.28	.41	.33	.28	.39	.33	.28	.38	.32	.28	.26
10.0	.39	.31	.26	.38	.31	.26	.37	.30	.25	.36	.30	.25	.36	.29	.25	.23



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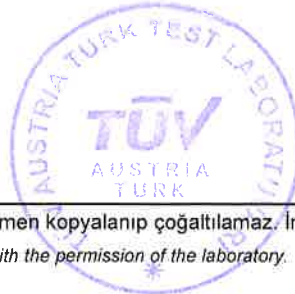
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2.5 RGB renk Fotometrik Deney Sonuçları (Photometric Test Results of the RGB color)

WEC AND CCEC

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)									
0.0																
1.0	.291	.165	.052	.284	.162	.051	.271	.155	.050	.259	.149	.048	.247	.143	.046	
2.0	.282	.155	.047	.276	.152	.047	.264	.147	.046	.253	.142	.045	.244	.138	.043	
3.0	.265	.141	.042	.260	.139	.042	.249	.135	.041	.240	.131	.040	.231	.128	.040	
4.0	.247	.128	.038	.242	.127	.037	.233	.124	.037	.225	.121	.036	.217	.118	.036	
5.0	.230	.117	.034	.226	.116	.034	.217	.113	.033	.210	.111	.033	.203	.108	.033	
6.0	.214	.107	.031	.210	.106	.031	.203	.104	.030	.196	.102	.030	.190	.100	.030	
7.0	.200	.099	.028	.196	.098	.028	.190	.096	.028	.184	.094	.027	.178	.092	.027	
8.0	.187	.091	.026	.184	.090	.026	.178	.089	.025	.172	.087	.025	.167	.086	.025	
9.0	.175	.085	.024	.172	.084	.024	.167	.083	.023	.162	.081	.023	.158	.080	.023	
10.0	.165	.079	.022	.162	.078	.022	.158	.077	.022	.153	.076	.022	.149	.075	.022	

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	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	.179	.156	.136	.153	.134	.117	.105	.092	.081	.060	.053	.047	.019	.017	.015	
2.0	.171	.132	.099	.146	.114	.086	.100	.079	.060	.058	.046	.035	.019	.015	.011	
3.0	.164	.114	.075	.140	.099	.065	.096	.068	.046	.056	.040	.027	.018	.013	.009	
4.0	.156	.101	.059	.134	.087	.051	.092	.061	.036	.053	.036	.021	.017	.012	.007	
5.0	.149	.091	.047	.128	.078	.041	.088	.055	.029	.051	.032	.017	.016	.010	.006	
6.0	.142	.082	.039	.122	.071	.034	.084	.050	.024	.049	.029	.014	.016	.010	.005	
7.0	.136	.075	.033	.117	.065	.029	.081	.046	.020	.047	.027	.012	.015	.009	.004	
8.0	.129	.070	.029	.111	.060	.025	.077	.042	.018	.045	.025	.011	.015	.008	.003	
9.0	.123	.065	.025	.106	.056	.022	.074	.039	.016	.043	.023	.009	.014	.008	.003	
10.0	.118	.060	.022	.102	.052	.019	.070	.037	.014	.041	.022	.008	.013	.007	.003	



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2.5 RGB renk Fotometrik Deney Sonuçları (Photometric Test Results of the RGB color)

Uncorrected UGR Table

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	12.8	14.4	13.1	14.6	14.8	15.6	17.1	15.9	17.3	17.5
3H	12.8	14.2	13.1	14.5	14.7	17.4	18.8	17.7	19.0	19.3
4H	12.7	14.0	13.0	14.3	14.5	18.1	19.4	18.4	19.7	19.9
6H	12.6	13.8	12.9	14.1	14.4	18.6	19.8	18.9	20.1	20.4
8H	12.5	13.8	12.9	14.0	14.3	18.7	19.9	19.0	20.2	20.5
12H	12.5	13.7	12.8	13.9	14.2	18.7	19.9	19.1	20.2	20.5
4H 2H	13.9	15.2	14.2	15.4	15.7	16.0	17.3	16.3	17.6	17.8
3H	13.9	15.0	14.2	15.3	15.6	18.0	19.2	18.4	19.5	19.8
4H	13.8	14.8	14.1	15.1	15.5	18.8	19.9	19.2	20.2	20.5
6H	13.7	14.6	14.1	15.0	15.3	19.4	20.4	19.8	20.7	21.1
8H	13.6	14.5	14.0	14.9	15.2	19.6	20.5	20.0	20.8	21.2
12H	13.6	14.4	14.0	14.8	15.2	19.7	20.5	20.1	20.9	21.3
8H 4H	14.0	14.9	14.5	15.3	15.7	18.7	19.6	19.1	20.0	20.3
6H	14.0	14.7	14.4	15.1	15.5	19.4	20.1	19.8	20.5	20.9
8H	13.9	14.6	14.4	15.0	15.4	19.6	20.2	20.0	20.6	21.1
12H	13.9	14.4	14.4	14.9	15.3	19.7	20.2	20.2	20.7	21.1
12H 4H	14.0	14.8	14.5	15.2	15.6	18.7	19.5	19.1	19.9	20.3
6H	14.0	14.6	14.4	15.0	15.5	19.3	19.9	19.8	20.4	20.8
8H	13.9	14.5	14.4	14.9	15.4	19.5	20.1	20.0	20.5	21.0
Variations with the observer position at spacings:										
S = 1.0H	+ 0.4 / - 0.4					+ 0.2 / - 0.2				
1.5H	+ 1.0 / - 1.3					+ 0.2 / - 0.2				
2.0H	+ 0.7 / - 1.2					+ 0.2 / - 0.5				

CIE Pub.117 Corrected 367.7 lm Total Lamp Luminous Flux. (8log(F/F0) = -3.5)



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2.5 RGB renk Fotometrik Deneş Sonuřları (Photometric Test Results of the RGB color)**UTILIZATION FACTORS TABLE**

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) $k(RI) \times RCR = 5$									
$k = 0.60$	56	44	37	55	44	37	54	44	37	30
0.80	67	55	47	66	55	47	64	54	47	40
1.00	76	65	57	75	64	57	72	65	57	49
1.25	83	73	66	82	72	65	79	71	65	57
1.50	88	79	72	87	78	71	84	76	70	63
2.00	96	87	81	94	86	80	90	84	79	71
2.50	100	92	86	98	91	85	94	88	83	75
3.00	103	96	91	101	95	90	97	92	88	79
4.00	107	101	97	105	100	96	100	96	93	84
5.00	109	105	101	107	103	99	102	99	96	87
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			



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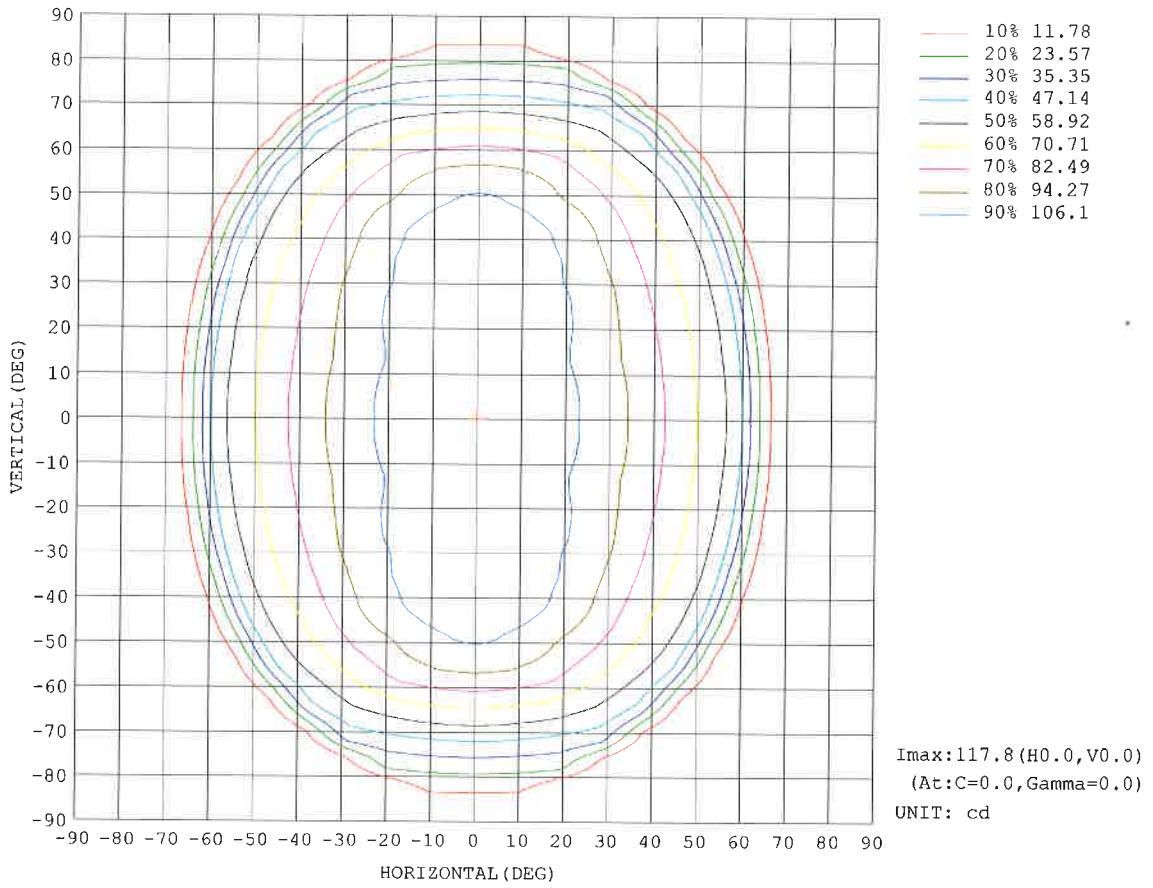
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2.5

RGB renk Fotometrik Deneý Sonuçları (Photometric Test Results of the RGB color)

ISOCANDELA DIAGRAM



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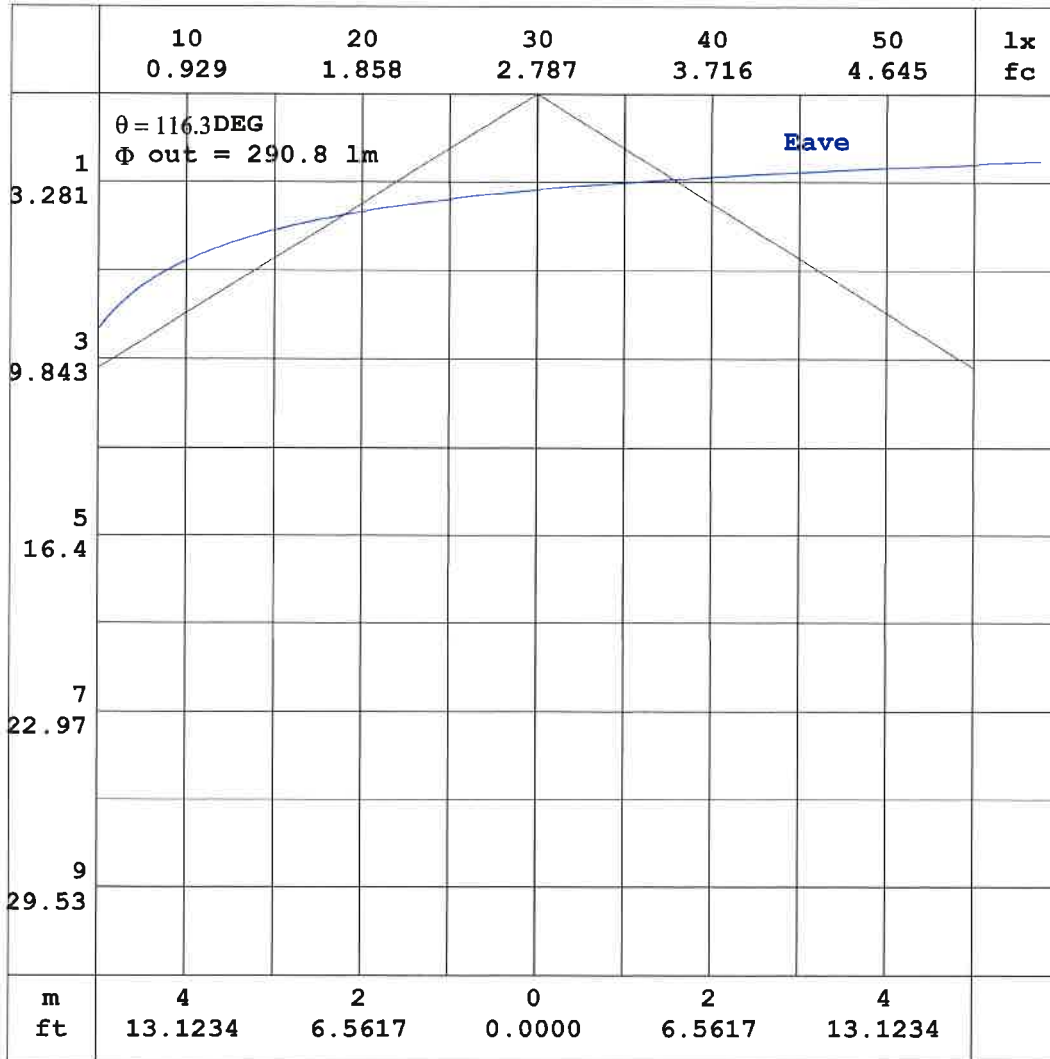
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2.5 RGB renk Fotometrik Deney Sonuçları (Photometric Test Results of the RGB color)**AAI CURVES**

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

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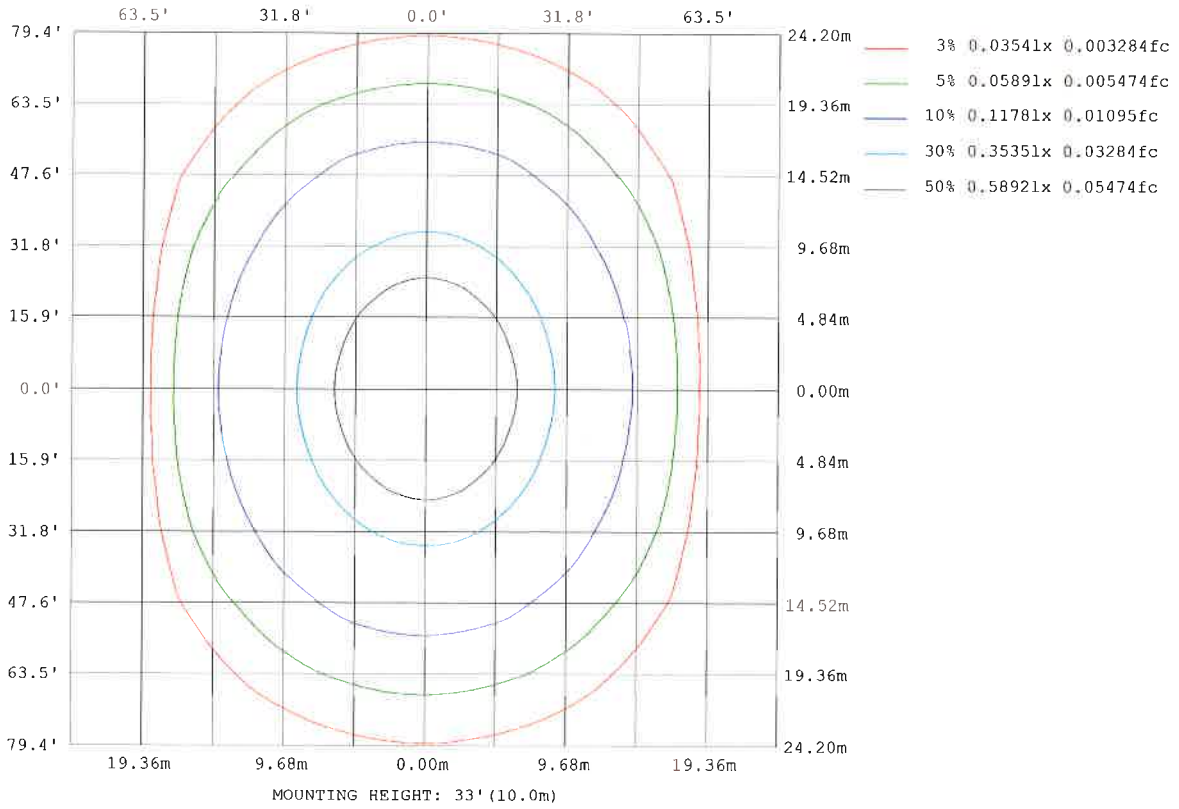
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2.5 RGB renk Fotometrik Deney Sonuçları (Photometric Test Results of the RGB color)

ISOLUX DIAGRAM



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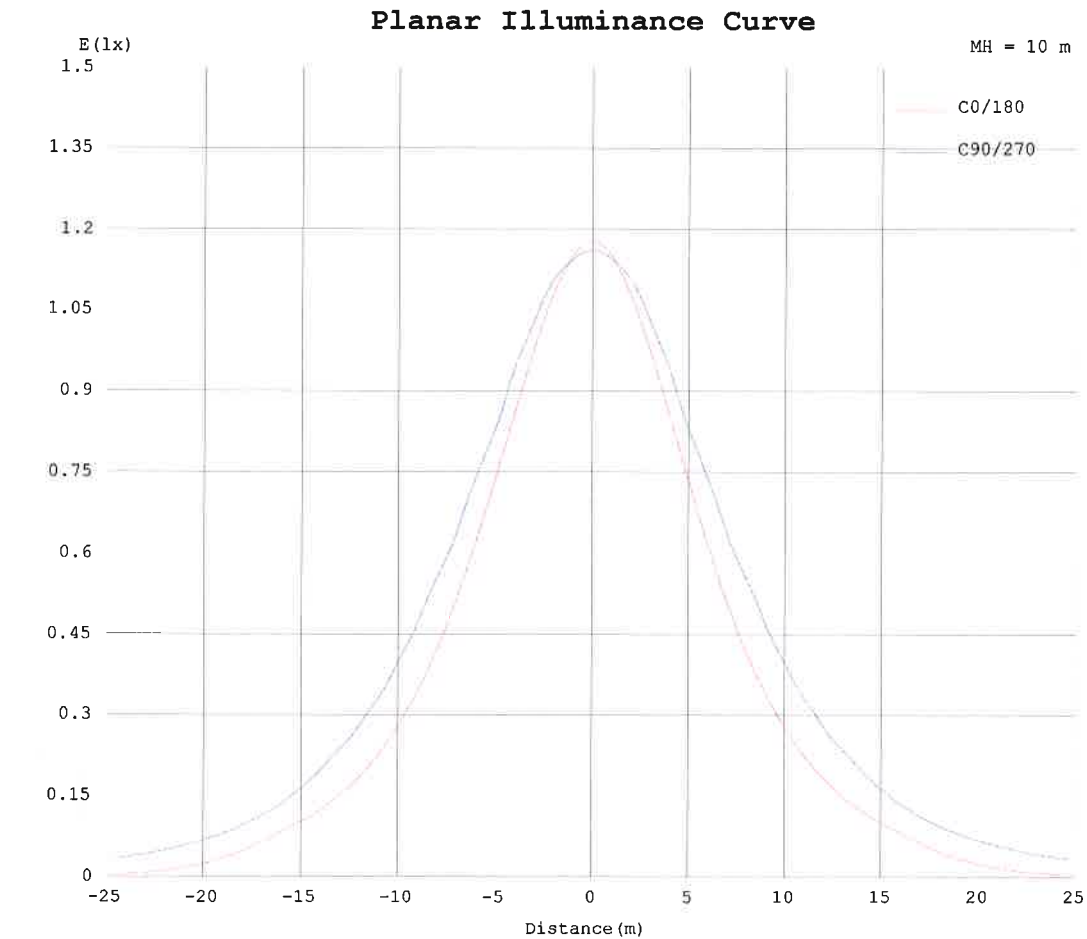
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2.5 RGB renk Fotometrik Deneş Sonuları (Photometric Test Results of the RGB color)



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2.6 RGB Renk Spektrokolorimetrik Deney Sonuçları (Spectrocolorimetric Test Results of the RGB color)**Elektriksel Ölçümler**

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	15,36
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,32
Güç Faktörü (PF) (Power Factor)	-
Ölçülen Frekans (Hz) (Input Frequency)	-
Ortam Sıcaklığı / Bağıl Nem (Ambient Temperature / Relative Humidity)	25 °C 50% Rh
Stabilizasyon Süresi (Stabilization Time)	30 dk ±5dk

Spektrokolorimetrik Ölçüm Sonuçları

(Spectrocolorimetric Measurement Results)

Chrom x	0.2446
Chrom y	0.3007
Duv	0.0286
Chrom u'	0.1599
Chrom v'	0.4423
Peak	470 nm
Dominant	487 nm
CCT	Not applicable
Nominal CCT	4000 K
Ra(CRI)	64
R9	-104
S/P Ratio	3,9
Preburning time	1 hr
Test Configuration	4π



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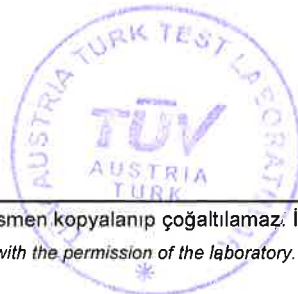
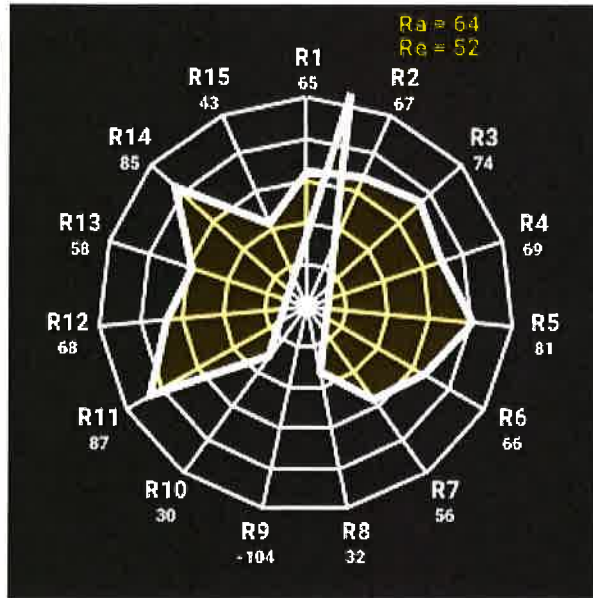
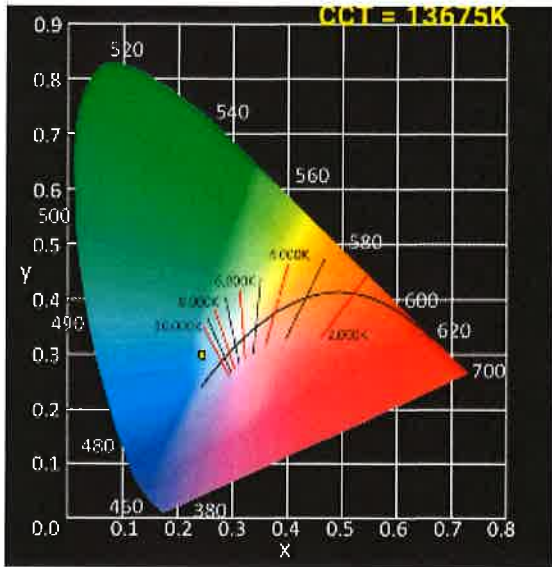
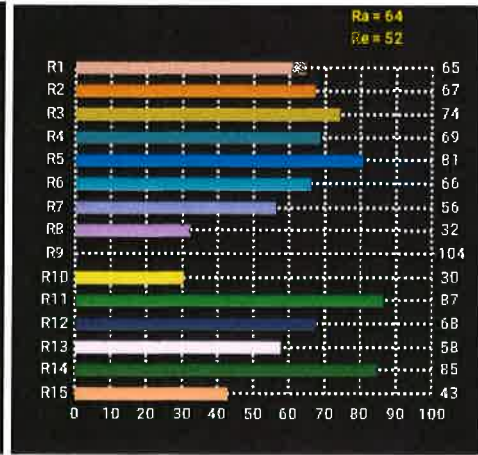
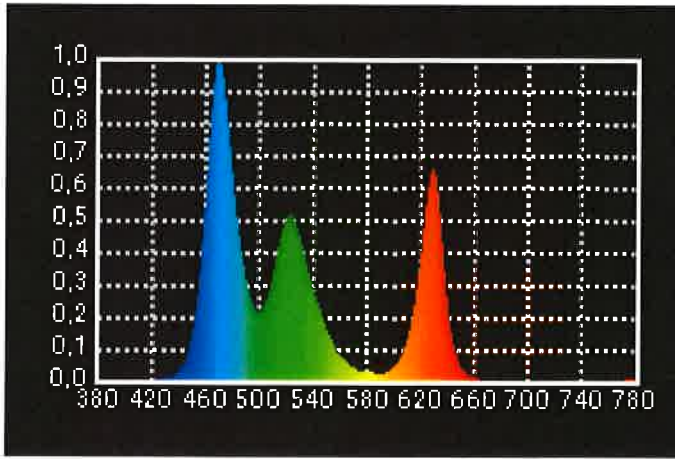
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2.6

RGB Renk Spektrokolorimetrik Deney Sonuçları (Spectrocolorimetric Test Results of the RGB color)



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2.7 Yeşil Renk Deney Sonuçları (Test Results of the Green Color)

Elektriksel Ölçümler
(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,25
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1511
Güç Faktörü (PF) (Power Factor)	-
Ölçülen Frekans (Hz) (Input Frequency)	-
Ortam Sıcaklığı / Bağıl Nem (Ambient Temperature / Relative Humidity)	25,1 °C 48% Rh
Stabilizasyon Süresi (Stabilization Time)	60 dk ±5dk

Fotometrik Ölçüm Sonuçları
(Photometric Measurement Results)

Toplam Işık Akısı (Total Luminous Flux) (lm)	248,94
Maksimum Işık Şiddeti (Max. Light Intensity) (cd)	77,07
Armatür Etkinliği (Luminaire Efficacy) (lm/W)	34,34



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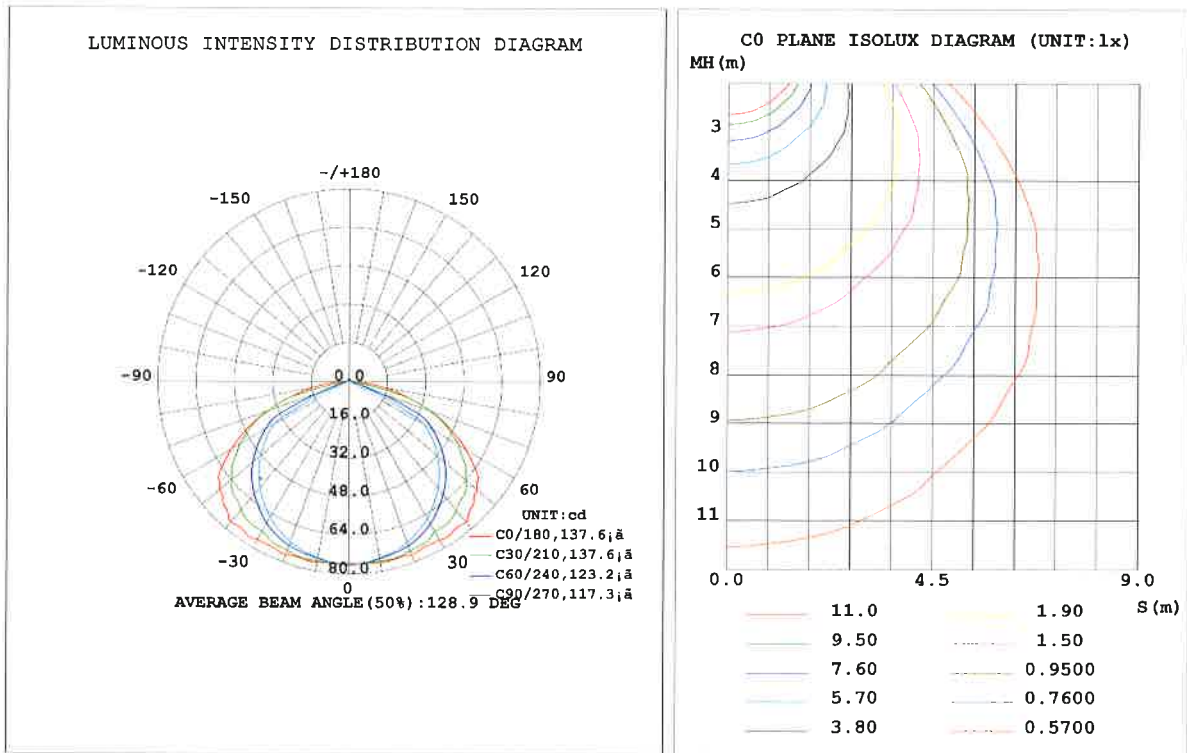
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2.7 Yeşil renk Fotometrik Deneş Sonuřları (Photometric Test Results of the Green color)



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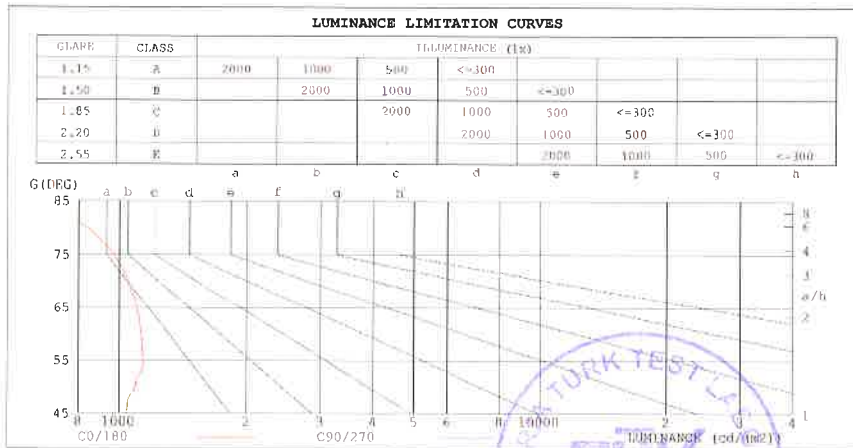
2.7

Yeşil renk Fotometrik Deney Sonuçları (Photometric Test Results of the Green color)

ZONAL FLUX DIAGRAM
AND LUMINANCE LIMITATION CURVES

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	llum, lamp
5	75.90	75.97	75.82	75.97	75.90	75.97	75.82	75.97	0- 5	1.820	1.820	0.73,0.73
10	76.50	75.52	74.81	75.52	76.50	75.52	74.81	75.52	5- 10	5.421	7.241	2.91,2.91
15	76.51	75.14	73.31	75.14	76.51	75.14	73.31	75.14	10- 15	8.943	16.18	6.5,6.5
20	76.91	74.21	71.29	74.21	76.91	74.21	71.29	74.21	15- 20	12.29	28.47	11.4,11.4
25	75.95	72.43	68.77	72.43	75.95	72.43	68.77	72.43	20- 25	15.37	43.84	17.6,17.6
30	76.34	70.41	65.73	70.41	76.34	70.41	65.73	70.41	25- 30	18.11	61.95	24.9,24.9
35	76.32	67.84	62.15	67.84	76.32	67.84	62.15	67.84	30- 35	20.56	82.51	33.1,33.1
40	76.63	65.21	58.04	65.21	76.63	65.21	58.04	65.21	35- 40	22.51	105.0	42.2,42.2
45	73.56	61.65	53.38	61.65	73.56	61.65	53.38	61.65	40- 45	23.90	128.9	51.8,51.8
50	70.27	57.45	48.23	57.45	70.27	57.45	48.23	57.45	45- 50	24.51	153.4	61.6,61.6
55	65.42	52.67	42.56	52.67	65.42	52.67	42.56	52.67	50- 55	24.33	177.8	71.4,71.4
60	56.41	46.21	36.14	46.21	56.41	46.21	36.14	46.21	55- 60	23.12	200.9	80.7,80.7
65	46.54	39.06	16.89	39.06	46.54	39.06	16.89	39.06	60- 65	20.18	221.1	88.9,88.9
70	35.98	25.40	1.798	25.40	35.98	25.40	1.798	25.40	65- 70	14.40	235.5	94.6,94.6
75	25.10	4.277	0.2852	4.277	25.10	4.277	0.2852	4.277	70- 75	8.125	243.6	97.8,97.8
80	14.52	0.3626	0.3098	0.3626	14.52	0.3626	0.3098	0.3626	75- 80	3.809	247.4	99.4,99.4
85	5.618	0.3014	0.1170	0.3014	5.618	0.3014	0.1170	0.3014	80- 85	1.324	248.7	99.9,99.9
90	0.2017	0	0	0	0.2017	0	0	0	85- 90	0.2282	248.9	100,100
95	0	0	0	0	0	0	0	0	90- 95	0.0008	248.9	100,100
100	0	0	0	0	0	0	0	0	95-100	0	248.9	100,100
105	0	0	0	0	0	0	0	0	100-105	0.0001	248.9	100,100
110	0	0	0	0	0	0	0	0	105-110	0.0000	248.9	100,100
115	0	0	0	0	0	0	0	0	110-115	0	248.9	100,100
120	0	0	0	0	0	0	0	0	115-120	0	248.9	100,100
125	0	0	0	0	0	0	0	0	120-125	0	248.9	100,100
130	0	0	0	0	0	0	0	0	125-130	0	248.9	100,100
135	0	0	0	0	0	0	0	0	130-135	0	248.9	100,100
140	0	0	0	0	0	0	0	0	135-140	0	248.9	100,100
145	0	0	0	0	0	0	0	0	140-145	0	248.9	100,100
150	0	0	0	0	0	0	0	0	145-150	0	248.9	100,100
155	0	0	0	0	0	0	0	0	150-155	0	248.9	100,100
160	0	0	0	0	0	0	0	0	155-160	0	248.9	100,100
165	0	0	0	0	0	0	0	0	160-165	0	248.9	100,100
170	0	0	0	0	0	0	0	0	165-170	0	248.9	100,100
175	0	0	0	0	0	0	0	0	170-175	0	248.9	100,100
180	0	0	0	0	0	0	0	0	175-180	0	248.9	100,100
DEG	LUMINOUS INTENSITY:cd								UNIT:lm			



LUMINANCE cd/ (m2)

G (DEG)	C0/180	C90/270
85	645	13
80	836	18
75	970	11
70	1052	53
65	1101	400
60	1128	723
55	1140	742
50	1093	750
45	1040	755

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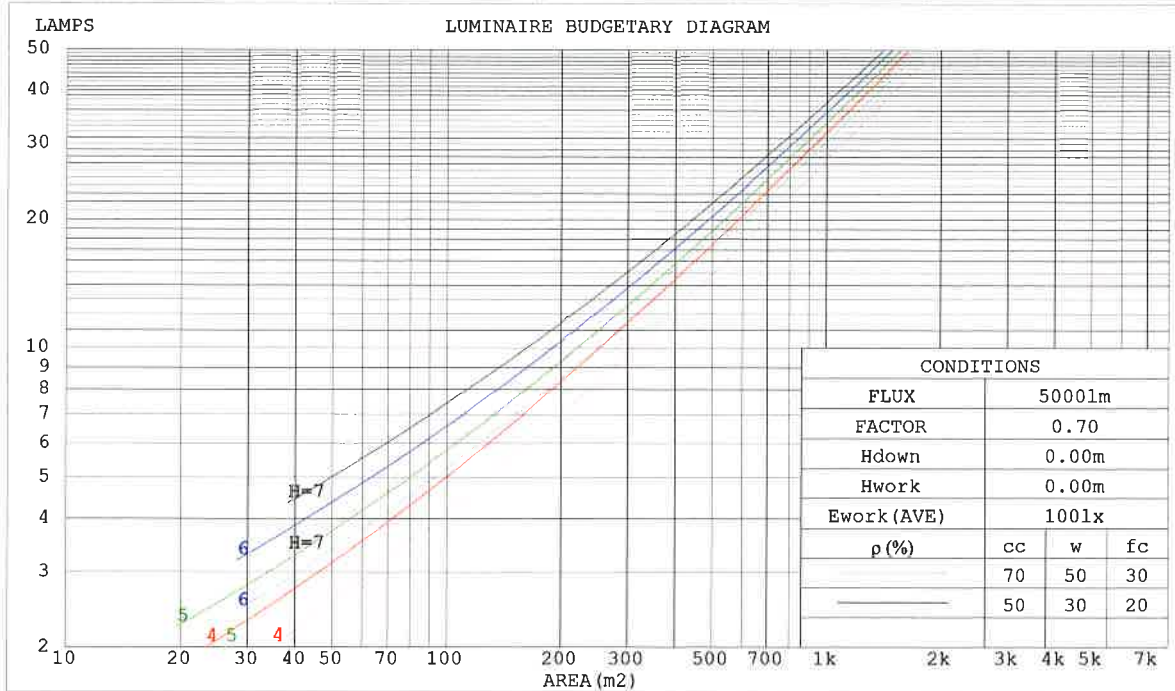
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2.7 Yeşil renk Fotometrik Deney Sonuçları (Photometric Test Results of the Green color)

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

pcc	80%			70%			50%			30%			10%			0
	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pw																
pfc																
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	1.05	1.01	.97	1.02	.99	.95	.98	.95	.92	.94	.92	.89	.91	.89	.87	.85
2.0	.91	.84	.79	.89	.83	.78	.86	.80	.76	.82	.78	.74	.79	.76	.73	.70
3.0	.80	.72	.65	.78	.71	.64	.75	.69	.63	.72	.67	.62	.70	.65	.61	.59
4.0	.70	.61	.55	.69	.61	.54	.66	.59	.53	.64	.58	.53	.62	.56	.52	.50
5.0	.62	.53	.47	.61	.53	.46	.59	.52	.46	.57	.50	.45	.55	.49	.45	.43
6.0	.56	.47	.40	.55	.46	.40	.53	.45	.40	.51	.45	.39	.50	.44	.39	.37
7.0	.50	.41	.35	.50	.41	.35	.48	.40	.35	.47	.40	.35	.45	.39	.34	.32
8.0	.46	.37	.31	.45	.37	.31	.44	.36	.31	.42	.36	.31	.41	.35	.30	.29
9.0	.42	.33	.28	.41	.33	.28	.40	.33	.28	.39	.32	.27	.38	.32	.27	.25
10.0	.38	.30	.25	.38	.30	.25	.37	.30	.25	.36	.29	.25	.35	.29	.25	.23



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2.7 Yeşil renk Fotometrik Deney Sonuçları (Photometric Test Results of the Green color)

WEC AND CCEC

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pf _c	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients (WEC)									
0.0																
1.0	.294	.167	.053	.287	.164	.052	.274	.157	.050	.262	.151	.049	.251	.145	.047	
2.0	.285	.156	.048	.279	.154	.047	.267	.149	.046	.257	.144	.045	.247	.140	.044	
3.0	.268	.143	.043	.263	.141	.042	.252	.137	.042	.243	.133	.041	.234	.129	.040	
4.0	.250	.130	.038	.245	.128	.038	.235	.125	.037	.227	.122	.037	.219	.119	.036	
5.0	.232	.118	.034	.228	.117	.034	.219	.114	.034	.212	.112	.033	.205	.109	.033	
6.0	.216	.108	.031	.212	.107	.031	.205	.105	.030	.198	.103	.030	.191	.101	.030	
7.0	.201	.099	.028	.198	.098	.028	.191	.097	.028	.185	.095	.028	.179	.093	.027	
8.0	.188	.092	.026	.185	.091	.026	.179	.089	.026	.174	.088	.025	.168	.086	.025	
9.0	.176	.085	.024	.173	.085	.024	.168	.083	.024	.163	.082	.023	.159	.081	.023	
10.0	.166	.079	.022	.163	.079	.022	.158	.078	.022	.154	.076	.022	.150	.075	.022	

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pf _c	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	.179	.156	.136	.153	.134	.117	.105	.092	.081	.060	.053	.047	.019	.017	.015	
2.0	.171	.132	.099	.147	.114	.085	.101	.079	.060	.058	.046	.035	.019	.015	.011	
3.0	.164	.114	.075	.141	.099	.065	.097	.068	.045	.056	.040	.027	.018	.013	.009	
4.0	.157	.101	.058	.135	.087	.051	.093	.061	.036	.054	.036	.021	.017	.012	.007	
5.0	.150	.091	.047	.129	.078	.041	.089	.055	.029	.051	.032	.017	.017	.010	.006	
6.0	.143	.082	.039	.123	.071	.034	.085	.050	.024	.049	.029	.014	.016	.010	.005	
7.0	.136	.075	.033	.117	.065	.029	.081	.046	.020	.047	.027	.012	.015	.009	.004	
8.0	.130	.070	.028	.112	.060	.025	.077	.042	.018	.045	.025	.010	.015	.008	.003	
9.0	.124	.065	.025	.107	.056	.022	.074	.040	.015	.043	.023	.009	.014	.008	.003	
10.0	.118	.061	.022	.102	.053	.019	.071	.037	.014	.041	.022	.008	.013	.007	.003	



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Yeşil renk Fotometrik Deney Sonuçları (Photometric Test Results of the Green color)

Uncorrected UGR Table

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	14.2	15.7	14.5	15.9	16.1	11.9	13.4	12.1	13.6	13.8
3H	16.0	17.4	16.3	17.7	17.9	12.0	13.4	12.3	13.6	13.8
4H	16.7	18.0	17.0	18.3	18.5	11.8	13.2	12.2	13.4	13.7
6H	17.2	18.4	17.5	18.7	19.0	11.7	13.0	12.1	13.3	13.5
8H	17.3	18.5	17.6	18.8	19.1	11.7	12.9	12.0	13.2	13.5
12H	17.4	18.5	17.7	18.8	19.1	11.6	12.8	12.0	13.1	13.4
4H 2H	14.7	16.0	15.0	16.3	16.5	12.9	14.2	13.2	14.5	14.7
3H	16.7	17.9	17.1	18.2	18.5	13.0	14.2	13.4	14.5	14.8
4H	17.5	18.6	17.9	18.9	19.3	12.9	14.0	13.3	14.3	14.6
6H	18.1	19.1	18.5	19.4	19.8	12.8	13.8	13.2	14.1	14.5
8H	18.3	19.2	18.7	19.5	19.9	12.8	13.7	13.2	14.0	14.4
12H	18.4	19.2	18.8	19.6	20.0	12.7	13.5	13.2	13.9	14.3
8H 4H	17.5	18.3	17.9	18.7	19.1	13.2	14.1	13.6	14.4	14.8
6H	18.1	18.8	18.5	19.2	19.6	13.1	13.8	13.6	14.2	14.7
8H	18.3	18.9	18.7	19.3	19.8	13.1	13.7	13.5	14.1	14.6
12H	18.4	18.9	18.9	19.4	19.9	13.0	13.6	13.5	14.0	14.5
12H 4H	17.4	18.2	17.8	18.6	19.0	13.2	14.0	13.6	14.4	14.8
6H	18.0	18.7	18.5	19.1	19.6	13.1	13.8	13.6	14.2	14.6
8H	18.2	18.8	18.7	19.2	19.7	13.1	13.6	13.6	14.1	14.5
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.2					+ 0.5 / - 0.7				
1.5H	+ 0.2 / - 0.2					+ 0.8 / - 0.9				
2.0H	+ 0.3 / - 0.6					+ 0.6 / - 1.4				

CIE Pub.117 Corrected 248.9 lm Total Lamp Luminous Flux. (8log(F/F0) = -4.8)



Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz raporlar geçersizdir.

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Yeşil renk Fotometrik Deney Sonuçları (Photometric Test Results of the Green color)**UTILIZATION FACTORS TABLE**

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) $k(RI) \times RCR = 5$									
$k = 0.60$	56	44	37	55	43	36	54	43	36	30
0.80	66	54	47	65	54	47	63	53	46	39
1.00	75	64	57	74	63	56	72	65	56	48
1.25	83	72	65	81	71	65	79	70	64	56
1.50	88	78	71	86	77	71	83	75	69	62
2.00	95	87	80	93	86	80	90	83	78	70
2.50	99	92	86	97	90	85	93	88	83	75
3.00	103	96	91	101	94	90	97	92	87	79
4.00	107	101	97	104	100	95	100	96	93	84
5.00	109	105	101	107	103	99	102	99	96	87
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			



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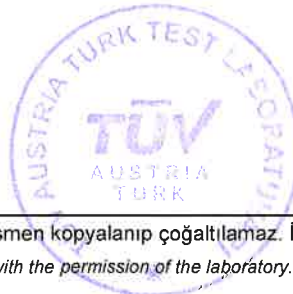
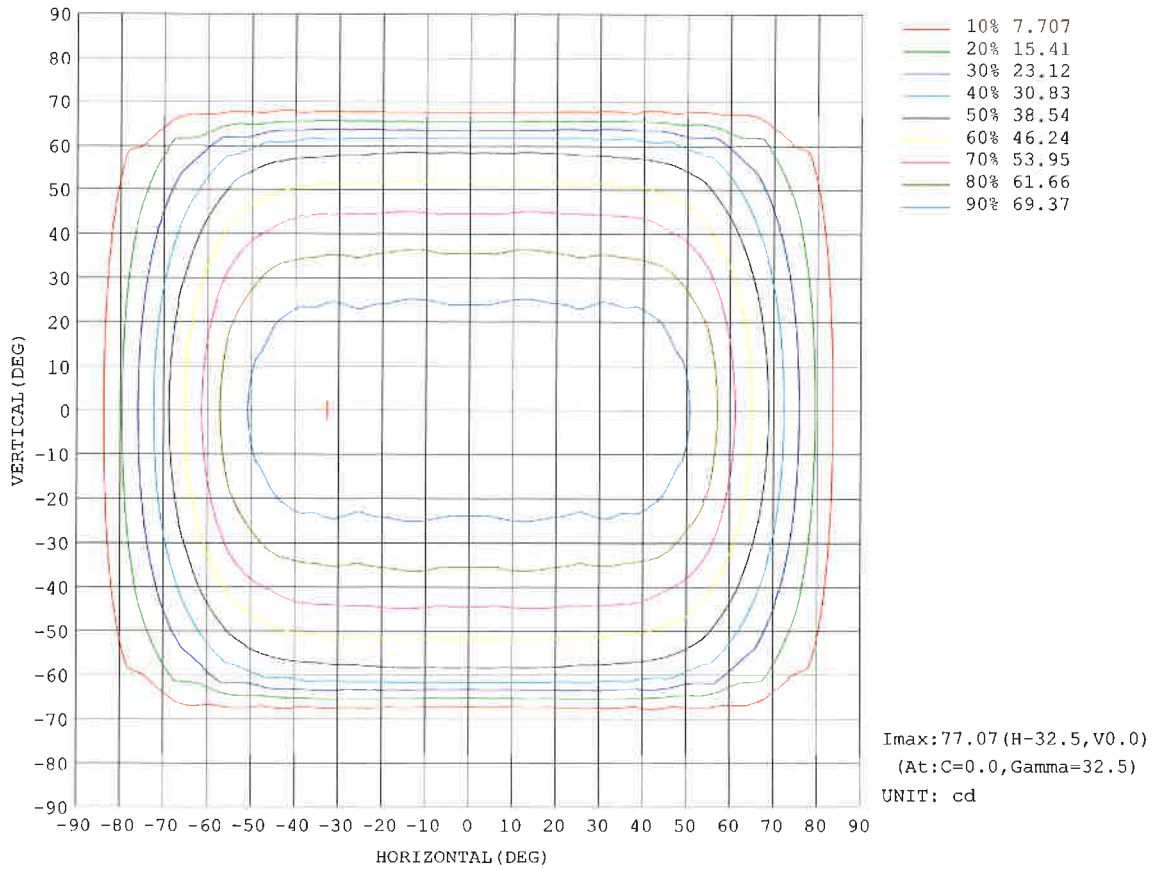
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Yeşil renk Fotometrik Deney Sonuçları (Photometric Test Results of the Green color)

ISOCANDELA DIAGRAM



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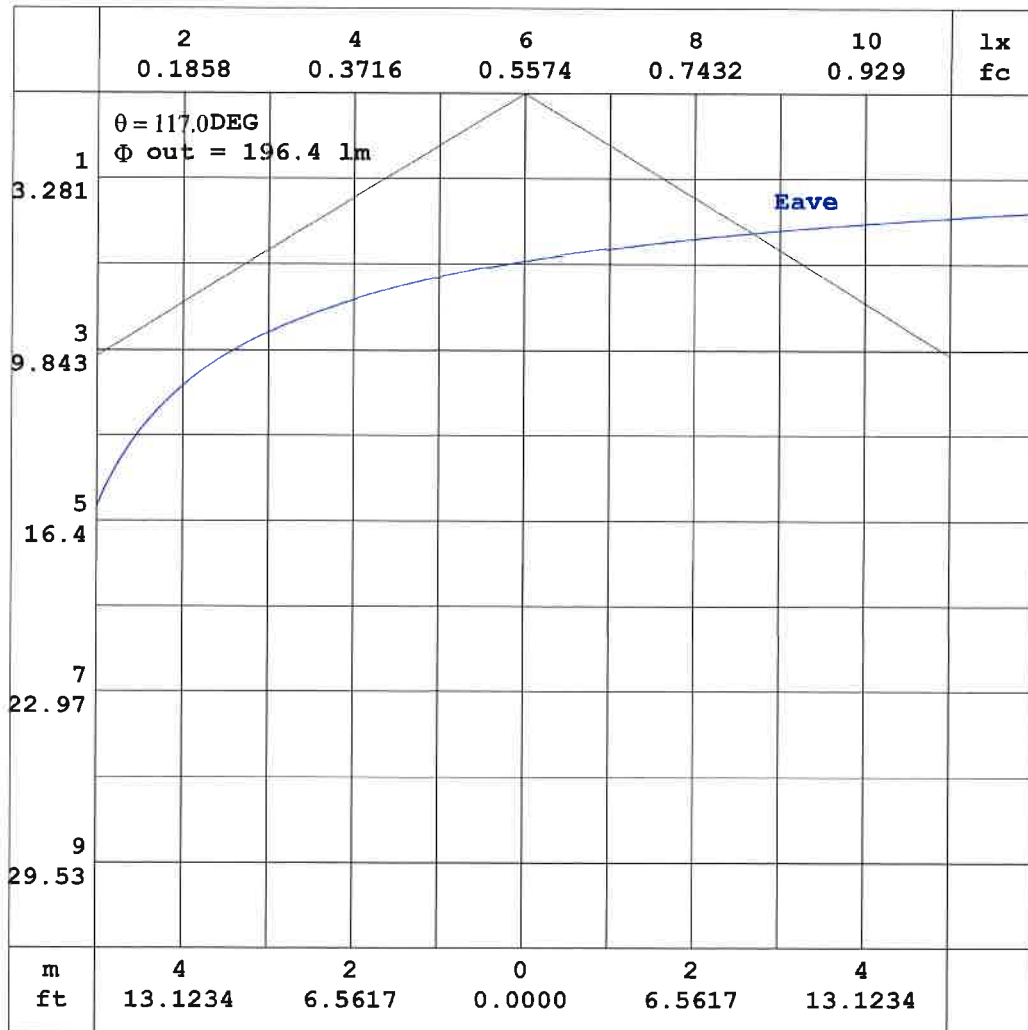
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2.7 Yeşil renk Fotometrik Deney Sonuçları (Photometric Test Results of the Green color)**AAI CURVES**

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

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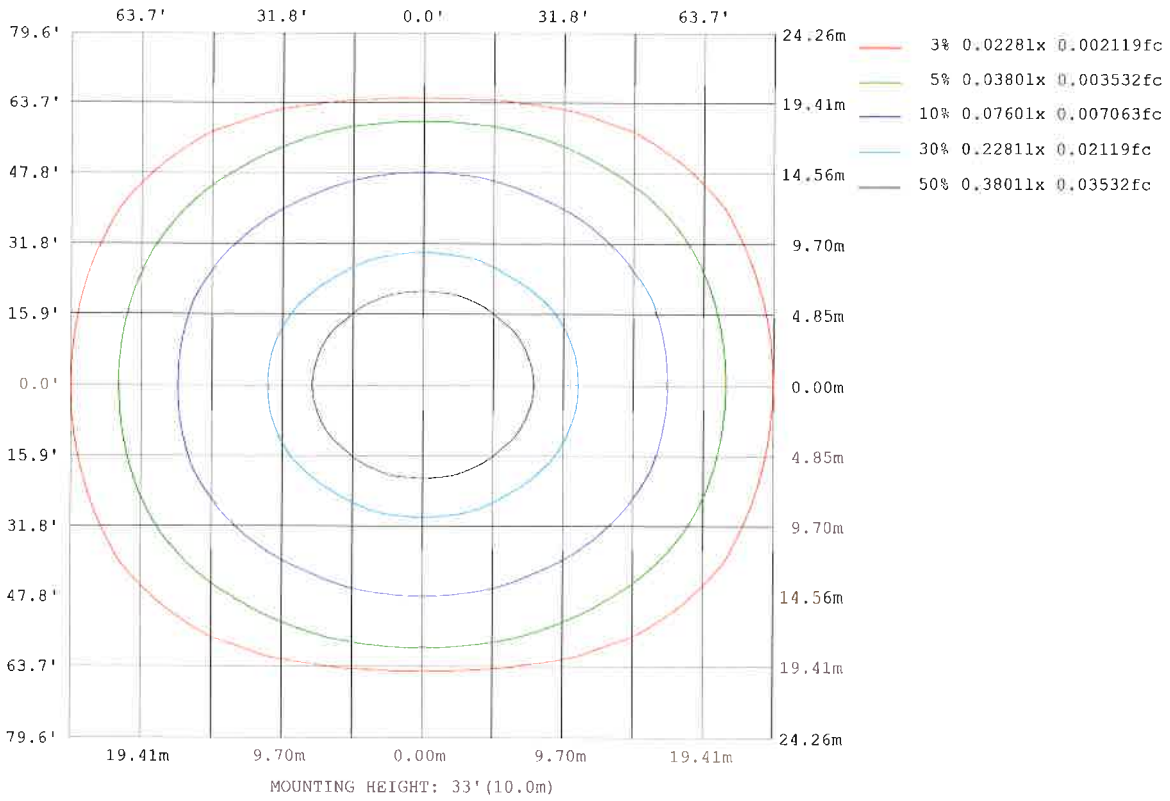
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Yeşil renk Fotometrik Deney Sonuçları (Photometric Test Results of the Green color)

ISOLUX DIAGRAM



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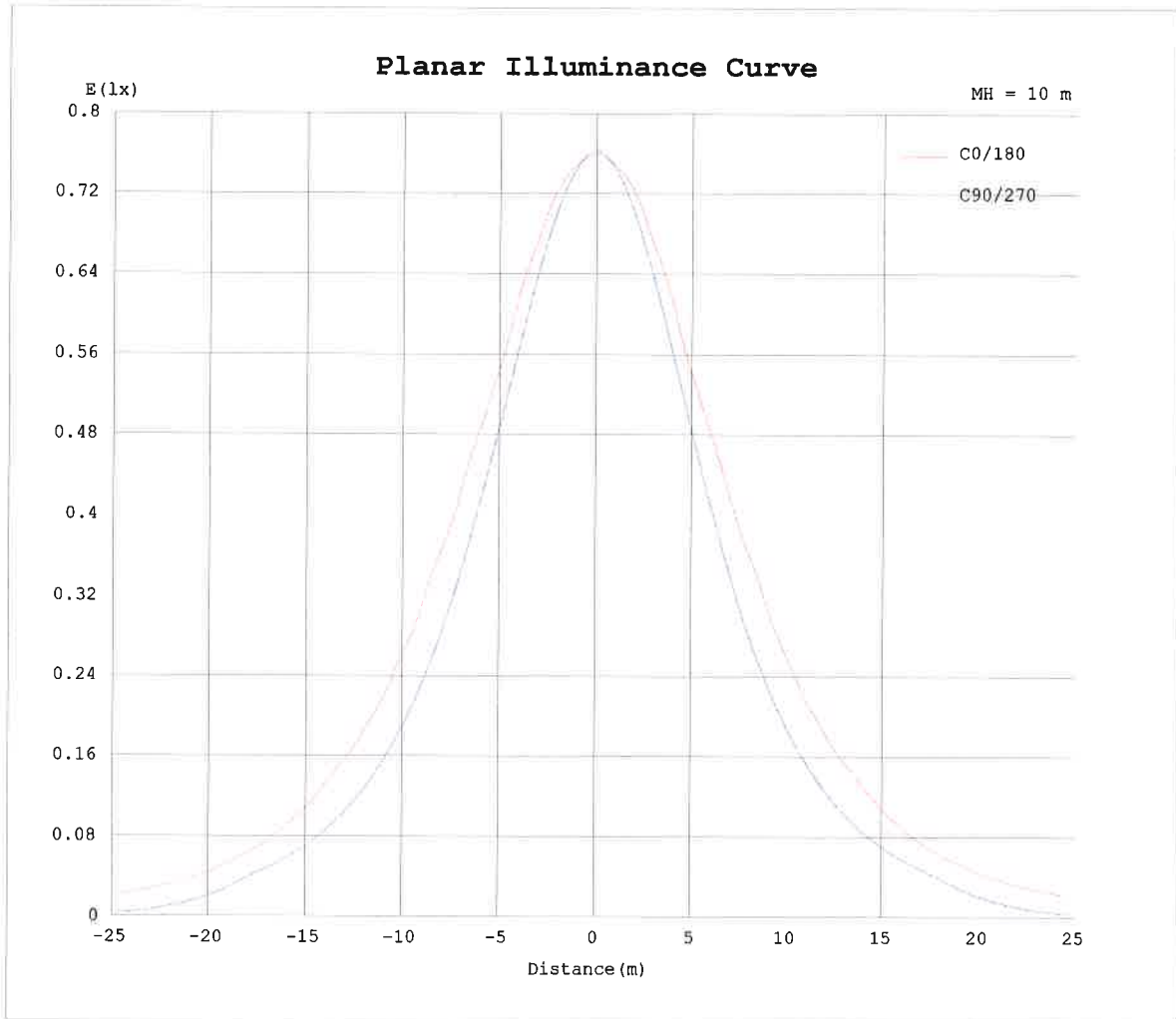
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2.8 Yeşil Renk Spektrokolorimetrik Deneş Sonuřları (Spectrocolorimetric Test Results of the Green color)

Elektriksel Ölçümler
(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,25
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1511
Güç Faktörü (PF) (Power Factor)	-
Ölçülen Frekans (Hz) (Input Frequency)	-
Ortam Sıcaklığı / Bağıl Nem (Ambient Temperature / Relative Humidity)	25,1 °C 48% Rh
Stabilizasyon Süresi (Stabilization Time)	60 dk ±5dk

Spektrokolorimetrik Ölçüm Sonuřları
(Spectrocolorimetric Measurement Results)

Chrom x	0,1925
Chrom y	0,7191
Duv	0,1505
Chrom u'	0,0685
Chrom v'	0,5756
Peak	523 nm
Dominant	531 nm
CCT	7485 K
Nominal CCT	-
Ra(CRI)	0
R9	0
S/P Ratio	2,6
Preburning time	1 hr
Test Configuration	4π



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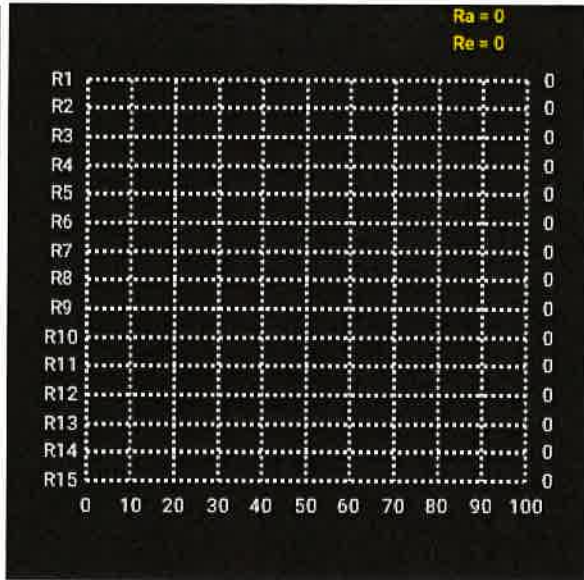
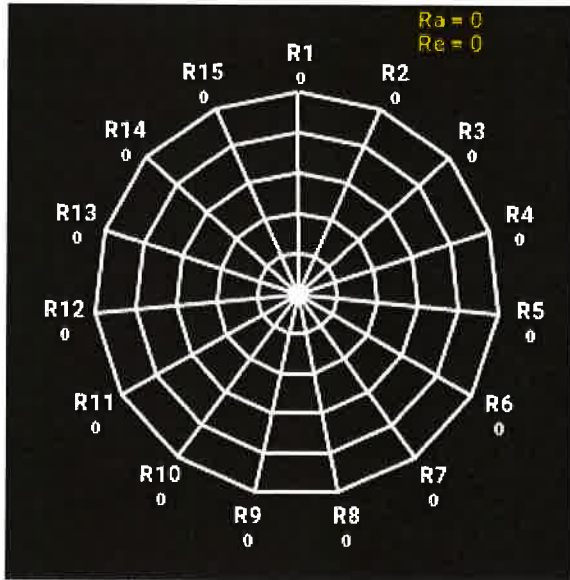
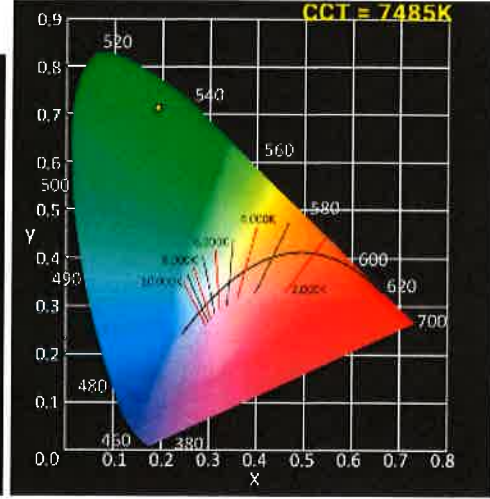
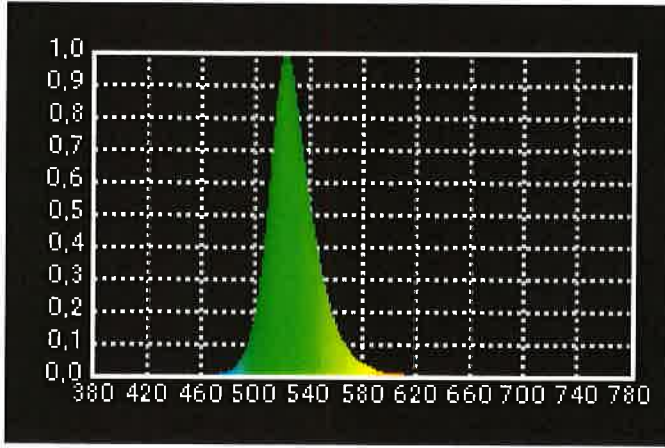
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Yeşil Renk Spektrokolorimetrik Deneş Sonuđları (Spectrocolorimetric Test Results of the Green color)



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3.1 DGC'nin Fotoğrafları (Photos of EUT)

