

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 1 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/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 ROUND DIFFUSED (90cm)
Sword RGB Round diffused (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.
TÜV AUSTRIA TURK is accredited by International Accreditation Service, Inc. (IAS) under registration number TL-806 for TS EN ISO/IEC 17025 April 2012 as a test laboratory.

International Accreditation Service, Inc. (IAS) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği(EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği(ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.
International Accreditation Service, Inc. (IAS) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

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.

Mühür ve Tarih
Seal and Date



Deney Sorumlusu
Person in charge of test

Saltuk Buğra GÜNEŞ

Onaylayan
Approval

Gürhan CANSIZ

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 2 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806
19-TST-0039-44/R1
03-19

İÇİNDEKİLER
(CONTENTS)

	Sayfa <i>Page</i>
1. Dokümantasyon (Documentation)	
1.1 DGC, Çevre Şartları ve Sembollerin Tanımları (Description of the EUT, Environmental Conditions and Symbol Definitions)	3
1.2 Deney Standartları (Test Standards)	4
1.3 Deney Ekipmanları (Test Equipments)	4
2. Deney Sonuçları ve Koşulları (Test Results and Conditions)	5
2.1 Kırmızı renk Fotometrik Deney Sonuçları (Photometric Test Results of the Red color)	5
2.2 Kırmızı Renk Spektrokolorimetrik Deney Sonuçları (spectrocolorimetric Test Results of the Red color)	16
2.3 Mavi renk Fotometrik Deney Sonuçları (Photometric Test Results of the Blue color)	18
2.4 Mavi Renk Spektrokolorimetrik Deney Sonuçları (Spectrocolorimetric Test Results of the Blue color)	29
2.5 RGB renk Fotometrik Deney Sonuçları (Photometric Test Results of the RGB color)	31
2.6 RGB Renk Spektrokolorimetrik Deney Sonuçları (Spectrocolorimetric Test Results of the RGB color)	42
2.7 Yeşil renk Fotometrik Deney Sonuçları (Photometric Test Results of the Green color)	44
2.8 Yeşil Renk Spektrokolorimetrik Deney Sonuçları (Spectrocolorimetric Test Results of the Green color)	55
3.1 DGC'nin Fotoğrafları (Photos of EUT)	57



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 3 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

1.1

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

Markası / Brand

: HERA

Modeli / Model

: RGB Round Diffused (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= Deneyden Geçen Cihaz
EUT=Equipment Under Test



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 4 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

1.2 Deneş Standartları (Test Standards)

Deneşler ařağıdaki standartlara göre yapılmıřtır (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 Deneş 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 $\phi V = \text{Initial Data} \times 0,7$	-
PCB	C13090_R1.0	1.6mm FR44 Layers, 35+35+35+35um Cu	-	-



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 5 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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

Elektriksel Ölçümler

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,565
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1576
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)	46,272
Maksimum Işık Şiddeti (Max. Light Intensity) (cd)	9,530
Armatür Etkinliği (Luminaire Efficacy) (lm/W)	6,12



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 6 / 57

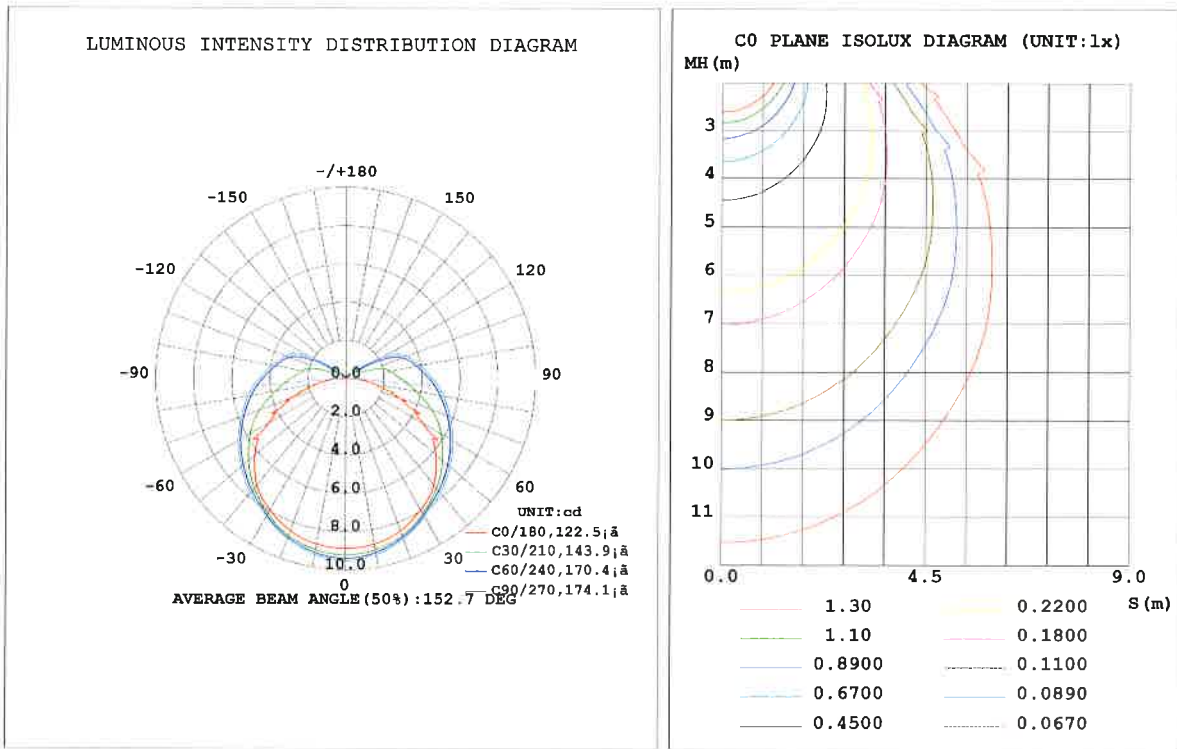
ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 7 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

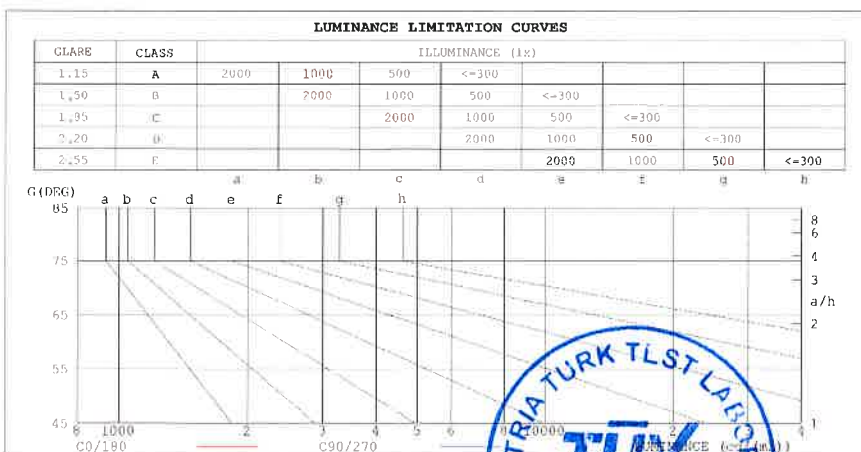
03-19

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	8.895	9.286	9.472	9.286	8.895	9.286	9.472	9.286	0- 5	0.2216	0.2216	0.48,0.48
10	8.819	9.182	9.347	9.182	8.819	9.182	9.347	9.182	5- 10	0.6581	0.8797	1.9,1.9
15	8.685	9.020	9.160	9.020	8.685	9.020	9.160	9.020	10- 15	1.075	1.955	4.23,4.23
20	8.484	8.801	8.918	8.801	8.484	8.801	8.918	8.801	15- 20	1.463	3.418	7.39,7.39
25	8.225	8.533	8.635	8.533	8.225	8.533	8.635	8.533	20- 25	1.810	5.228	11.3,11.3
30	7.944	8.217	8.319	8.217	7.944	8.217	8.319	8.217	25- 30	2.110	7.338	15.9,15.9
35	7.643	7.867	8.058	7.867	7.643	7.867	8.058	7.867	30- 35	2.363	9.701	21,21
40	7.262	7.517	7.778	7.517	7.262	7.517	7.778	7.517	35- 40	2.572	12.27	26.5,26.5
45	6.745	7.197	7.473	7.197	6.745	7.197	7.473	7.197	40- 45	2.727	15.00	32.4,32.4
50	6.218	6.878	7.164	6.878	6.218	6.878	7.164	6.878	45- 50	2.824	17.82	38.5,38.5
55	5.598	6.545	6.845	6.545	5.598	6.545	6.845	6.545	50- 55	2.868	20.69	44.7,44.7
60	4.685	6.202	6.517	6.202	4.685	6.202	6.517	6.202	55- 60	2.858	23.55	50.9,50.9
65	3.979	5.843	6.172	5.843	3.979	5.843	6.172	5.843	60- 65	2.766	26.32	56.9,56.9
70	3.133	5.475	5.834	5.475	3.133	5.475	5.834	5.475	65- 70	2.642	28.96	62.6,62.6
75	2.063	5.105	5.222	5.105	2.063	5.105	5.222	5.105	70- 75	2.474	31.43	67.8,67.8
80	1.301	4.752	5.213	4.752	1.301	4.752	5.213	4.752	75- 80	2.282	33.71	72.9,72.9
85	0.6162	4.402	4.898	4.402	0.6162	4.402	4.898	4.402	80- 85	2.081	35.79	77.4,77.4
90	0.0271	4.045	4.569	4.045	0.0271	4.045	4.569	4.045	85- 90	1.885	37.68	81.4,81.4
95	0.0332	3.707	4.253	3.707	0.0332	3.707	4.253	3.707	90- 95	1.707	39.39	85.1,85.1
100	0.0977	3.393	3.951	3.393	0.0977	3.393	3.951	3.393	95-100	1.552	40.94	89.5,89.5
105	0.1428	3.090	3.657	3.090	0.1428	3.090	3.657	3.090	100-105	1.392	42.33	91.5,91.5
110	0.1719	2.599	3.373	2.599	0.1719	2.599	3.373	2.599	105-110	1.199	43.53	94.1,94.1
115	0.1997	1.700	3.001	1.700	0.1997	1.700	3.001	1.700	110-115	0.9632	44.49	96.2,96.2
120	0.2307	0.9213	2.152	0.9213	0.2307	0.9213	2.152	0.9213	115-120	0.6740	45.17	97.6,97.6
125	0.2624	0.5888	1.130	0.5888	0.2624	0.5888	1.130	0.5888	120-125	0.4026	45.57	98.5,98.5
130	0.2512	0.4689	0.4486	0.4689	0.2512	0.4689	0.4486	0.4689	125-130	0.2234	45.79	99,99
135	0.2052	0.3912	0.2682	0.3912	0.2052	0.3912	0.2682	0.3912	130-135	0.1449	45.94	99.3,99.3
140	0.1715	0.3191	0.2209	0.3191	0.1715	0.3191	0.2209	0.3191	135-140	0.1059	46.04	99.5,99.5
145	0.1387	0.2572	0.1843	0.2572	0.1387	0.2572	0.1843	0.2572	140-145	0.0780	46.12	99.7,99.7
150	0.1081	0.2031	0.1556	0.2031	0.1081	0.2031	0.1556	0.2031	145-150	0.0560	46.18	99.8,99.8
155	0.0844	0.1575	0.1333	0.1575	0.0844	0.1575	0.1333	0.1575	150-155	0.0389	46.21	99.9,99.9
160	0.0576	0.1206	0.1112	0.1206	0.0576	0.1206	0.1112	0.1206	155-160	0.0255	46.24	99.9,99.9
165	0.0327	0.0914	0.0900	0.0914	0.0327	0.0914	0.0900	0.0914	160-165	0.0155	46.26	100,100
170	0.0674	0.0829	0.0711	0.0829	0.0674	0.0829	0.0711	0.0829	165-170	0.0087	46.26	100,100
175	0.0821	0.0819	0.0663	0.0819	0.0821	0.0819	0.0663	0.0819	170-175	0.0057	46.27	100,100
180	0.0731	0.0813	0.0249	0.0813	0.0731	0.0813	0.0249	0.0813	175-180	0.0019	46.27	100,100
DEG	LUMINOUS INTENSITY:cd										UNIT:lm	



LUMINANCE cd/ (m2)

G (DEG)	C0/180	C90/270
85	71	562
80	75	300
75	80	213
70	92	171
65	94	146
60	94	130
55	98	119
50	97	111
45	95	106

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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 8 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

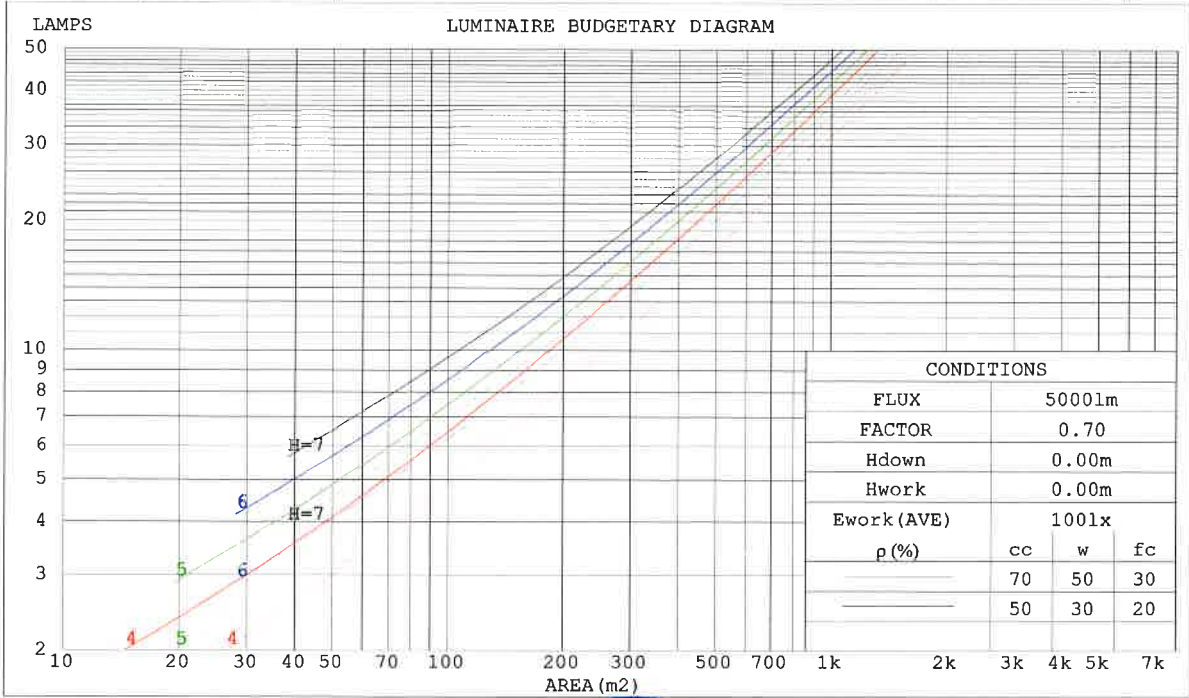
19-TST-0039-
44/R1

03-19

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	1.15	1.15	1.15	1.10	1.10	1.10	1.01	1.01	1.01	.93	.93	.93	.85	.85	.85	.81
1.0	.95	.89	.84	.90	.85	.81	.83	.79	.75	.76	.72	.69	.69	.66	.64	.60
2.0	.81	.72	.66	.77	.70	.63	.70	.64	.59	.64	.59	.55	.58	.54	.51	.48
3.0	.70	.60	.53	.67	.58	.51	.61	.54	.48	.56	.50	.45	.51	.46	.42	.39
4.0	.61	.51	.44	.58	.49	.43	.53	.46	.40	.49	.43	.37	.45	.39	.35	.32
5.0	.54	.44	.37	.52	.43	.36	.47	.40	.34	.43	.37	.32	.40	.34	.30	.27
6.0	.48	.39	.32	.46	.38	.31	.43	.35	.29	.39	.33	.28	.36	.30	.26	.23
7.0	.44	.34	.28	.42	.33	.27	.39	.31	.26	.35	.29	.24	.33	.27	.23	.20
8.0	.40	.31	.25	.38	.30	.24	.35	.28	.23	.32	.26	.21	.30	.24	.20	.18
9.0	.36	.28	.22	.35	.27	.21	.32	.25	.20	.30	.24	.19	.28	.22	.18	.16
10.0	.33	.25	.20	.32	.24	.19	.30	.23	.18	.28	.22	.17	.26	.20	.16	.14



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 9 / 57

ÖLÇÜM RAPORU MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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%	pw	50%	30%	10%	pw	50%	30%	10%	pw	50%	30%		10%
ρfc	20%			20%			20%			20%			20%			0	
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)										
0.0																	
1.0	.402	.229	.072	.389	.222	.070	.365	.209	.067	.343	.198	.063	.322	.187	.060		
2.0	.344	.188	.058	.332	.183	.056	.310	.173	.054	.290	.163	.051	.271	.153	.048		
3.0	.303	.162	.048	.293	.157	.047	.273	.148	.045	.255	.140	.043	.238	.132	.041		
4.0	.272	.141	.042	.262	.137	.041	.244	.130	.039	.228	.122	.037	.212	.115	.035		
5.0	.246	.126	.036	.238	.122	.036	.221	.115	.034	.206	.109	.032	.192	.103	.031		
6.0	.225	.113	.032	.217	.110	.032	.202	.104	.030	.189	.098	.029	.175	.092	.027		
7.0	.207	.102	.029	.200	.100	.028	.187	.094	.027	.174	.089	.026	.162	.084	.025		
8.0	.192	.094	.026	.185	.091	.026	.173	.086	.025	.161	.082	.024	.150	.077	.022		
9.0	.179	.086	.024	.173	.084	.024	.161	.080	.023	.150	.075	.022	.140	.071	.021		
10.0	.167	.080	.022	.161	.078	.022	.151	.074	.021	.141	.070	.020	.131	.066	.019		

pcc	80%			70%			50%			30%			10%			0	
	pw	50%	30%	10%	pw	50%	30%	10%	pw	50%	30%	10%	pw	50%	30%		10%
ρfc	20%			20%			20%			20%			20%			0	
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients (CCEC)										
0.0	.332	.332	.332	.284	.284	.284	.194	.194	.194	.111	.111	.111	.036	.036	.036		
1.0	.329	.298	.270	.282	.256	.232	.193	.176	.161	.111	.102	.093	.036	.033	.030		
2.0	.323	.275	.235	.276	.237	.203	.189	.164	.142	.109	.095	.083	.035	.031	.027		
3.0	.315	.259	.214	.270	.223	.185	.186	.155	.130	.107	.091	.077	.034	.029	.025		
4.0	.307	.247	.200	.264	.213	.174	.181	.148	.122	.105	.087	.072	.034	.028	.024		
5.0	.300	.237	.190	.257	.205	.166	.177	.143	.117	.103	.084	.069	.033	.027	.023		
6.0	.292	.229	.183	.251	.198	.160	.173	.139	.113	.101	.082	.067	.032	.027	.022		
7.0	.285	.222	.178	.245	.193	.155	.169	.135	.110	.098	.080	.066	.032	.026	.022		
8.0	.278	.217	.175	.239	.188	.152	.166	.132	.108	.096	.078	.064	.031	.026	.021		
9.0	.272	.212	.172	.234	.184	.150	.162	.129	.106	.095	.076	.063	.031	.025	.021		
10.0	.266	.208	.169	.229	.180	.148	.159	.127	.105	.093	.075	.063	.030	.025	.021		



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 10 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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	3.5	4.9	4.0	5.4	6.0	4.6	6.0	5.1	6.5	7.1
3H	5.2	6.5	5.7	7.0	7.6	7.4	8.6	7.9	9.2	9.8
4H	5.8	7.0	6.4	7.6	8.2	8.9	10.1	9.5	10.7	11.3
6H	6.2	7.4	6.8	8.0	8.7	10.6	11.8	11.2	12.3	13.0
8H	6.4	7.5	7.0	8.1	8.8	11.6	12.7	12.1	13.3	13.9
12H	6.5	7.6	7.1	8.2	8.9	12.7	13.7	13.3	14.3	15.0
4H 2H	4.6	5.9	5.2	6.4	7.1	5.4	6.6	6.0	7.2	7.9
3H	6.7	7.8	7.3	8.4	9.1	8.4	9.4	9.0	10.0	10.7
4H	7.6	8.6	8.3	9.2	10.0	10.1	11.1	10.7	11.7	12.4
6H	8.3	9.2	9.0	9.9	10.6	12.0	12.9	12.6	13.5	14.3
8H	8.6	9.4	9.2	10.1	10.8	13.0	13.9	13.7	14.5	15.3
12H	8.7	9.5	9.4	10.2	11.0	14.3	15.0	14.9	15.7	16.5
8H 4H	8.8	9.6	9.4	10.3	11.0	10.6	11.4	11.3	12.1	12.9
6H	10.0	10.7	10.7	11.4	12.2	12.8	13.5	13.5	14.2	15.0
8H	10.5	11.2	11.2	11.9	12.7	14.1	14.7	14.8	15.4	16.3
12H	10.9	11.5	11.7	12.2	13.1	15.6	16.1	16.3	16.9	17.7
12H 4H	9.1	9.9	9.8	10.5	11.3	10.7	11.5	11.4	12.1	12.9
6H	10.6	11.2	11.3	12.0	12.8	13.0	13.7	13.8	14.4	15.2
8H	11.4	11.9	12.1	12.7	13.5	14.4	15.0	15.2	15.7	16.6
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.1					+ 0.1 / - 0.1				
1.5H	+ 0.2 / - 0.2					+ 0.2 / - 0.3				
2.0H	+ 0.2 / - 0.3					+ 0.3 / - 0.4				



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 11 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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) $k(RI) \times RCR = 5$									
$k = 0.60$	46	34	26	45	33	26	44	32	26	19
0.80	55	42	34	54	41	33	51	40	33	25
1.00	63	50	41	61	49	41	58	49	39	31
1.25	70	57	48	68	56	47	63	53	46	36
1.50	75	62	53	72	61	52	68	58	50	40
2.00	82	71	62	79	69	61	74	65	58	46
2.50	87	76	68	84	74	66	77	69	63	50
3.00	91	81	73	87	78	71	81	73	67	54
4.00	96	87	80	92	84	78	85	79	73	59
5.00	99	92	85	95	88	83	87	82	77	62
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 12 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

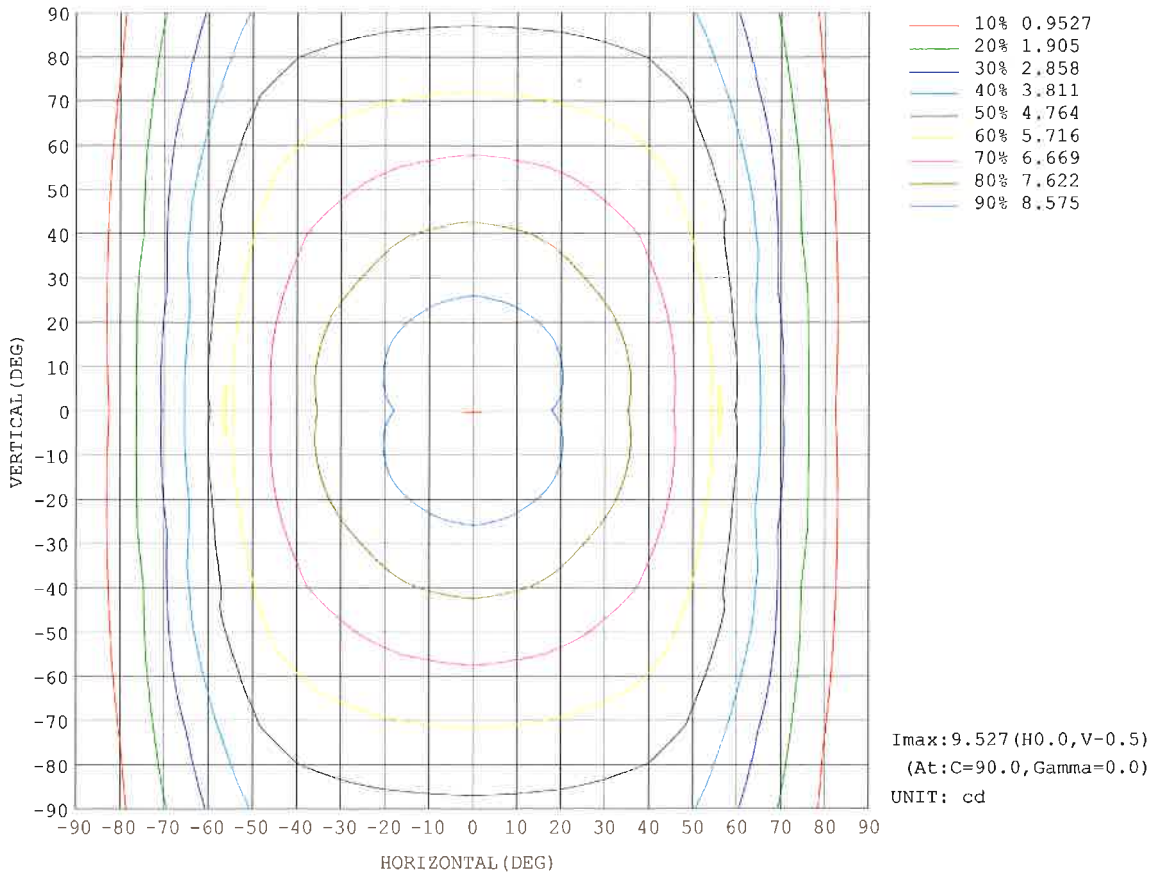
TL-806

19-TST-0039-
44/R1

03-19

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

ISOCANDELA DIAGRAM



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

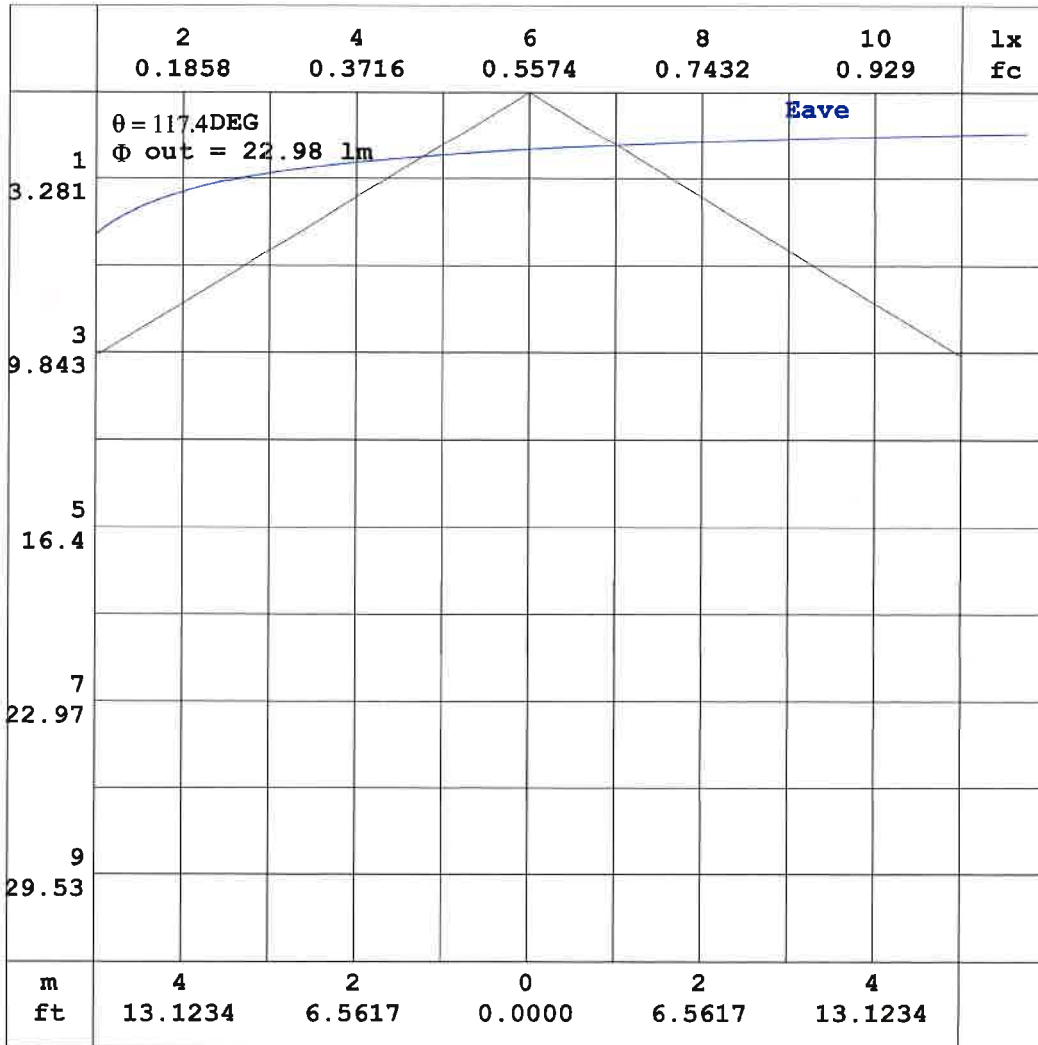
Sayfa / Page : 13 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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.



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 14 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

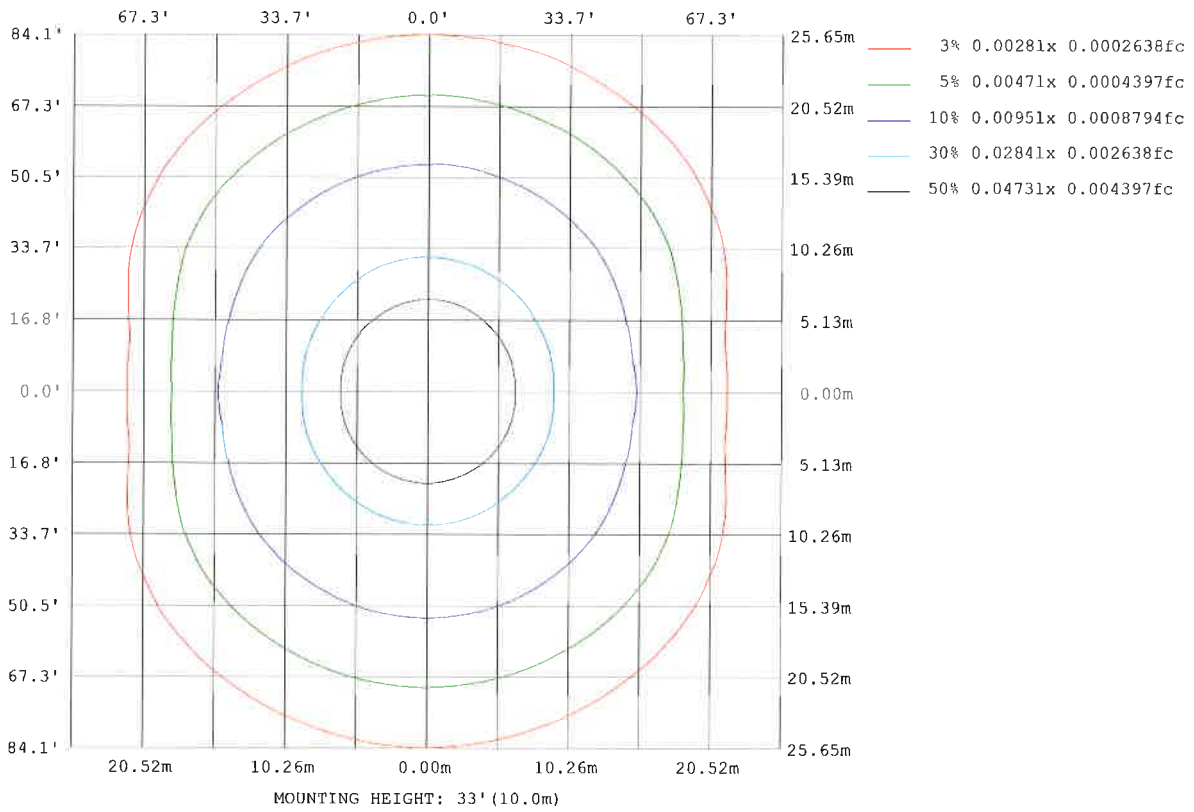
TL-806

19-TST-0039-
44/R1

03-19

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

ISOLUX DIAGRAM



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 15 / 57

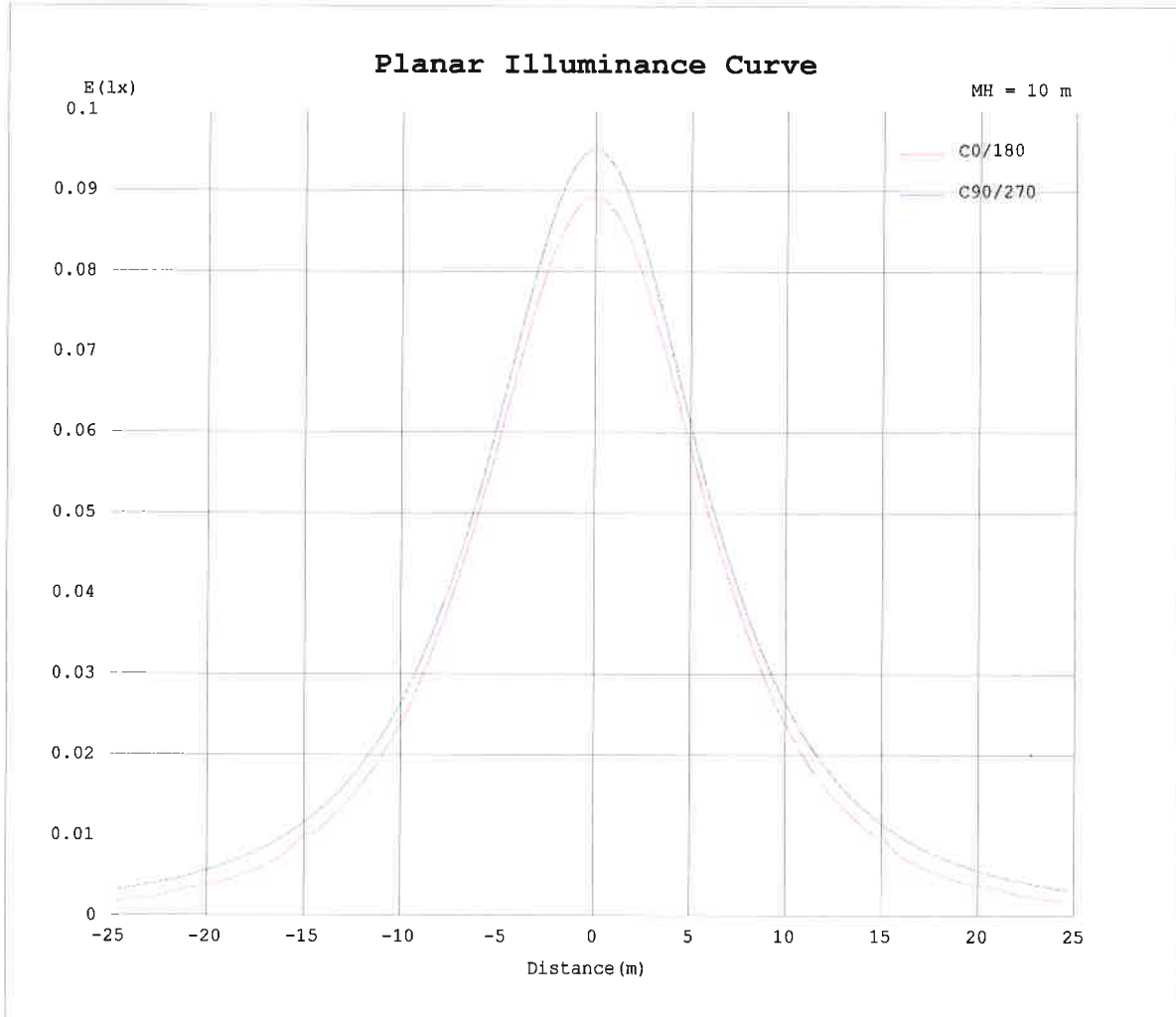
ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 16 / 57

TL-806

19-TST-0039-
44/R1

03-19

ÖLÇÜM RAPORU
MEASUREMENT REPORT**2.2 Kırmızı Renk Spektrokolorimetrik Deney Sonuçları** (spectrocolorimetric Test Results of the Red color)**Elektriksel Ölçümler**

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,565
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1576
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	0,6839
Chrom y	0,3093
Duv	0,00
Chrom u'	0,5119
Chrom v'	0,5209
Peak	628 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



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 17 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

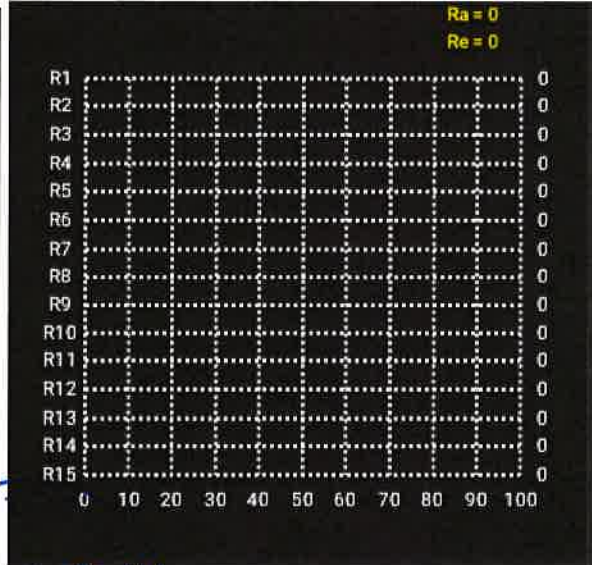
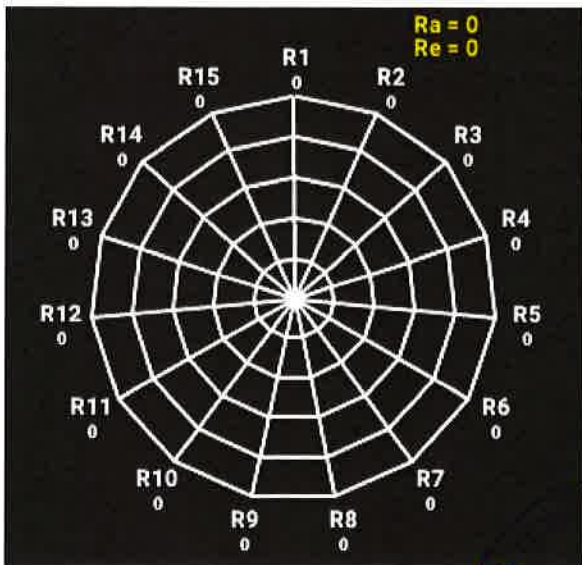
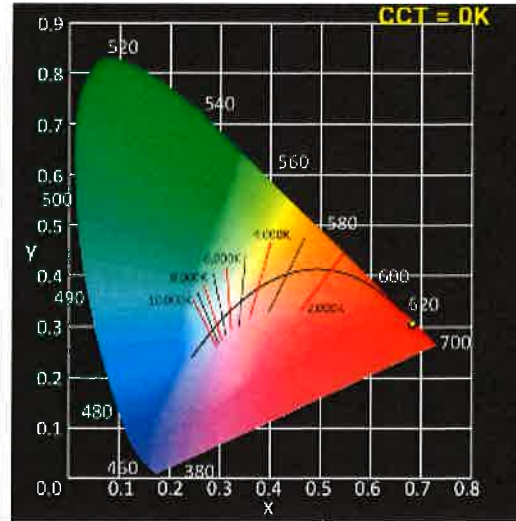
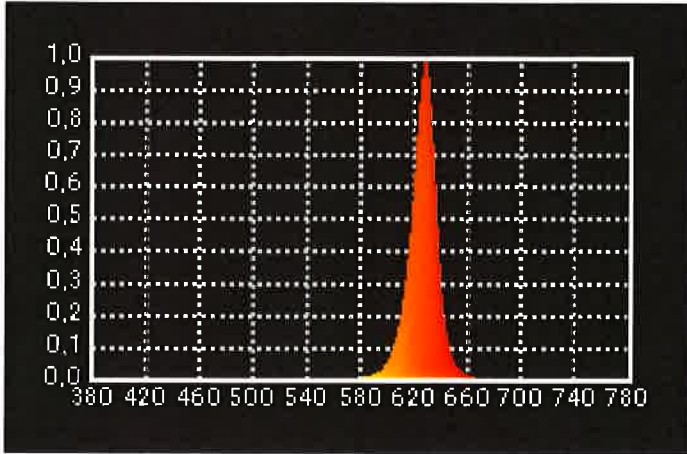
TL-806

19-TST-0039-
44/R1

03-19

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

Spectral Power Distribution



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 18 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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

Elektriksel Ölçümler
(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,550
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1574
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)	42,681
Maksimum Işık Şiddeti (Max. Light Intensity) (cd)	7,365
Armatür Etkinliği (Luminaire Efficacy) (lm/W)	5,65



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 19 / 57

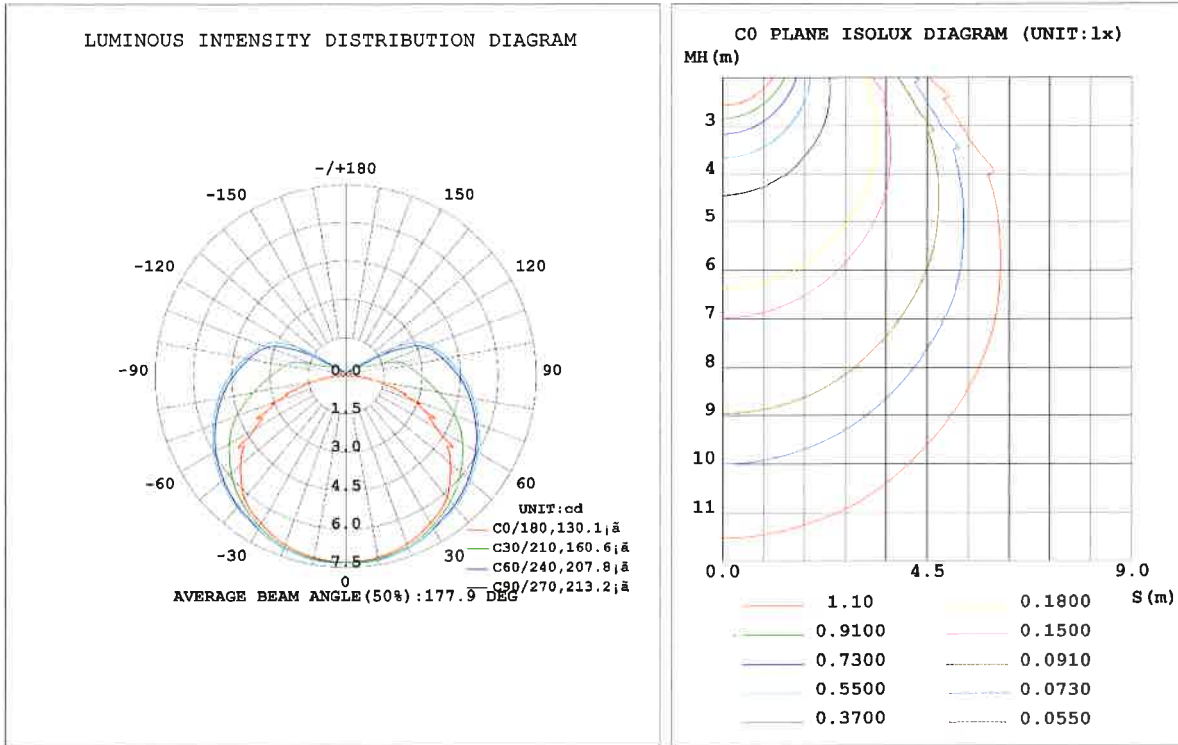
ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 20 / 57

TL-806

19-TST-0039-
44/R1

03-19

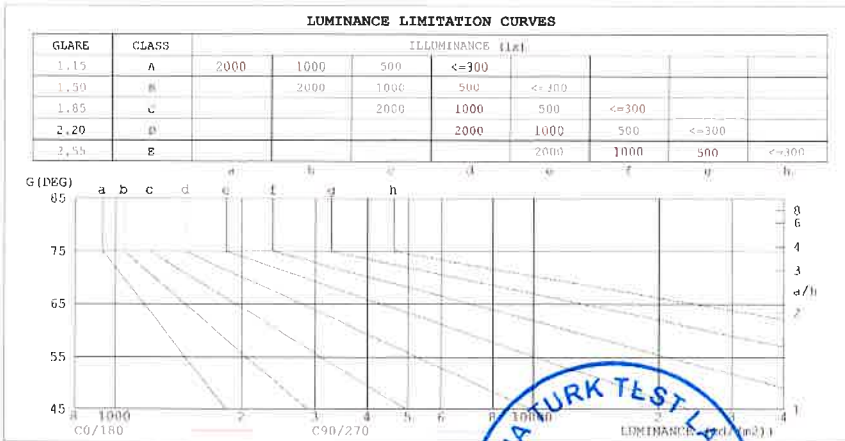
ÖLÇÜM RAPORU
MEASUREMENT REPORT

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

**ZONAL FLUX DIAGRAM
AND LUMINANCE LIMITATION CURVES**

ZONAL FLUX DIAGRAM:

Y	C0	C45	C90	C135	C180	C225	C270	C315	-y	Φ zone	Φ total	llum, lamp
5	7.289	7.331	7.347	7.331	7.289	7.331	7.347	7.331	0- 5	0.1753	0.1753	0.41,0.41
10	7.239	7.307	7.327	7.307	7.239	7.307	7.327	7.307	5- 10	0.5237	0.6990	1.64,1.64
15	7.153	7.248	7.275	7.248	7.153	7.248	7.275	7.248	10- 15	0.8630	1.562	3.66,3.66
20	7.024	7.154	7.188	7.154	7.024	7.154	7.188	7.154	15- 20	1.186	2.748	6.44,6.44
25	6.856	7.025	7.067	7.025	6.856	7.025	7.067	7.025	20- 25	1.484	4.232	9.92,9.92
30	6.670	6.862	6.921	6.862	6.670	6.862	6.921	6.862	25- 30	1.753	5.984	14,14
35	6.468	6.670	6.820	6.670	6.468	6.670	6.820	6.670	30- 35	1.990	7.974	18.7,18.7
40	6.208	6.477	6.695	6.477	6.208	6.477	6.696	6.477	35- 40	2.197	10.17	23.8,23.8
45	5.813	6.305	6.551	6.305	5.813	6.305	6.551	6.305	40- 45	2.366	12.54	29.4,29.4
50	5.396	6.129	6.386	6.129	5.396	6.129	6.386	6.129	45- 50	2.488	15.02	35.2,35.2
55	4.885	5.936	6.205	5.936	4.885	5.936	6.205	5.936	50- 55	2.566	17.59	41.2,41.2
60	4.130	5.724	6.000	5.724	4.130	6.000	5.724	6.000	55- 60	2.598	20.19	47.3,47.3
65	3.678	5.486	5.775	5.486	3.678	5.486	5.775	5.486	60- 65	2.554	22.74	53.3,53.3
70	2.975	5.226	5.541	5.226	2.975	5.226	5.541	5.226	65- 70	2.479	25.22	59.1,59.1
75	1.975	4.949	5.315	4.949	1.975	4.949	5.315	4.949	70- 75	2.355	27.58	64.6,64.6
80	1.230	4.673	5.081	4.673	1.230	4.673	5.081	4.673	75- 80	2.210	29.79	69.8,69.8
85	0.6095	4.391	4.831	4.391	0.6095	4.391	4.831	4.391	80- 85	2.054	31.84	74.6,74.6
90	0.0508	4.091	4.566	4.091	0.0508	4.091	4.566	4.091	85- 90	1.890	33.73	79.79
95	0.0329	3.794	4.296	3.794	0.0329	3.794	4.296	3.794	90- 95	1.734	35.47	83.1,83.1
100	0.0966	3.510	4.027	3.510	0.0966	3.510	4.027	3.510	95-100	1.593	37.06	86.8,86.8
105	0.1420	3.227	3.759	3.227	0.1420	3.227	3.759	3.227	100-105	1.442	38.50	90.2,90.2
110	0.1741	2.737	3.492	2.737	0.1741	2.737	3.492	2.737	105-110	1.252	39.75	93.1,93.1
115	0.2046	1.805	3.133	1.805	0.2046	1.805	3.133	1.805	110-115	1.013	40.77	95.5,95.5
120	0.2401	0.9925	2.258	0.9925	0.2401	0.9925	2.258	0.9925	115-120	0.7148	41.48	97.2,97.2
125	0.2752	0.6363	1.193	0.6363	0.2752	0.6363	1.193	0.6363	120-125	0.4307	41.91	98.2,98.2
130	0.2668	0.5040	0.4715	0.5040	0.2668	0.5040	0.4715	0.5040	125-130	0.2415	42.15	98.8,98.8
135	0.2213	0.4218	0.2811	0.4218	0.2213	0.4218	0.2811	0.4218	130-135	0.1578	42.31	99.1,99.1
140	0.1882	0.3477	0.2325	0.3477	0.1882	0.3477	0.2325	0.3477	135-140	0.1157	42.43	99.4,99.4
145	0.1532	0.2832	0.1955	0.2832	0.1532	0.2832	0.1955	0.2832	140-145	0.0856	42.51	99.6,99.6
150	0.1198	0.2244	0.1663	0.2244	0.1198	0.2244	0.1663	0.2244	145-150	0.0619	42.57	99.7,99.7
155	0.0955	0.1753	0.1436	0.1753	0.0955	0.1753	0.1436	0.1753	150-155	0.0434	42.62	99.8,99.8
160	0.0676	0.1352	0.1216	0.1352	0.0676	0.1352	0.1216	0.1352	155-160	0.0286	42.65	99.9,99.9
165	0.0413	0.1037	0.0993	0.1037	0.0413	0.1037	0.0993	0.1037	160-165	0.0175	42.66	100,100
170	0.0761	0.0920	0.0781	0.0920	0.0761	0.0920	0.0781	0.0920	165-170	0.0099	42.67	100,100
175	0.0914	0.0873	0.0715	0.0873	0.0914	0.0873	0.0715	0.0873	170-175	0.0062	42.68	100,100
180	0.0812	0.0842	0.0265	0.0842	0.0812	0.0842	0.0265	0.0842	175-180	0.0020	42.68	100,100



LUMINANCE cd/(m2)

G (DEG)	C0/180	C90/270
85	70	554
80	71	293
75	76	205
70	87	162
65	87	137
60	83	120
55	85	108
50	84	99
45	82	93



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 21 / 57

TL-806

19-TST-0039-
44/R1

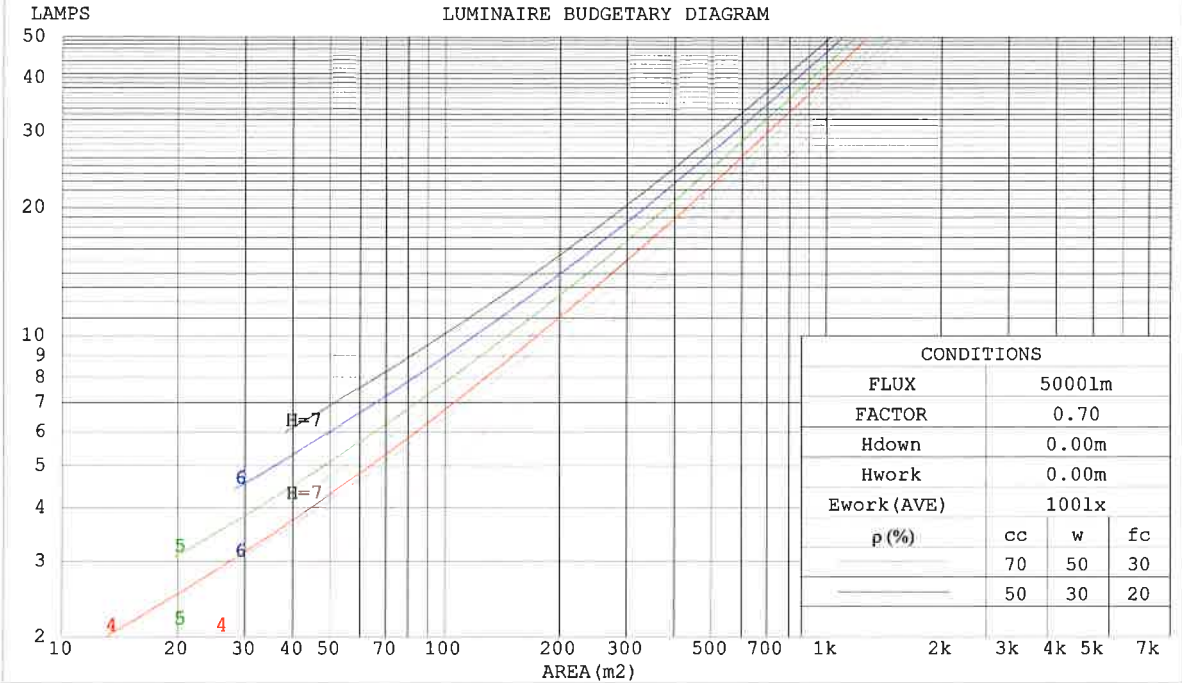
03-19

ÖLÇÜM RAPORU
MEASUREMENT REPORT

2.3 Mavi renk Fotometrik Deneş Sonuđları (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
p _w																0
p _{fc}																0
RCR	RCR:Room Cavity Ratio			Coefficients of Utilization (CU)												
0.0	1.14	1.14	1.14	1.09	1.09	1.09	.99	.99	.99	.91	.91	.91	.83	.83	.83	.79
1.0	.93	.88	.83	.89	.84	.79	.81	.77	.73	.73	.70	.67	.66	.64	.61	.57
2.0	.79	.71	.64	.75	.68	.62	.68	.62	.57	.62	.57	.53	.56	.52	.48	.45
3.0	.68	.59	.51	.65	.57	.50	.59	.52	.46	.53	.47	.43	.48	.43	.39	.36
4.0	.60	.50	.42	.57	.48	.41	.52	.44	.38	.47	.40	.35	.42	.37	.33	.30
5.0	.53	.43	.36	.50	.41	.35	.46	.38	.32	.42	.35	.30	.38	.32	.28	.25
6.0	.47	.38	.31	.45	.36	.30	.41	.33	.28	.37	.31	.26	.34	.28	.24	.21
7.0	.42	.33	.27	.41	.32	.26	.37	.30	.24	.34	.27	.23	.31	.25	.21	.19
8.0	.38	.30	.23	.37	.28	.23	.34	.26	.21	.31	.25	.20	.28	.23	.19	.16
9.0	.35	.27	.21	.34	.26	.20	.31	.24	.19	.28	.22	.18	.26	.21	.17	.15
10.0	.32	.24	.19	.31	.23	.18	.28	.22	.17	.26	.20	.16	.24	.19	.15	.13



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 22 / 57

TL-806

19-TST-0039-
44/R1

03-19

ÖLÇÜM RAPORU MEASUREMENT REPORT

2.3

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

WEC AND CCEC

pcc	80%			70%			50%			30%			10%			0
	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	
p _w																0
p _{fc}																0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)									
0.0																
1.0	.413	.235	.074	.399	.228	.072	.374	.214	.068	.350	.202	.065	.328	.190	.061	
2.0	.351	.192	.059	.338	.186	.057	.315	.175	.054	.294	.165	.052	.274	.155	.049	
3.0	.308	.164	.049	.297	.159	.048	.276	.150	.045	.256	.140	.043	.238	.132	.041	
4.0	.275	.143	.042	.265	.139	.041	.246	.131	.039	.228	.123	.037	.212	.115	.035	
5.0	.249	.127	.037	.240	.123	.036	.222	.116	.034	.206	.109	.032	.191	.102	.031	
6.0	.227	.114	.033	.219	.111	.032	.203	.104	.030	.188	.098	.029	.174	.092	.027	
7.0	.209	.103	.029	.201	.100	.029	.187	.094	.027	.173	.089	.026	.160	.083	.024	
8.0	.193	.094	.027	.186	.092	.026	.173	.086	.025	.160	.081	.023	.148	.076	.022	
9.0	.180	.087	.024	.173	.084	.024	.161	.080	.023	.149	.075	.021	.138	.070	.020	
10.0	.168	.080	.022	.162	.078	.022	.150	.074	.021	.140	.069	.020	.129	.065	.019	

pcc	80%			70%			50%			30%			10%			0
	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	
p _w																0
p _{fc}																0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.350	.350	.350	.299	.299	.299	.204	.204	.204	.117	.117	.117	.038	.038	.038	
1.0	.349	.316	.287	.298	.271	.247	.204	.187	.171	.117	.108	.099	.038	.035	.032	
2.0	.342	.294	.253	.293	.253	.219	.201	.175	.153	.116	.102	.089	.037	.033	.029	
3.0	.335	.278	.232	.287	.239	.201	.197	.166	.141	.114	.097	.083	.037	.032	.027	
4.0	.327	.265	.218	.281	.229	.190	.193	.160	.133	.112	.094	.079	.036	.030	.026	
5.0	.319	.256	.209	.274	.221	.182	.189	.155	.128	.109	.091	.076	.035	.030	.025	
6.0	.312	.248	.202	.268	.215	.176	.185	.150	.124	.107	.088	.074	.035	.029	.024	
7.0	.304	.241	.197	.262	.209	.172	.181	.147	.122	.105	.086	.072	.034	.028	.024	
8.0	.298	.236	.193	.256	.205	.169	.177	.144	.120	.103	.085	.071	.033	.028	.024	
9.0	.291	.231	.190	.251	.201	.166	.174	.141	.118	.101	.083	.070	.033	.027	.023	
10.0	.285	.227	.188	.246	.197	.164	.171	.139	.117	.099	.082	.070	.032	.027	.023	



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 23 / 57

TL-806

19-TST-0039-
44/R1

03-19

ÖLÇÜM RAPORU MEASUREMENT REPORT

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	2.9	4.3	3.5	4.9	5.5	4.2	5.6	4.8	6.2	6.8
3H	4.7	5.9	5.2	6.5	7.2	7.1	8.4	7.7	9.0	9.6
4H	5.3	6.6	5.9	7.2	7.8	8.7	9.9	9.3	10.5	11.2
6H	5.8	7.0	6.5	7.6	8.3	10.5	11.7	11.1	12.3	13.0
8H	6.0	7.1	6.7	7.8	8.5	11.5	12.6	12.1	13.2	14.0
12H	6.2	7.3	6.8	7.9	8.6	12.7	13.7	13.3	14.4	15.1
4H 2H	4.2	5.4	4.8	6.0	6.7	5.1	6.3	5.7	6.9	7.6
3H	6.3	7.4	7.0	8.0	8.8	8.2	9.2	8.8	9.9	10.6
4H	7.3	8.2	7.9	8.9	9.7	9.9	10.9	10.6	11.6	12.3
6H	8.0	8.9	8.7	9.6	10.4	11.9	12.8	12.6	13.5	14.3
8H	8.3	9.1	9.0	9.8	10.6	13.0	13.8	13.7	14.5	15.4
12H	8.5	9.3	9.2	10.0	10.8	14.3	15.0	15.0	15.8	16.6
8H 4H	8.5	9.3	9.2	10.0	10.9	10.5	11.3	11.2	12.0	12.8
6H	9.8	10.5	10.5	11.2	12.1	12.8	13.5	13.5	14.2	15.1
8H	10.4	11.0	11.1	11.8	12.6	14.1	14.7	14.8	15.5	16.4
12H	10.8	11.4	11.6	12.2	13.1	15.6	16.2	16.4	16.9	17.8
12H 4H	8.9	9.6	9.6	10.4	11.2	10.6	11.3	11.3	12.1	12.9
6H	10.5	11.1	11.2	11.9	12.7	13.0	13.6	13.8	14.4	15.3
8H	11.3	11.9	12.1	12.6	13.5	14.5	15.0	15.2	15.8	16.7
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.1					+ 0.1 / - 0.1				
1.5H	+ 0.1 / - 0.2					+ 0.2 / - 0.3				
2.0H	+ 0.2 / - 0.3					+ 0.3 / - 0.4				

CIE Pub.117 Corrected 42.68 lm Total Lamp Luminous Flux. (8log(F/F0) = -11.0)



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 24 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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) $k(RI) \times RCR = 5$									
$k = 0.60$	45	32	24	44	31	24	42	31	24	17
0.80	54	40	32	52	39	31	49	38	31	23
1.00	61	48	39	59	47	38	56	47	37	28
1.25	68	55	46	66	53	45	61	51	43	33
1.50	73	60	51	71	59	50	66	55	48	37
2.00	81	69	60	78	67	58	72	63	56	43
2.50	86	74	66	82	72	64	75	67	61	47
3.00	89	79	71	86	77	69	79	71	65	51
4.00	95	86	79	90	83	76	83	76	71	56
5.00	98	90	84	93	87	81	85	80	75	59
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 25 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

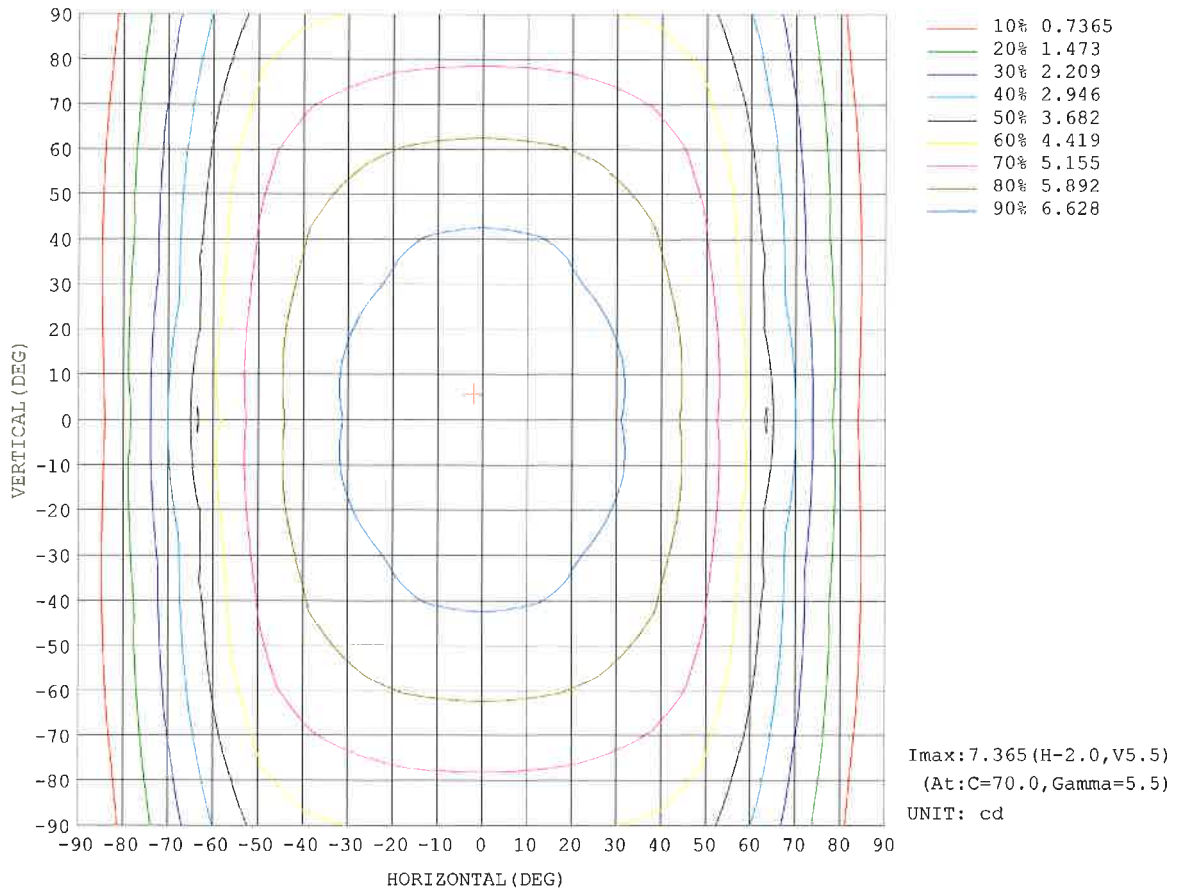
TL-806

19-TST-0039-
44/R1

03-19

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

ISOCANDELA DIAGRAM



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 26 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

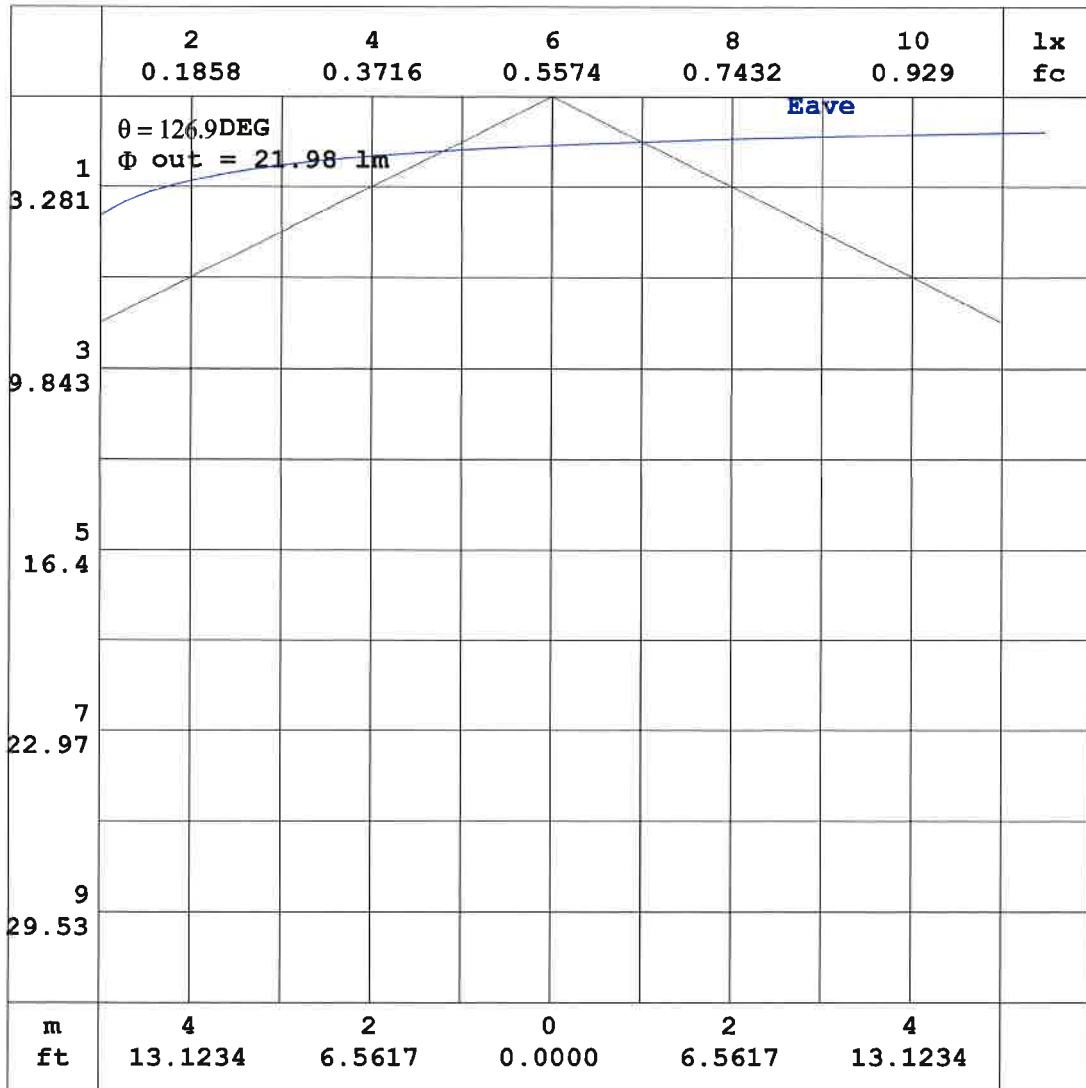
TL-806

19-TST-0039-
44/R1

03-19

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.



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 27 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

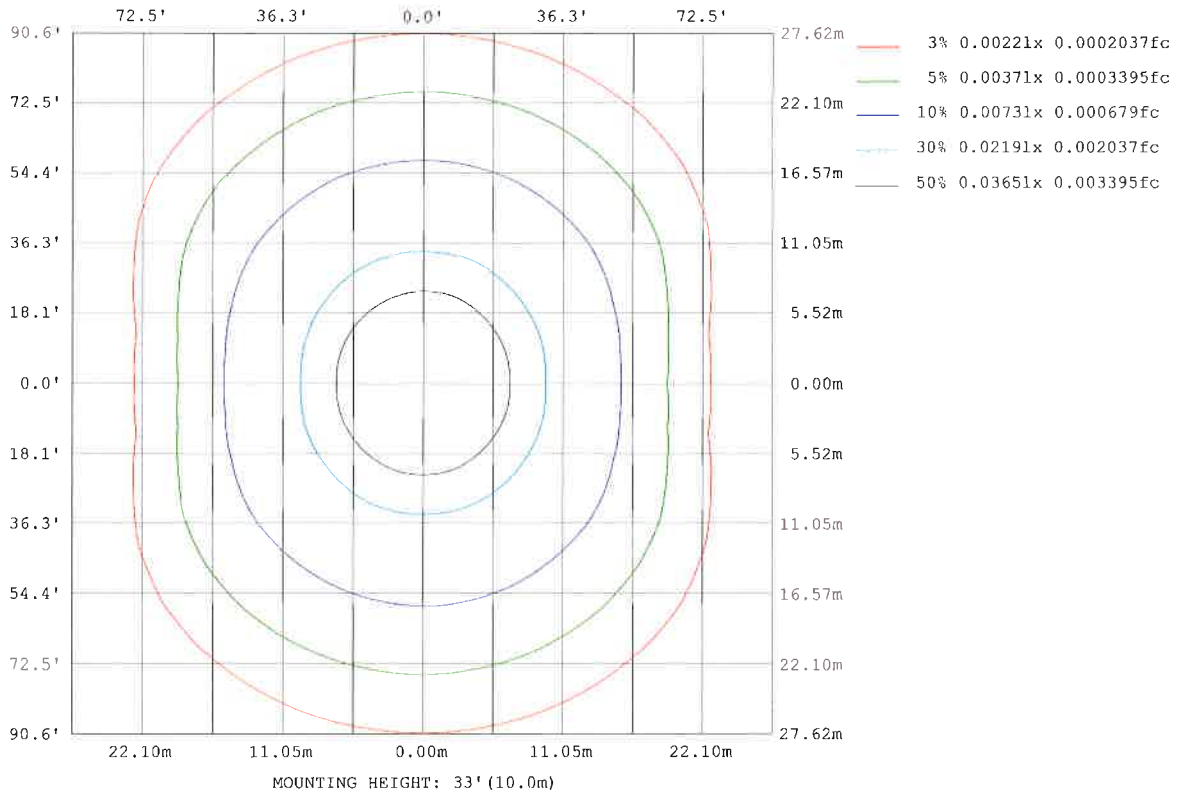
TL-806

19-TST-0039-
44/R1

03-19

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

ISOLUX DIAGRAM



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 28 / 57

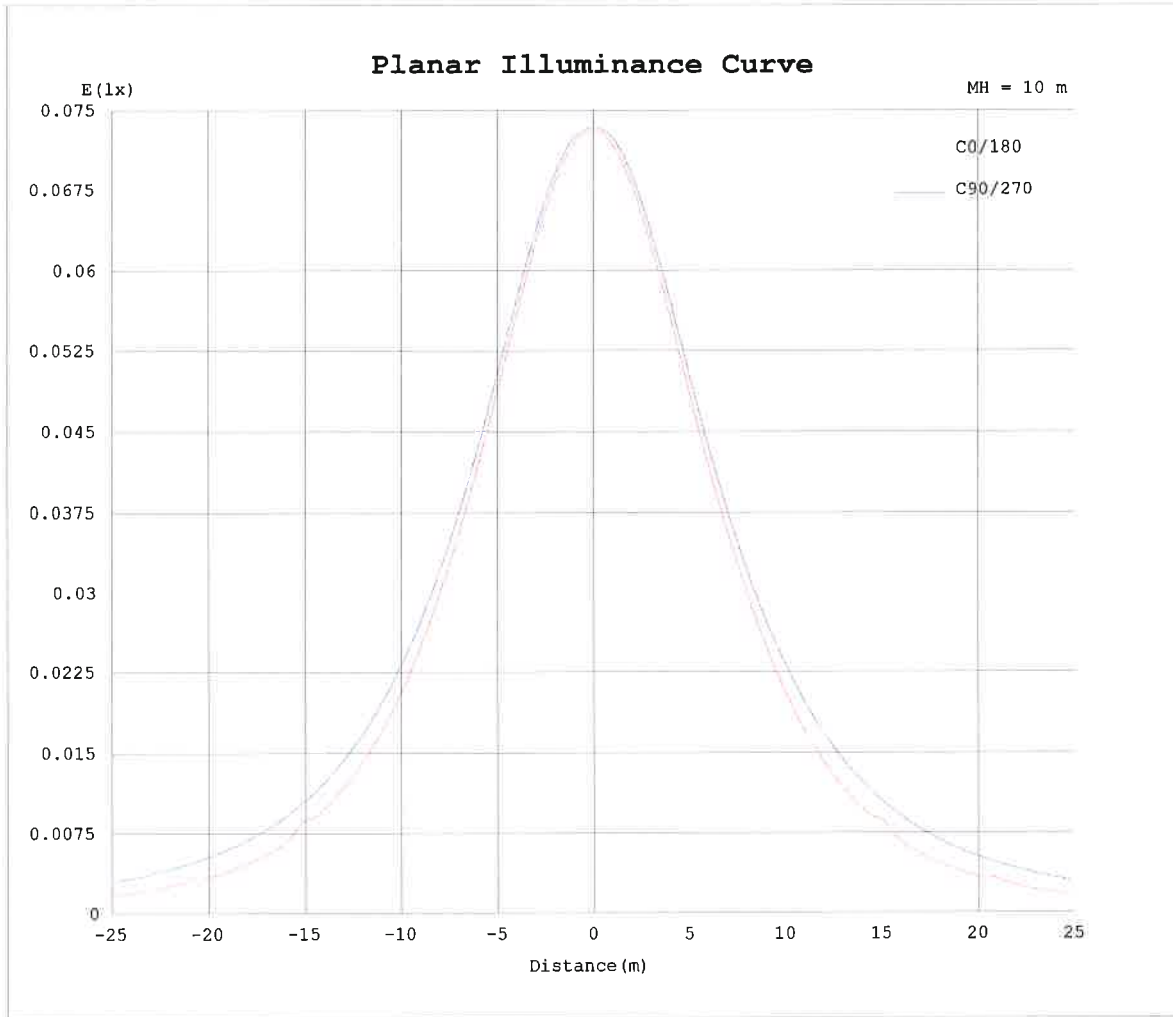
ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 29 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,550
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1574
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 Sonuçları

(Spectrocolorimetric Measurement Results)

Chrom x	0,1272
Chrom y	0,0943
Duv	0,00
Chrom u'	0,1313
Chrom v'	0,2189
Peak	469 nm
Dominant	474 nm
CCT	0 K
Nominal CCT	-
Ra(CRI)	0
R9	0
S/P Ratio	12,7
Preburning time	1 hr
Test Configuration	4π



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 30 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

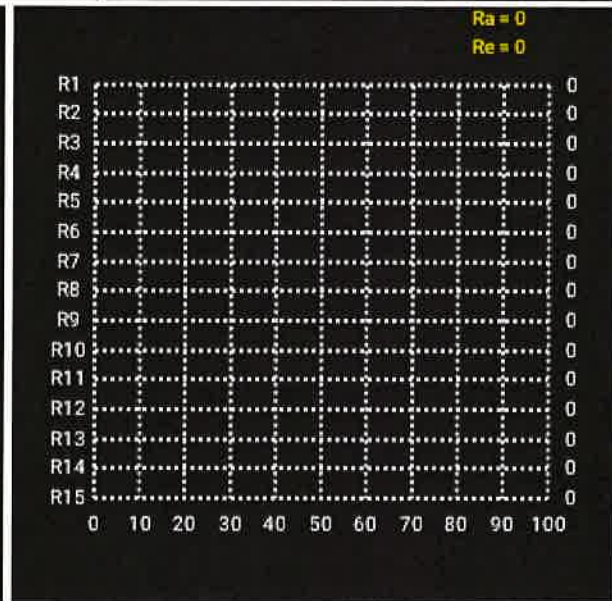
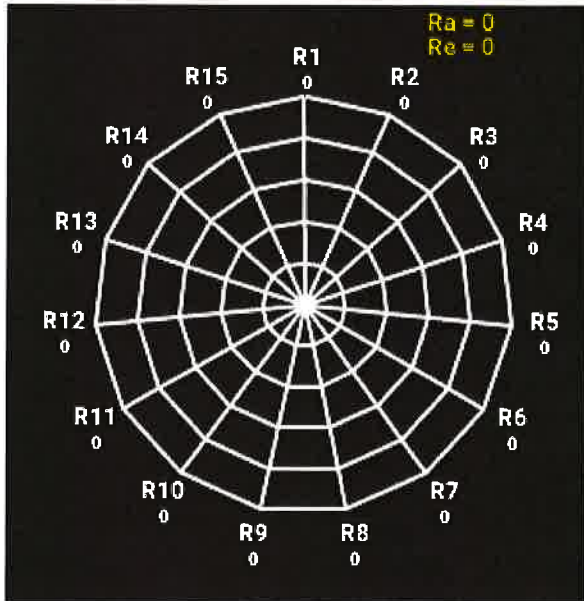
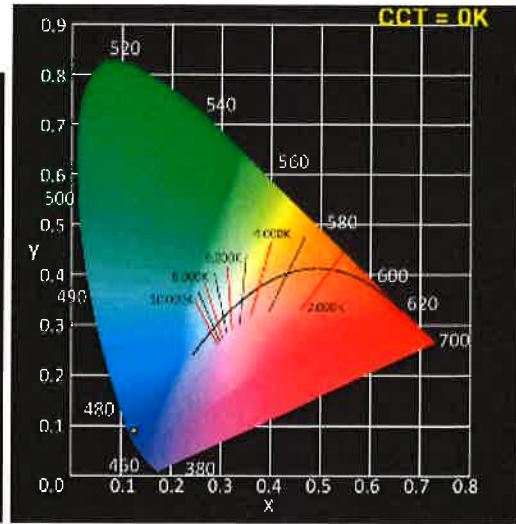
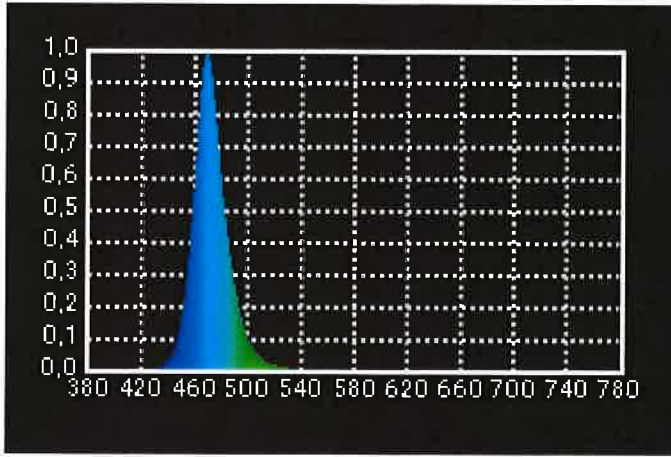
TL-806

19-TST-0039-
44/R1

03-19

2.4

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



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 31 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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

Elektriksel Ölçümler

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	16,32
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,34
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)	257,23
Maksimum Işık Şiddeti (Max. Light Intensity) (cd)	47,36
Armatür Etkinliği (Luminaire Efficacy) (lm/W)	15,76



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 32 / 57

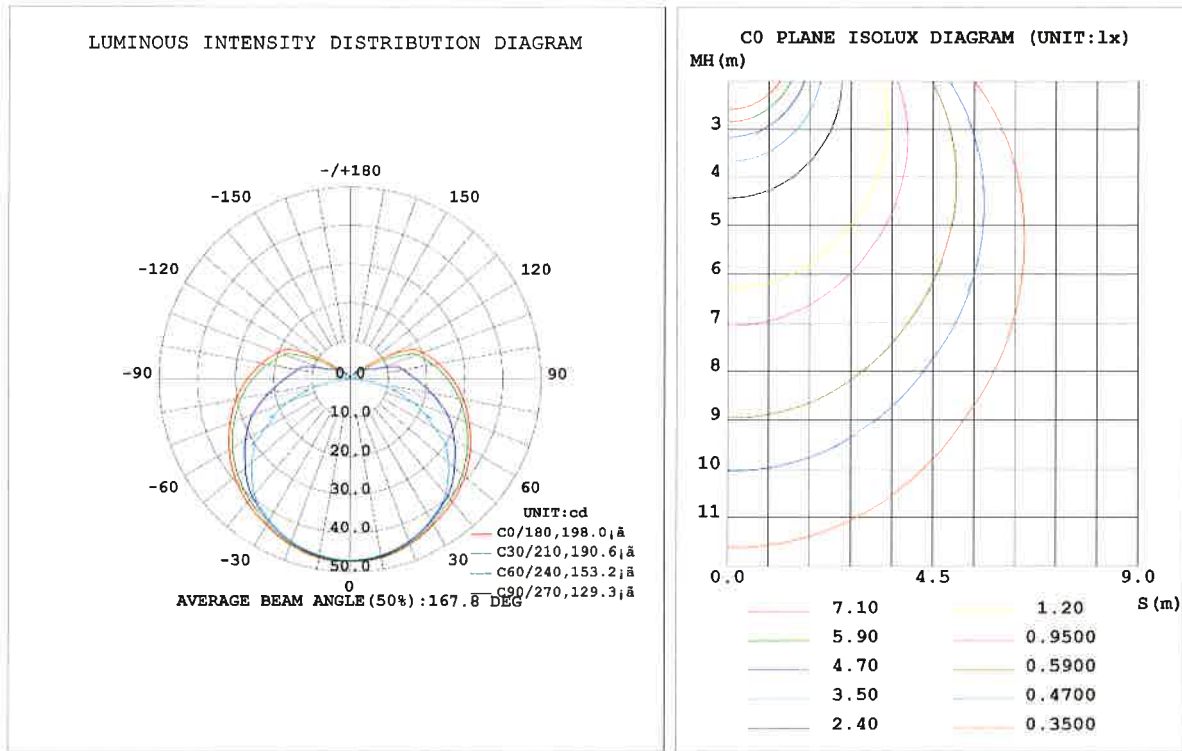
ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 33 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

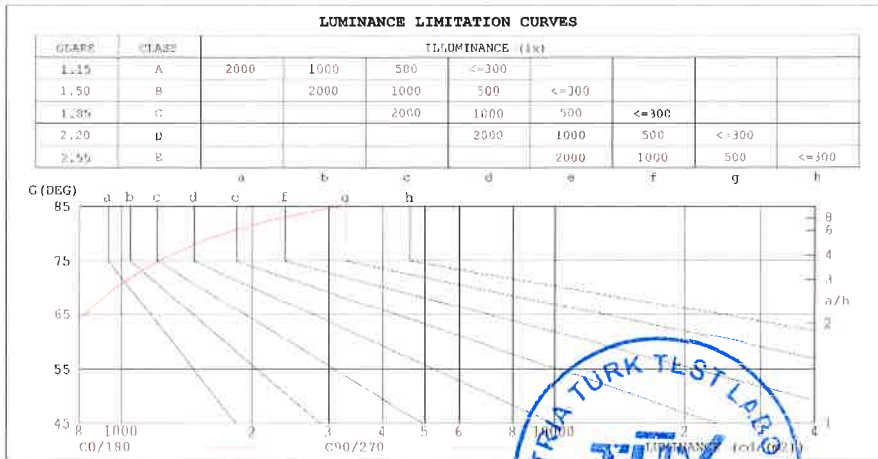
03-19

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

**ZONAL FLUX DIAGRAM
AND LUMINANCE LIMITATION CURVES**

ZONAL FLUX DIAGRAM:

y	C0	C45	C90	C135	C180	C225	C270	C315	y	φ zone	φ total	llum, lamp
5	47.34	47.03	46.78	47.03	47.34	47.03	46.78	47.03	0- 5	1.126	1.126	0.44,0.44
10	47.11	46.75	46.38	46.75	47.11	46.75	46.38	46.75	5- 10	3.356	4.482	1.74,1.74
15	46.60	46.17	45.71	46.17	46.60	46.17	45.71	46.17	10- 15	5.513	9.995	3.89,3.89
20	45.82	45.33	44.76	45.33	45.82	45.33	44.76	45.33	15- 20	7.542	17.54	6.82,6.82
25	44.84	44.24	43.52	44.24	44.84	44.24	43.52	44.24	20- 25	9.392	26.93	10.5,10.5
30	43.67	42.96	42.17	42.96	43.67	42.96	42.17	42.96	25- 30	11.03	37.96	14.8,14.8
35	42.91	41.50	40.77	41.50	42.91	41.50	40.77	41.50	30- 35	12.46	50.42	19.6,19.6
40	41.77	40.07	38.93	40.07	41.77	40.07	38.93	40.07	35- 40	13.68	64.10	24.9,24.9
45	40.59	38.76	36.31	38.76	40.59	38.76	36.31	38.76	40- 45	14.63	78.73	30.6,30.6
50	39.31	37.44	33.61	37.44	39.31	37.44	33.61	37.44	45- 50	15.27	94.00	36.5,36.5
55	37.93	35.96	30.45	35.96	37.93	35.96	30.45	35.96	50- 55	15.64	109.6	42.6,42.6
60	36.44	34.30	25.69	34.30	36.44	34.30	25.69	34.30	55- 60	15.71	125.3	48.7,48.7
65	34.85	32.55	22.26	32.55	34.85	32.55	22.26	32.55	60- 65	15.36	140.7	54.7,54.7
70	33.24	30.74	18.14	30.74	33.24	30.74	18.14	30.74	65- 70	14.81	155.5	60.5,60.5
75	31.72	28.86	12.12	28.86	31.72	28.86	12.12	28.86	70- 75	13.97	169.5	65.9,65.9
80	30.14	27.03	7.602	27.03	30.14	27.03	7.602	27.03	75- 80	13.02	182.5	71.7,71.7
85	28.49	25.20	3.799	25.20	28.49	25.20	3.799	25.20	80- 85	12.00	194.5	75.6,75.6
90	26.75	23.29	0.4325	23.29	26.75	23.29	0.4325	23.29	85- 90	10.94	205.4	79.9,79.9
95	25.04	21.46	0.4751	21.46	25.04	21.46	0.4751	21.46	90- 95	9.966	215.4	83.7,83.7
100	23.35	19.73	0.8156	19.73	23.35	19.73	0.8156	19.73	95-100	9.122	224.5	87.3,87.3
105	21.70	18.06	1.113	18.06	21.70	18.06	1.113	18.06	100-105	8.214	232.7	90.5,90.5
110	20.07	15.33	1.320	15.33	20.07	15.33	1.320	15.33	105-110	7.143	239.9	93.3,93.3
115	18.31	10.10	1.512	10.10	18.31	10.10	1.512	10.10	110-115	5.934	245.7	95.5,95.5
120	12.76	5.784	1.679	5.784	12.76	5.784	1.679	5.784	115-120	4.131	249.9	97.1,97.1
125	6.868	4.134	1.813	4.134	6.868	4.134	1.813	4.134	120-125	2.520	252.4	98.1,98.1
130	2.412	3.241	1.833	3.241	2.412	3.241	1.833	3.241	125-130	1.412	253.8	98.7,98.7
135	1.927	2.562	1.686	2.562	1.927	2.562	1.686	2.562	130-135	0.9817	254.8	99.99
140	1.693	2.044	1.524	2.044	1.693	2.044	1.524	2.044	135-140	0.7384	255.5	99.3,99.3
145	1.481	1.636	1.356	1.636	1.481	1.636	1.356	1.636	140-145	0.5490	256.1	99.5,99.5
150	1.311	1.311	1.194	1.311	1.311	1.311	1.194	1.311	145-150	0.4043	256.5	99.7,99.7
155	1.159	1.001	1.043	1.001	1.159	1.001	1.043	1.001	150-155	0.2919	256.8	99.8,99.8
160	1.012	0.7770	0.9058	0.7770	1.012	0.7770	0.9058	0.7770	155-160	0.2024	257.0	99.9,99.9
165	0.8727	0.6099	0.8099	0.6099	0.8727	0.6099	0.8099	0.6099	160-165	0.1313	257.1	99.9,99.9
170	0.7551	0.7116	0.8393	0.7116	0.7551	0.7116	0.8393	0.7116	165-170	0.0822	257.2	100,100
175	0.6959	0.7850	0.8128	0.7850	0.6959	0.7850	0.8128	0.7850	170-175	0.0498	257.2	100,100
180	0.4134	0.8080	0.8040	0.8080	0.4134	0.8080	0.8040	0.8080	175-180	0.0174	257.2	100,100
DEG	LUMINOUS INTENSITY:cd										UNIT:lm	



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 34 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

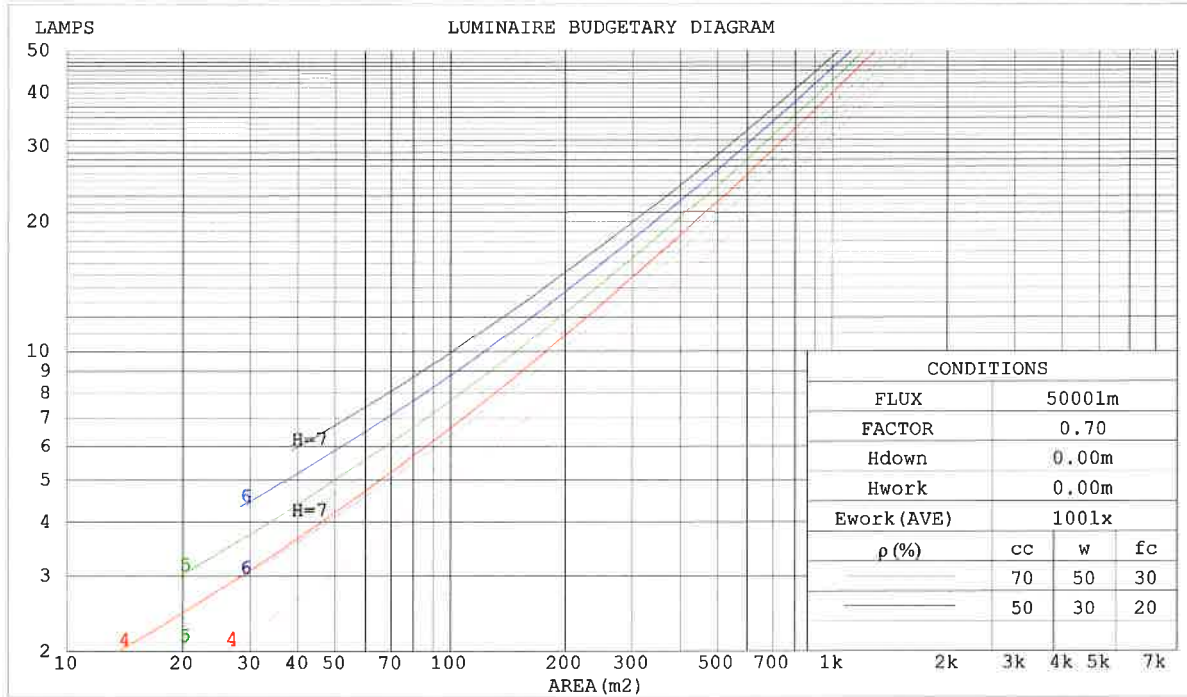
19-TST-0039-
44/R1

03-19

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

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

ρcc	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	1.14	1.14	1.14	1.09	1.09	1.09	.00	.00	.00	.91	.91	.91	.84	.84	.84	.80
1.0	.94	.88	.83	.90	.85	.80	.82	.77	.74	.74	.71	.68	.67	.65	.62	.59
2.0	.80	.72	.65	.76	.69	.62	.69	.63	.58	.63	.58	.53	.57	.53	.49	.46
3.0	.69	.60	.52	.66	.57	.50	.60	.53	.47	.54	.48	.43	.49	.44	.40	.37
4.0	.60	.51	.43	.58	.49	.42	.52	.45	.39	.48	.41	.36	.43	.38	.34	.31
5.0	.53	.44	.36	.51	.42	.35	.46	.39	.33	.42	.36	.31	.38	.33	.29	.26
6.0	.48	.38	.31	.46	.37	.30	.42	.34	.28	.38	.32	.27	.35	.29	.25	.22
7.0	.43	.34	.27	.41	.32	.26	.38	.30	.25	.34	.28	.23	.31	.26	.22	.19
8.0	.39	.30	.24	.37	.29	.23	.34	.27	.22	.31	.25	.21	.29	.23	.19	.17
9.0	.35	.27	.21	.34	.26	.21	.31	.24	.20	.29	.23	.18	.27	.21	.17	.15
10.0	.33	.24	.19	.31	.24	.19	.29	.22	.18	.27	.21	.17	.25	.19	.16	.14



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 35 / 57

ÖLÇÜM RAPORU MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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	.408	.232	.073	.394	.225	.071	.369	.212	.068	.346	.200	.064	.325	.188	.061	
2.0	.347	.190	.058	.335	.185	.057	.313	.174	.054	.292	.164	.051	.272	.154	.049	
3.0	.306	.163	.049	.295	.158	.048	.274	.149	.045	.255	.140	.043	.238	.132	.041	
4.0	.274	.142	.042	.264	.138	.041	.245	.130	.039	.228	.122	.037	.212	.115	.035	
5.0	.248	.126	.037	.239	.123	.036	.222	.115	.034	.206	.109	.032	.191	.102	.031	
6.0	.226	.113	.032	.218	.110	.032	.202	.104	.030	.188	.098	.029	.174	.092	.027	
7.0	.208	.103	.029	.201	.100	.028	.186	.094	.027	.173	.089	.026	.161	.083	.025	
8.0	.193	.094	.026	.186	.091	.026	.173	.086	.025	.160	.081	.023	.149	.076	.022	
9.0	.179	.087	.024	.173	.084	.024	.161	.079	.023	.149	.075	.021	.139	.070	.020	
10.0	.167	.080	.022	.162	.078	.022	.150	.074	.021	.140	.069	.020	.130	.065	.019	

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	.344	.344	.344	.294	.294	.294	.201	.201	.201	.115	.115	.115	.037	.037	.037	
1.0	.342	.310	.281	.292	.266	.242	.200	.183	.167	.115	.106	.097	.037	.034	.031	
2.0	.335	.287	.247	.287	.247	.213	.197	.171	.149	.114	.100	.087	.036	.032	.028	
3.0	.328	.271	.226	.281	.234	.196	.193	.162	.137	.111	.095	.081	.036	.031	.027	
4.0	.320	.259	.212	.275	.224	.184	.189	.156	.130	.109	.091	.077	.035	.030	.025	
5.0	.312	.249	.202	.268	.215	.176	.185	.151	.124	.107	.088	.074	.034	.029	.024	
6.0	.305	.241	.196	.262	.209	.170	.181	.146	.121	.105	.086	.072	.034	.028	.024	
7.0	.298	.235	.191	.256	.203	.166	.177	.143	.118	.103	.084	.070	.033	.028	.023	
8.0	.291	.229	.187	.250	.199	.163	.173	.140	.116	.101	.082	.069	.033	.027	.023	
9.0	.284	.224	.184	.245	.195	.160	.170	.137	.114	.099	.081	.068	.032	.027	.022	
10.0	.278	.220	.181	.240	.191	.158	.167	.135	.112	.097	.080	.067	.031	.026	.022	



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 36 / 57

ÖLÇÜM RAPORU MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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	10.5	11.9	11.1	12.5	13.1	9.3	10.6	9.8	11.2	11.8
3H	13.4	14.6	13.9	15.2	15.9	11.0	12.2	11.5	12.8	13.5
4H	14.9	16.2	15.5	16.8	17.4	11.6	12.9	12.2	13.5	14.1
6H	16.7	17.9	17.3	18.5	19.2	12.1	13.3	12.8	13.9	14.6
8H	17.7	18.8	18.3	19.4	20.1	12.3	13.5	13.0	14.1	14.8
12H	18.8	19.9	19.4	20.5	21.2	12.5	13.6	13.1	14.2	14.9
4H 2H	11.3	12.6	11.9	13.1	13.8	10.4	11.7	11.0	12.3	12.9
3H	14.4	15.4	15.0	16.1	16.8	12.6	13.6	13.2	14.3	15.0
4H	16.1	17.1	16.8	17.8	18.5	13.5	14.5	14.1	15.1	15.9
6H	18.1	19.0	18.8	19.6	20.4	14.2	15.1	14.9	15.8	16.6
8H	19.2	20.0	19.9	20.7	21.5	14.5	15.3	15.2	16.0	16.8
12H	20.4	21.2	21.1	21.9	22.7	14.7	15.5	15.4	16.2	17.0
8H 4H	16.7	17.5	17.4	18.2	19.0	14.7	15.5	15.4	16.2	17.0
6H	18.9	19.6	19.6	20.4	21.2	16.0	16.7	16.7	17.4	18.2
8H	20.2	20.9	21.0	21.6	22.5	16.5	17.2	17.3	17.9	18.8
12H	21.7	22.3	22.5	23.0	23.9	17.0	17.5	17.7	18.3	19.2
12H 4H	16.7	17.5	17.4	18.2	19.0	15.0	15.8	15.7	16.5	17.3
6H	19.1	19.8	19.9	20.5	21.4	16.6	17.2	17.3	18.0	18.8
8H	20.6	21.1	21.3	21.9	22.8	17.4	18.0	18.2	18.7	19.6
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.1					+ 0.1 / - 0.1				
1.5H	+ 0.2 / - 0.3					+ 0.1 / - 0.2				
2.0H	+ 0.3 / - 0.4					+ 0.2 / - 0.3				

CIE Pub.117 Corrected 257.2 lm Total Lamp Luminous Flux. (8log(F/F0) = -4.7)



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 37 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

2.5 RGB renk Fotometrik Deney Sonuçları (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) $k(RI) \times RCR = 5$									
$k = 0.60$	45	33	25	44	32	25	42	31	25	18
0.80	54	41	33	53	40	32	50	39	31	23
1.00	62	48	40	60	47	39	56	48	38	29
1.25	69	56	47	67	54	46	62	52	44	34
1.50	74	61	52	71	59	51	66	56	49	38
2.00	82	70	61	78	68	59	72	64	57	45
2.50	86	75	67	83	73	65	76	68	62	48
3.00	90	80	72	86	77	70	79	72	66	52
4.00	95	86	79	91	83	77	83	77	72	57
5.00	98	91	84	94	87	81	86	81	76	60
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004										
Suspended										
SHRNOM = 1.25										



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 38 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

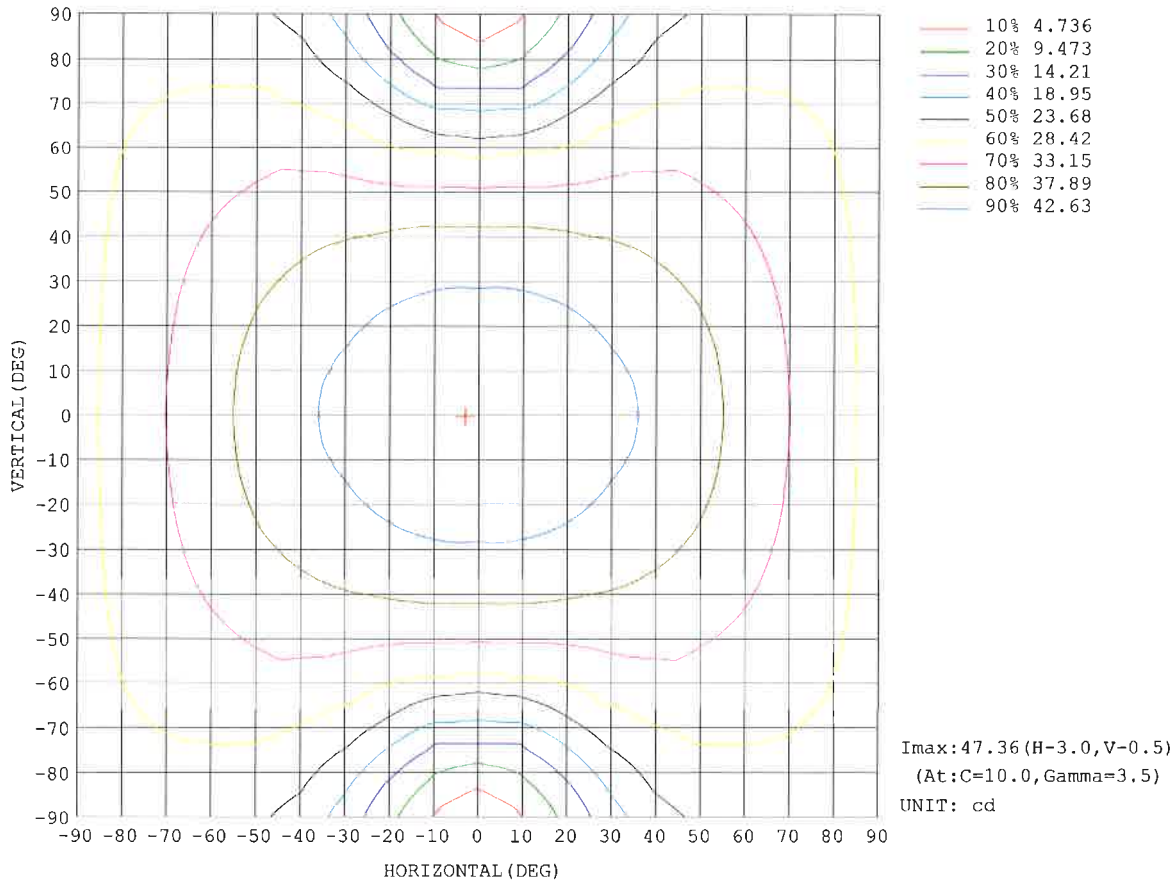
TL-806

19-TST-0039-
44/R1

03-19

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

ISOCANDELA DIAGRAM



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

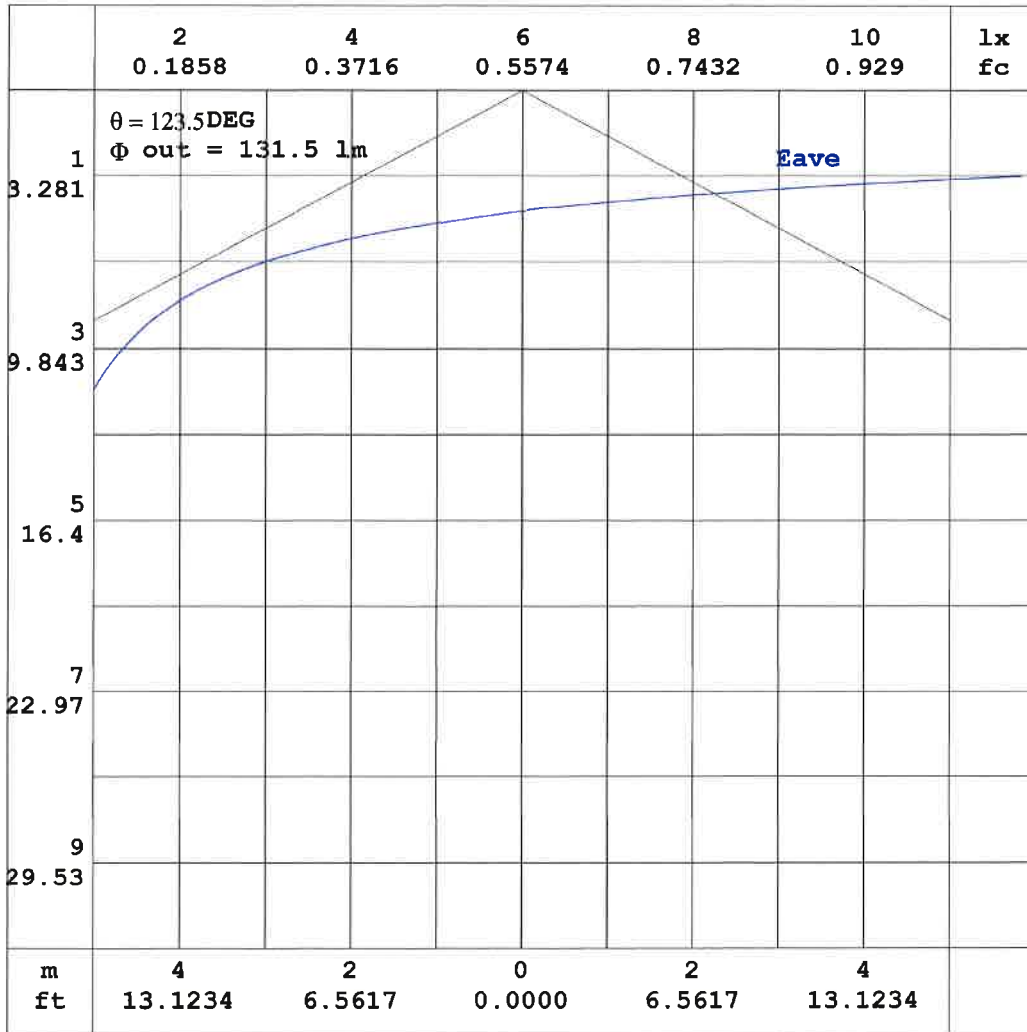
Sayfa / Page : 39 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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.



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 40 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

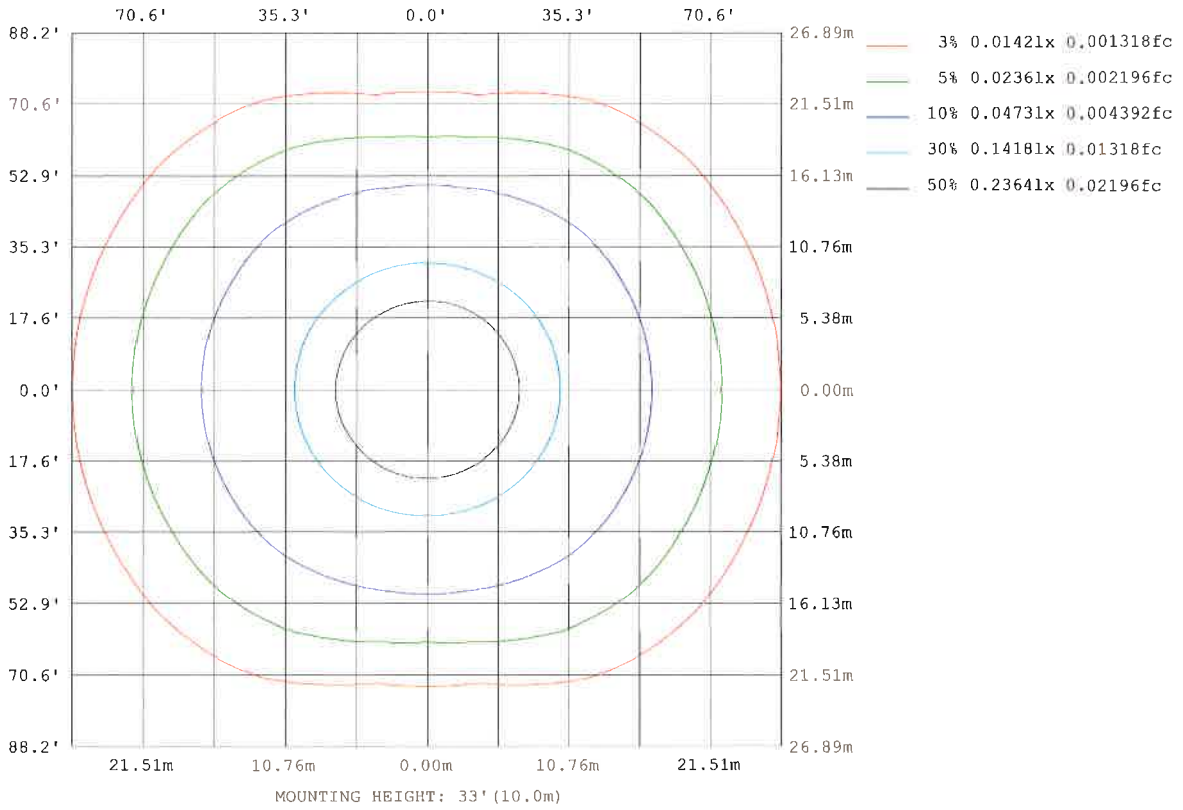
TL-806

19-TST-0039-
44/R1

03-19

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

ISOLUX DIAGRAM



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 41 / 57

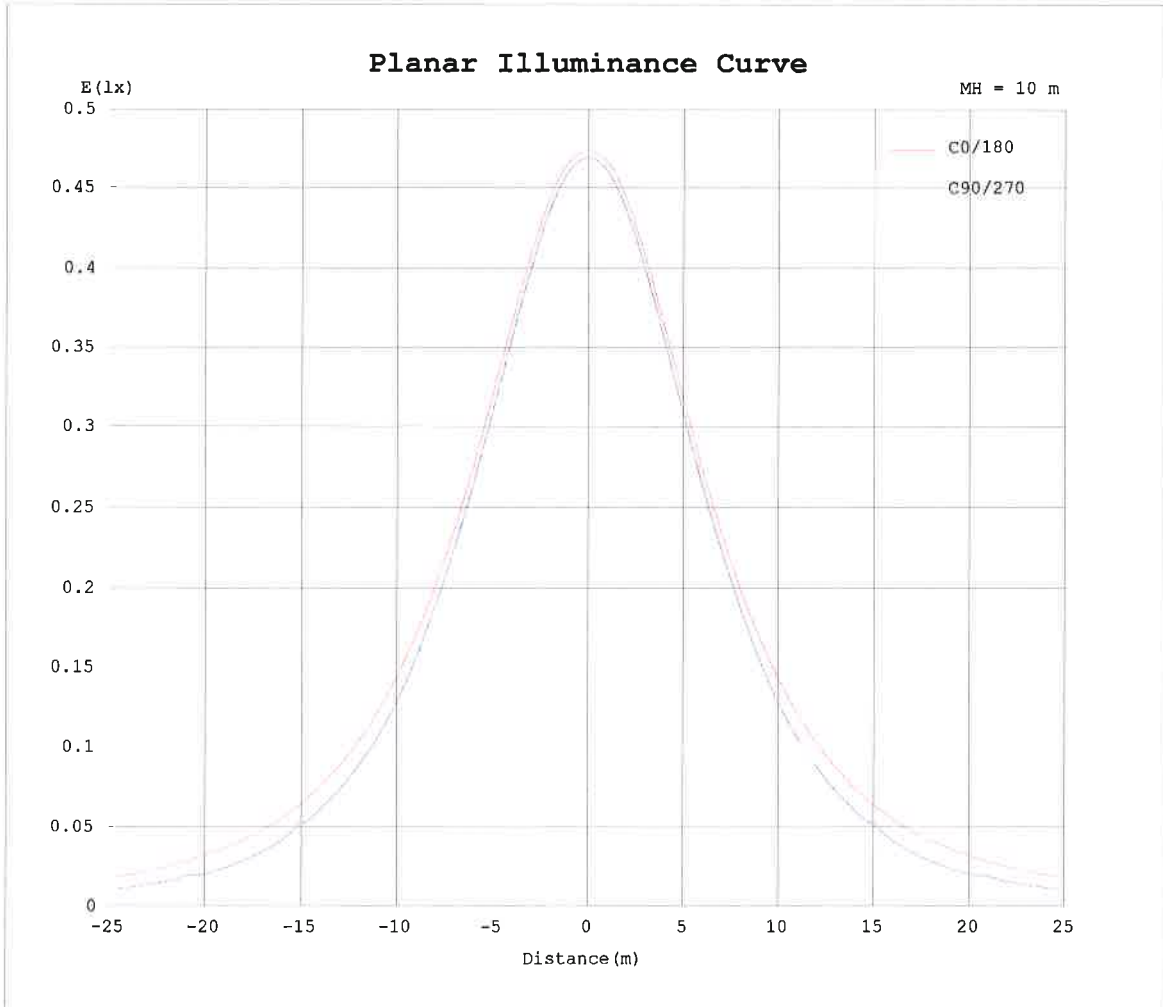
ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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



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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 42 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

2.6 RGB Renk Spektrokolorimetrik Deneş Sonuřları (Spectrocolorimetric Test Results of the RGB color)

Elektriksel Ölçümler

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	16,32
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,34
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 Sonuřları

(Spectrocolorimetric Measurement Results)

Chrom x	0.2622
Chrom y	0.3050
Duv	0.0197
Chrom u'	0.1710
Chrom v'	0.4474
Peak	469 nm
Dominant	486 nm
CCT	Not applicable
Nominal CCT	4000 K
Ra(CRI)	56
R9	-133
S/P Ratio	3,7
Preburning time	1 hr
Test Configuration	4T



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 43 / 57

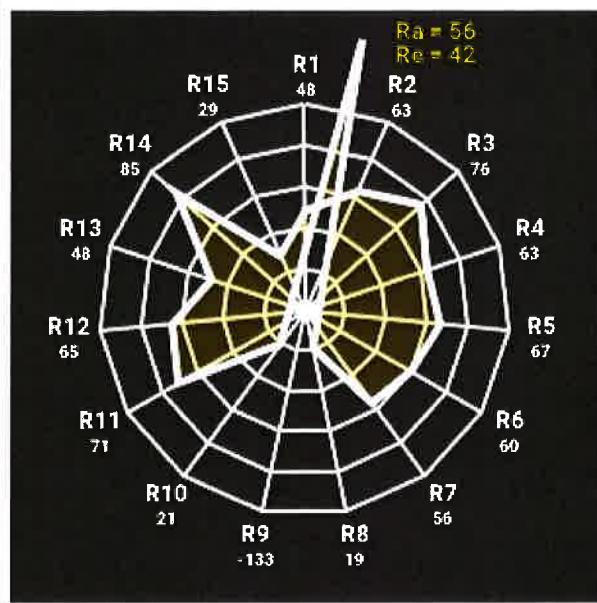
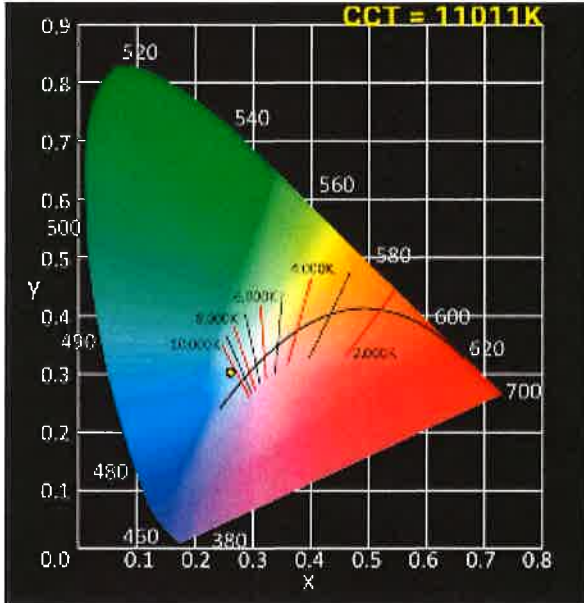
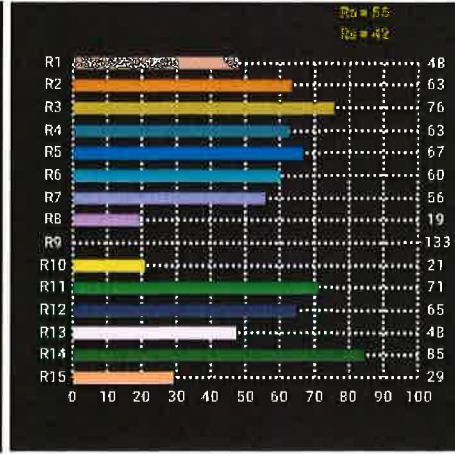
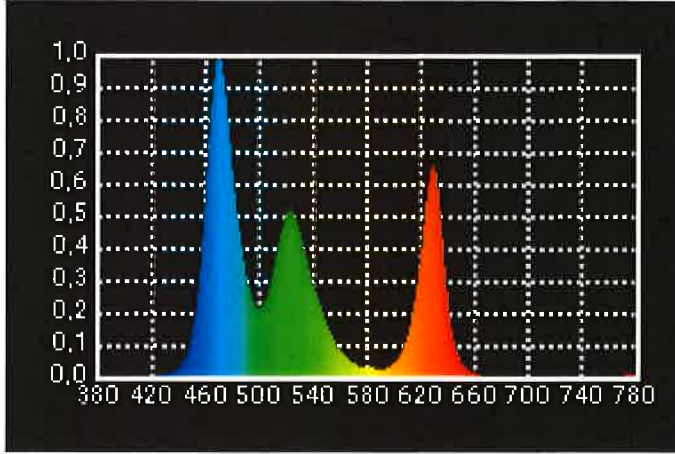
TL-806

19-TST-0039-
44/R1

03-19

ÖLÇÜM RAPORU
MEASUREMENT REPORT

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



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 44 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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

Elektriksel Ölçümler

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,536
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1570
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)	175,16
Maksimum Işık Şiddeti (Max. Light Intensity) (cd)	32,18
Armatür Etkinliği (Luminaire Efficacy) (lm/W)	23,24



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 45 / 57

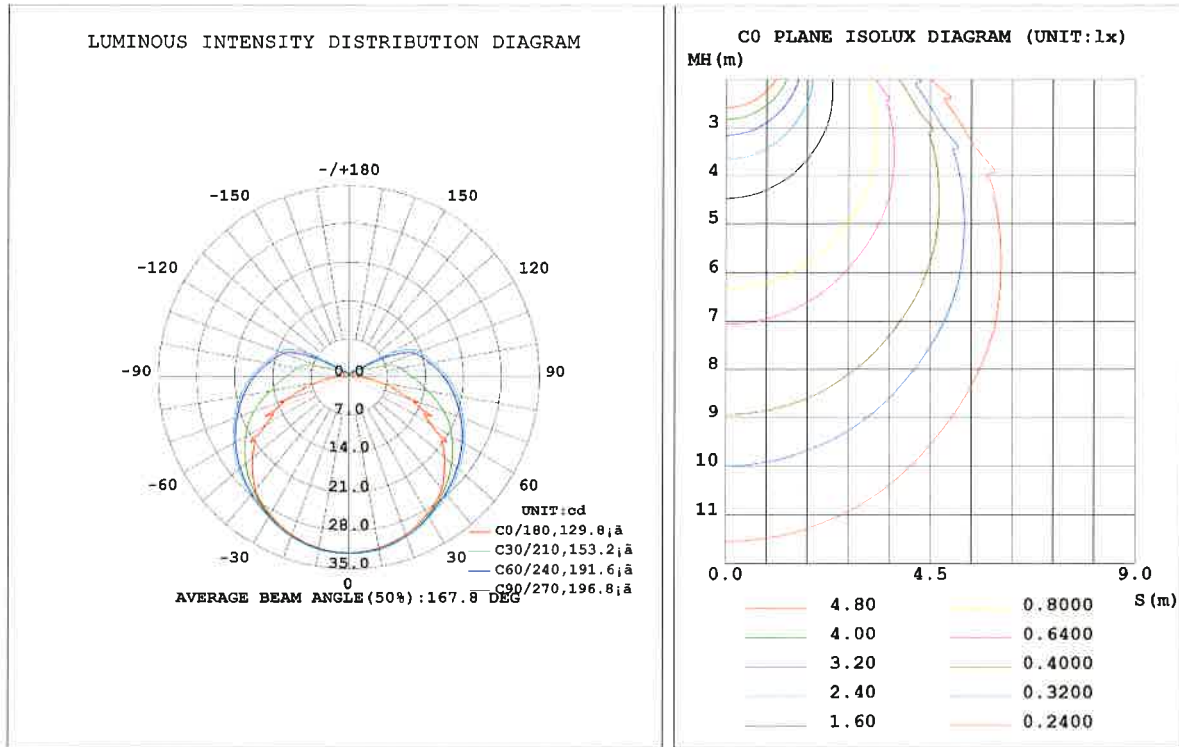
ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 46 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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

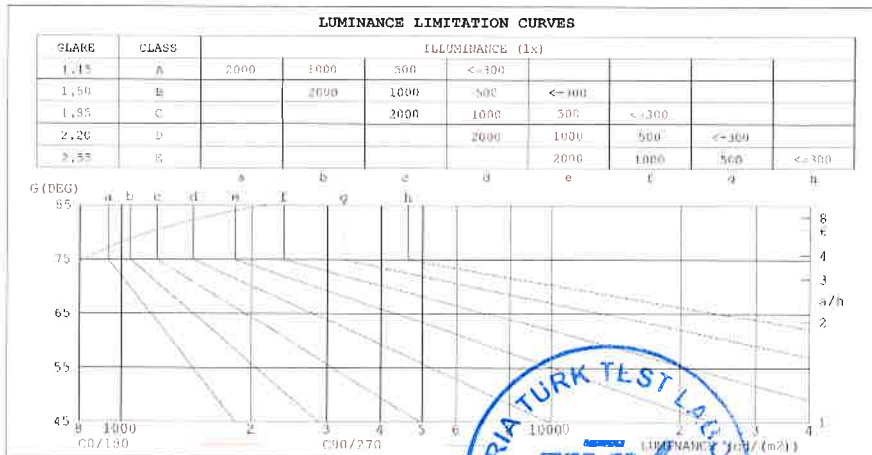
**ZONAL FLUX DIAGRAM
AND LUMINANCE LIMITATION CURVES**

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
5	31.91	32.06	32.13	32.06	31.91	32.06	32.13	32.06	0- 5	0.7663	0.7663	0.44,0.44
10	31.67	31.84	31.90	31.84	31.67	31.84	31.90	31.84	5- 10	2.283	3.050	1.74,1.74
15	31.24	31.46	31.50	31.46	31.24	31.46	31.50	31.46	10- 15	3.750	6.799	3.92,3.88
20	30.60	30.88	30.91	30.88	30.60	30.88	30.91	30.88	15- 20	5.127	11.93	6.81,6.81
25	29.77	30.16	30.21	30.16	29.77	30.16	30.21	30.16	20- 25	6.387	18.31	10.5,10.5
30	28.87	29.29	29.40	29.29	28.87	29.29	29.40	29.29	25- 30	7.501	25.81	14.7,14.7
35	27.90	28.29	28.77	28.29	27.90	28.29	28.77	28.29	30- 35	8.469	34.28	19.6,19.6
40	26.66	27.27	28.05	27.27	26.66	27.27	28.05	27.27	35- 40	9.293	43.58	24.9,24.9
45	24.88	26.36	27.23	26.36	24.88	26.36	27.23	26.36	40- 45	9.939	53.51	30.6,30.6
50	23.03	25.44	26.37	25.44	23.03	25.44	26.37	25.44	45- 50	10.39	63.90	36.5,36.5
55	20.81	24.46	25.44	24.46	20.81	24.46	25.44	24.46	50- 55	10.64	74.54	42.6,42.6
60	17.51	23.41	24.45	23.41	17.51	23.41	24.45	23.41	55- 60	10.70	85.24	48.7,48.7
65	15.74	22.28	23.38	22.28	15.74	22.28	23.38	22.28	60- 65	10.45	95.70	54.6,54.6
70	12.64	21.08	22.30	21.08	12.64	21.08	22.30	21.08	65- 70	10.06	105.8	60.4,60.4
75	8.465	19.84	21.28	19.84	8.465	19.84	21.28	19.84	70- 75	9.515	115.3	65.8,65.8
80	5.280	18.62	20.25	18.62	5.280	18.62	20.25	18.62	75- 80	8.811	124.2	70.9,70.9
85	2.691	17.40	19.15	17.40	2.691	17.40	19.15	17.40	80- 85	8.179	132.3	75.6,75.6
90	0.3314	16.11	18.00	16.11	0.3314	16.11	18.00	16.11	85- 90	7.482	139.8	79.8,79.8
95	0.2801	14.86	16.86	14.86	0.2801	14.86	16.86	14.86	90- 95	6.827	146.7	83.7,83.7
100	0.5312	13.70	15.73	13.70	0.5312	13.70	15.73	13.70	95-100	6.247	152.9	87.3,87.3
105	0.7152	12.53	14.64	12.53	0.7152	12.53	14.64	12.53	100-105	5.631	158.5	90.5,90.5
110	0.8377	10.60	13.55	10.60	0.8377	10.60	13.55	10.60	105-110	4.875	163.4	93.3,93.3
115	0.9563	7.045	12.11	7.045	0.9563	7.045	12.11	7.045	110-115	3.947	167.4	95.5,95.5
120	1.080	3.935	8.784	3.935	1.080	3.935	8.784	3.935	115-120	2.799	170.2	97.1,97.1
125	1.201	2.589	4.704	2.589	1.201	2.589	4.704	2.589	120-125	1.713	171.9	98.1,98.1
130	1.157	2.079	1.960	2.079	1.157	2.079	1.960	2.079	125-130	0.9840	172.9	98.7,98.7
135	0.9962	1.758	1.228	1.758	0.9962	1.758	1.228	1.758	130-135	0.6568	173.5	99.1,99.1
140	0.8616	1.465	1.030	1.465	0.8616	1.465	1.030	1.465	135-140	0.4910	174.0	99.1,99.1
145	0.7248	1.212	0.8851	1.212	0.7248	1.212	0.8851	1.212	140-145	0.3707	174.4	99.5,99.5
150	0.5968	0.9869	0.7710	0.9869	0.5968	0.9869	0.7710	0.9869	145-150	0.2744	174.6	99.7,99.7
155	0.4981	0.7959	0.6787	0.7959	0.4981	0.7959	0.6787	0.7959	150-155	0.1978	174.8	99.8,99.8
160	0.3916	0.6404	0.5922	0.6404	0.3916	0.6404	0.5922	0.6404	155-160	0.1357	175.0	99.9,99.9
165	0.2900	0.5194	0.5077	0.5194	0.2900	0.5194	0.5077	0.5194	160-165	0.0876	175.1	99.9,99.9
170	0.4320	0.4833	0.4294	0.4833	0.4320	0.4833	0.4294	0.4833	165-170	0.0531	175.1	100,100
175	0.4919	0.4722	0.4053	0.4722	0.4919	0.4722	0.4053	0.4722	170-175	0.0336	175.2	100,100
180	0.4575	0.4675	0.2459	0.4675	0.4575	0.4675	0.2459	0.4675	175-180	0.0112	175.2	100,100

LUMINOUS INTENSITY:cd

UNIT:lm



LUMINANCE cd/(m2)

G (DEG)	C0/180	C90/270
85	309	2197
80	304	1166
75	327	822
70	370	652
65	372	553
60	350	489
55	363	444
50	358	410
45	352	385

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

This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.

Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 47 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

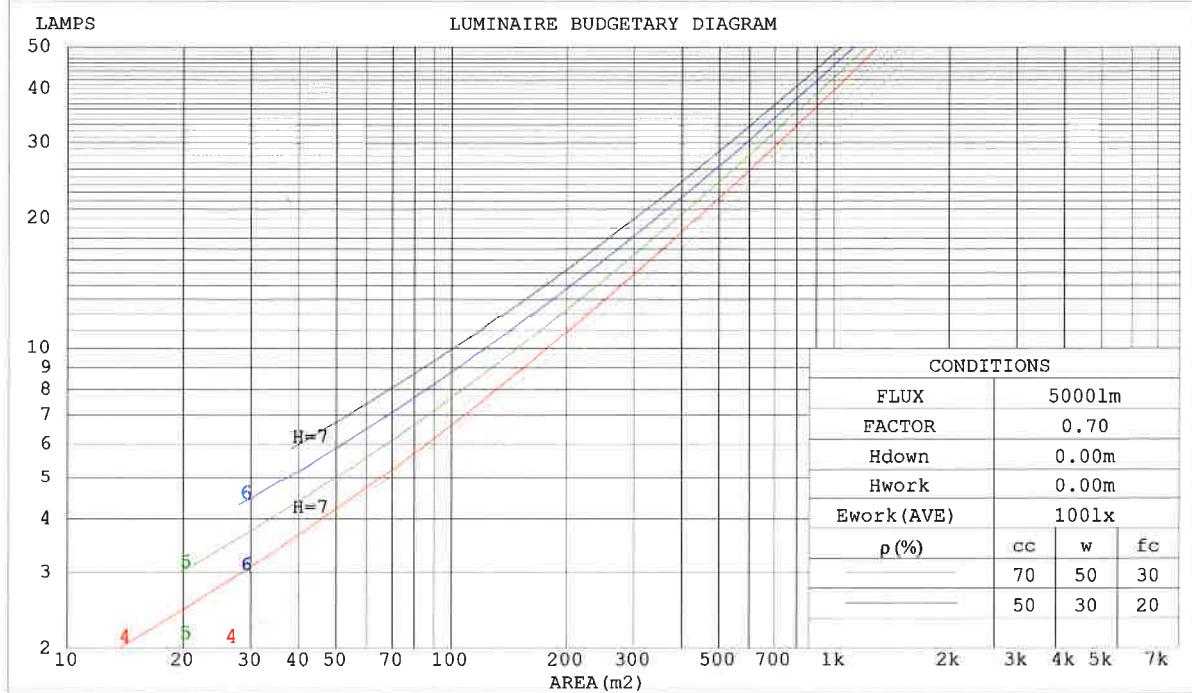
19-TST-0039-
44/R1

03-19

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
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						Coefficients of Utilization(CU)									
0.0	1.14	1.14	1.14	1.09	1.09	1.09	.00	.00	.00	.91	.91	.91	.84	.84	.84	.80
1.0	.94	.88	.83	.90	.84	.80	.82	.77	.74	.74	.71	.68	.67	.65	.62	.59
2.0	.80	.72	.65	.76	.69	.62	.69	.63	.58	.63	.58	.53	.57	.53	.49	.46
3.0	.69	.60	.52	.66	.57	.50	.60	.53	.47	.54	.48	.43	.49	.44	.40	.37
4.0	.60	.51	.43	.57	.49	.42	.52	.45	.39	.48	.41	.36	.43	.38	.34	.31
5.0	.53	.44	.36	.51	.42	.35	.46	.39	.33	.42	.36	.31	.38	.33	.29	.26
6.0	.48	.38	.31	.46	.37	.30	.42	.34	.28	.38	.32	.27	.35	.29	.25	.22
7.0	.43	.34	.27	.41	.32	.26	.38	.30	.25	.34	.28	.23	.31	.26	.22	.19
8.0	.39	.30	.24	.37	.29	.23	.34	.27	.22	.31	.25	.21	.29	.23	.19	.17
9.0	.35	.27	.21	.34	.26	.21	.31	.24	.19	.29	.23	.18	.27	.21	.17	.15
10.0	.33	.24	.19	.31	.24	.19	.29	.22	.18	.27	.21	.17	.25	.19	.16	.14



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 48 / 57

TL-806

19-TST-0039-
44/R1

03-19

ÖLÇÜM RAPORU
MEASUREMENT REPORT**2.7 Yeşil renk Fotometrik Deney Sonuçları (Photometric Test Results of the Green color)****WEC AND CCEC**

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	.408	.232	.074	.395	.225	.071	.369	.212	.068	.346	.200	.064	.325	.188	.061	
2.0	.348	.190	.058	.335	.185	.057	.313	.174	.054	.292	.164	.051	.272	.154	.049	
3.0	.306	.163	.049	.295	.158	.048	.274	.149	.045	.255	.140	.043	.238	.132	.041	
4.0	.274	.142	.042	.264	.138	.041	.245	.130	.039	.228	.122	.037	.212	.115	.035	
5.0	.248	.126	.037	.239	.123	.036	.222	.115	.034	.206	.109	.032	.191	.102	.031	
6.0	.226	.113	.032	.218	.110	.032	.202	.104	.030	.188	.098	.029	.174	.092	.027	
7.0	.208	.103	.029	.201	.100	.028	.186	.094	.027	.173	.089	.026	.160	.083	.025	
8.0	.193	.094	.026	.186	.091	.026	.173	.086	.025	.160	.081	.023	.149	.076	.022	
9.0	.179	.087	.024	.173	.084	.024	.161	.079	.023	.149	.075	.021	.139	.070	.020	
10.0	.167	.080	.022	.162	.078	.022	.150	.074	.021	.140	.069	.020	.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	.344	.344	.344	.294	.294	.294	.201	.201	.201	.115	.115	.115	.037	.037	.037	
1.0	.342	.310	.282	.293	.266	.242	.200	.183	.168	.115	.106	.097	.037	.034	.032	
2.0	.336	.288	.247	.288	.248	.214	.197	.171	.149	.114	.100	.087	.036	.032	.028	
3.0	.328	.271	.226	.281	.234	.196	.193	.163	.137	.112	.095	.081	.036	.031	.027	
4.0	.320	.259	.212	.275	.224	.184	.189	.156	.130	.109	.091	.077	.035	.030	.025	
5.0	.313	.249	.203	.269	.216	.176	.185	.151	.124	.107	.088	.074	.035	.029	.024	
6.0	.305	.242	.196	.262	.209	.171	.181	.146	.121	.105	.086	.072	.034	.028	.024	
7.0	.298	.235	.191	.256	.204	.166	.177	.143	.118	.103	.084	.070	.033	.028	.023	
8.0	.291	.229	.187	.251	.199	.163	.173	.140	.116	.101	.082	.069	.033	.027	.023	
9.0	.285	.225	.184	.245	.195	.161	.170	.137	.114	.099	.081	.068	.032	.027	.023	
10.0	.279	.221	.182	.240	.191	.159	.167	.135	.113	.097	.080	.067	.032	.026	.022	



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 49 / 57

TL-806

19-TST-0039-
44/R1

03-19

ÖLÇÜM RAPORU MEASUREMENT REPORT

2.7 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	8.0	9.4	8.5	9.9	10.5	9.1	10.5	9.7	11.1	11.7
3H	9.7	11.0	10.3	11.6	12.2	11.9	13.2	12.5	13.8	14.5
4H	10.4	11.6	11.0	12.2	12.9	13.5	14.7	14.1	15.3	16.0
6H	10.9	12.0	11.5	12.6	13.3	15.3	16.4	15.9	17.0	17.7
8H	11.1	12.2	11.7	12.8	13.5	16.3	17.4	16.9	18.0	18.7
12H	11.2	12.3	11.9	12.9	13.7	17.4	18.5	18.0	19.1	19.8
4H 2H	9.2	10.4	9.8	11.0	11.7	10.0	11.2	10.5	11.8	12.4
3H	11.3	12.4	11.9	13.0	13.7	13.0	14.0	13.6	14.7	15.4
4H	12.2	13.2	12.9	13.9	14.6	14.7	15.7	15.4	16.4	17.1
6H	13.0	13.8	13.6	14.5	15.3	16.7	17.6	17.3	18.2	19.0
8H	13.2	14.1	13.9	14.8	15.6	17.8	18.6	18.4	19.3	20.1
12H	13.4	14.2	14.2	14.9	15.7	19.0	19.8	19.7	20.5	21.3
8H 4H	13.4	14.2	14.1	14.9	15.7	15.3	16.1	16.0	16.8	17.6
6H	14.7	15.4	15.4	16.1	17.0	17.5	18.2	18.3	19.0	19.8
8H	15.3	15.9	16.0	16.6	17.5	18.8	19.5	19.6	20.2	21.1
12H	15.7	16.3	16.4	17.0	17.9	20.3	20.9	21.1	21.6	22.5
12H 4H	13.8	14.5	14.5	15.2	16.0	15.4	16.1	16.1	16.8	17.7
6H	15.3	16.0	16.1	16.7	17.6	17.8	18.4	18.5	19.1	20.0
8H	16.1	16.7	16.9	17.4	18.3	19.2	19.7	19.9	20.5	21.4
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.1					+ 0.1 / - 0.1				
1.5H	+ 0.1 / - 0.2					+ 0.2 / - 0.3				
2.0H	+ 0.2 / - 0.3					+ 0.3 / - 0.4				

CIE Pub.117 Corrected 175.2 lm Total Lamp Luminous Flux. (8log(F/F0) = -6.1)



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 50 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

2.7 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	45	33	25	44	32	25	42	31	25	18
0.80	54	41	32	53	40	32	50	39	31	23
1.00	62	48	40	60	47	39	56	48	38	29
1.25	69	56	47	66	54	46	62	52	44	34
1.50	74	61	52	71	59	51	66	56	49	38
2.00	81	70	61	78	68	59	72	64	57	44
2.50	86	75	67	83	73	65	76	68	61	48
3.00	90	80	72	86	77	70	79	72	66	52
4.00	95	86	79	91	83	77	83	77	72	57
5.00	98	91	84	94	87	81	86	81	76	60
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNM = 1.25			



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 51 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

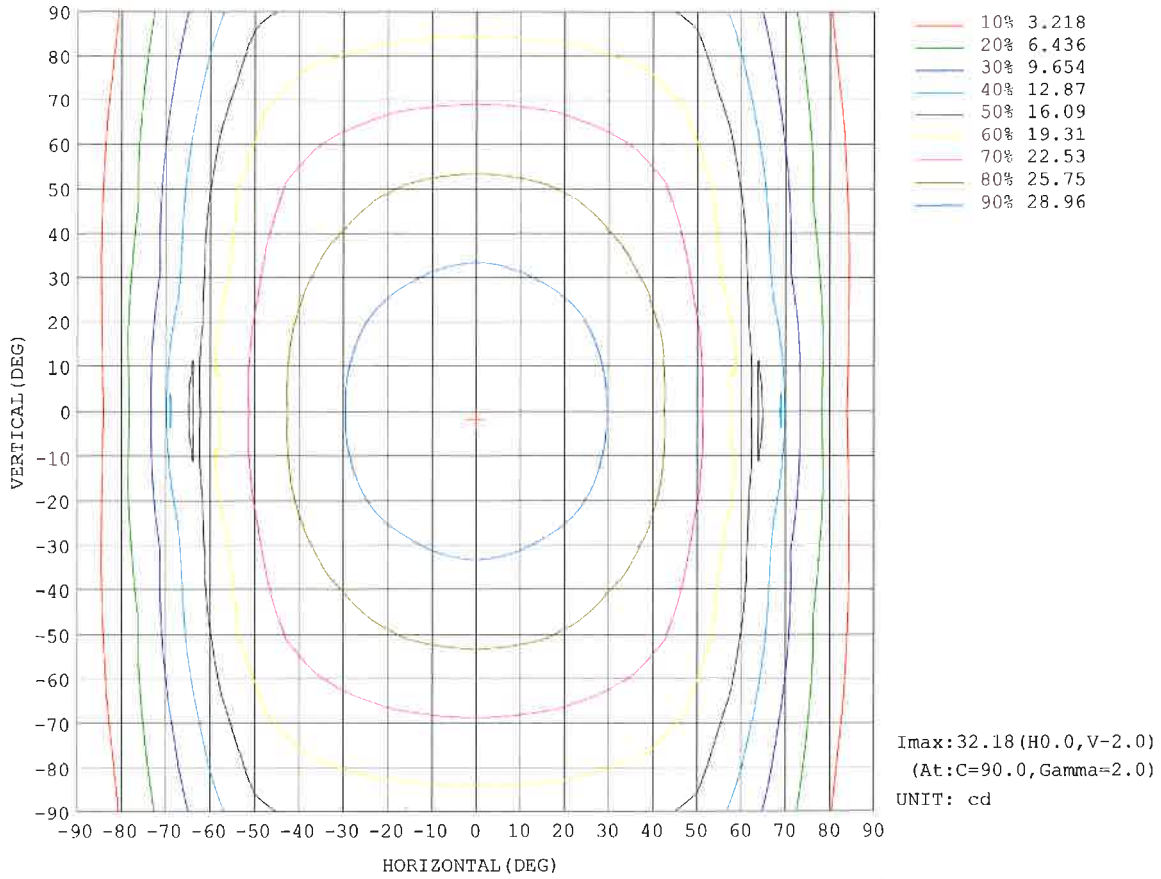
TL-806

19-TST-0039-
44/R1

03-19

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

ISOCANDELA DIAGRAM



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 52 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

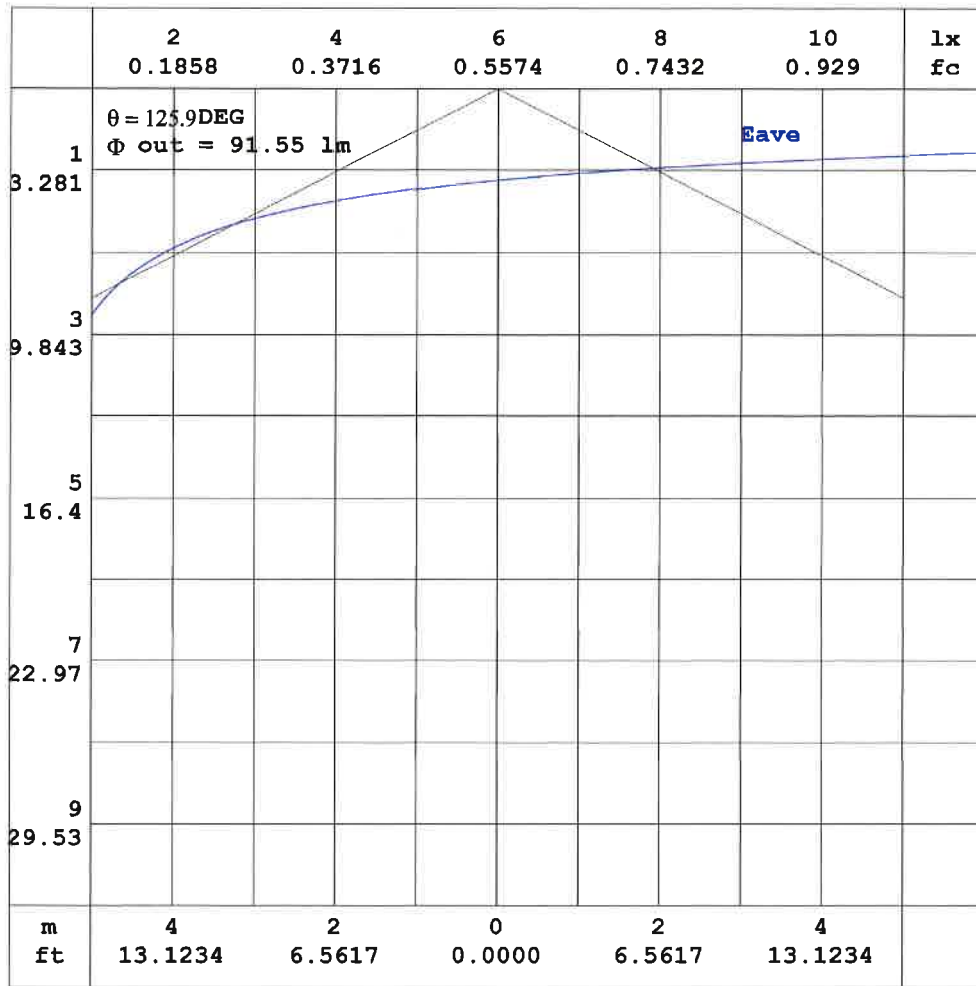
TL-806

19-TST-0039-
44/R1

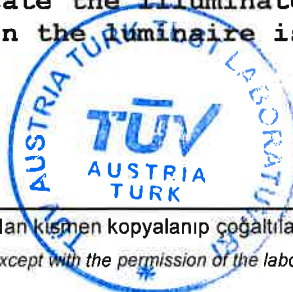
03-19

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.



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 53 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

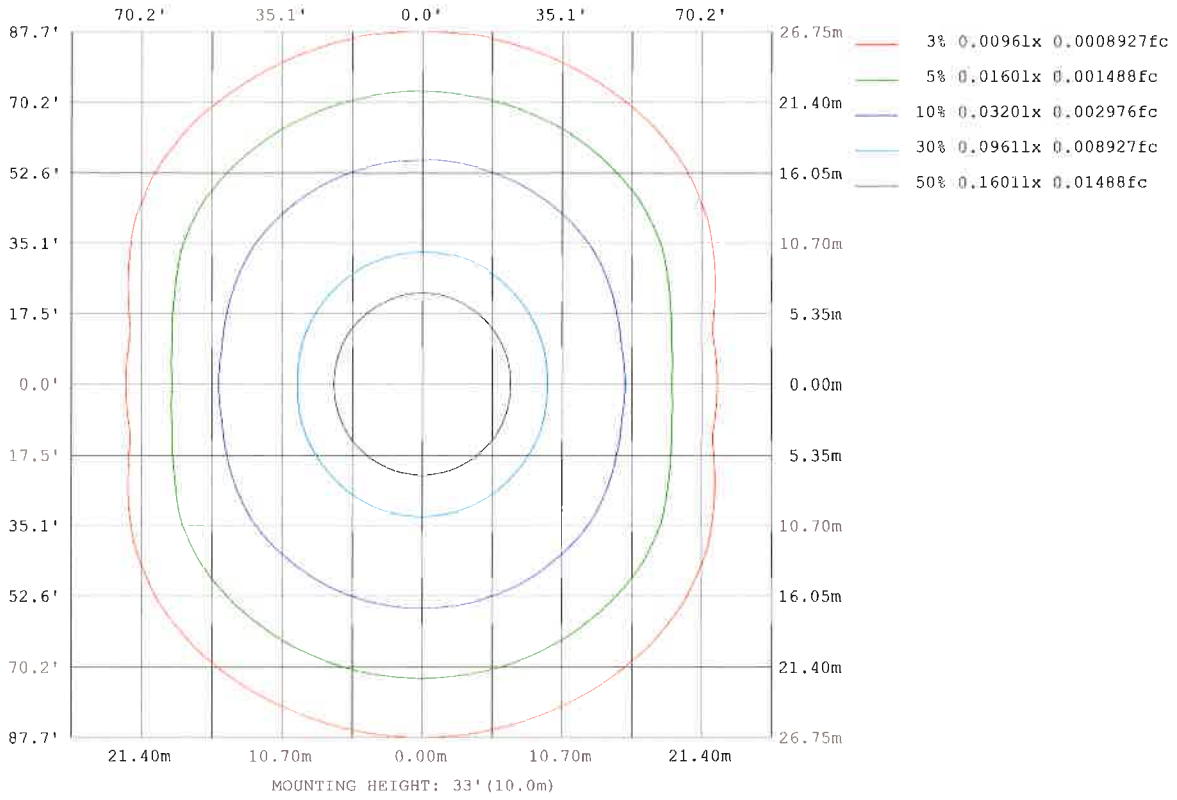
TL-806

19-TST-0039-
44/R1

03-19

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

ISOLUX DIAGRAM



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 54 / 57

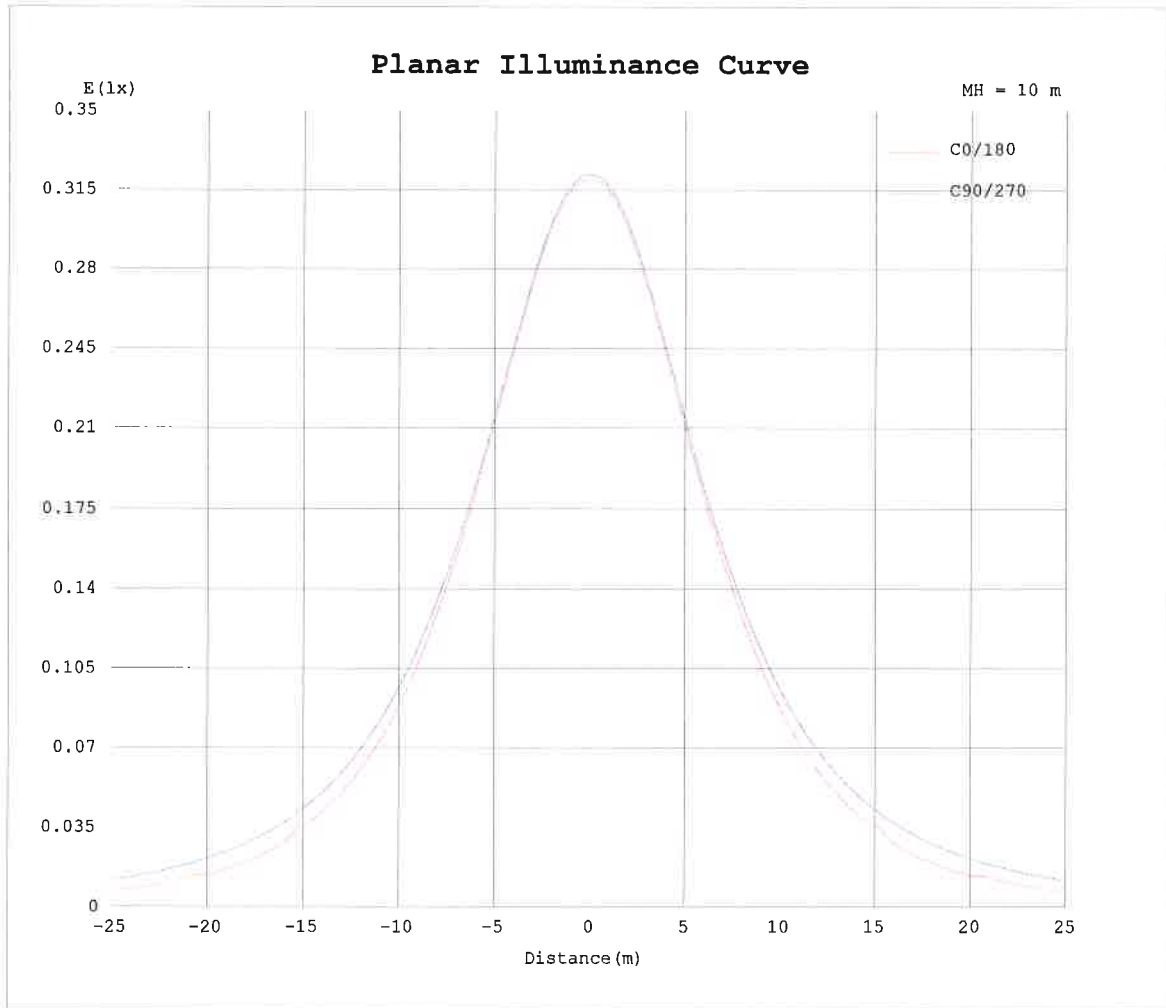
ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0039-
44/R1

03-19

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



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 55 / 57

TL-806

19-TST-0039-
44/R1

03-19

ÖLÇÜM RAPORU
MEASUREMENT REPORT**2.8 Yeşil Renk Spektrokolorimetrik Deney Sonuçları (Spectrocolorimetric Test Results of the Green color)****Elektriksel Ölçümler**

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	7,536
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,1570
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 Sonuçları

(Spectrocolorimetric Measurement Results)

Chrom x	0,1938
Chrom y	0,7210
Duv	0,1504
Chrom u'	0,0668
Chrom v'	0,5761
Peak	523 nm
Dominant	531 nm
CCT	7457 K
Nominal CCT	-
Ra(CRI)	0
R9	0
S/P Ratio	2,5
Preburning time	1 hr
Test Configuration	4π



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 56 / 57

ÖLÇÜM RAPORU
MEASUREMENT REPORT

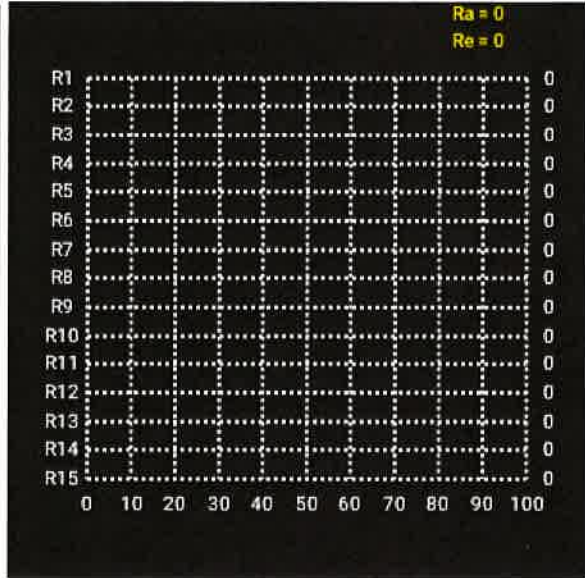
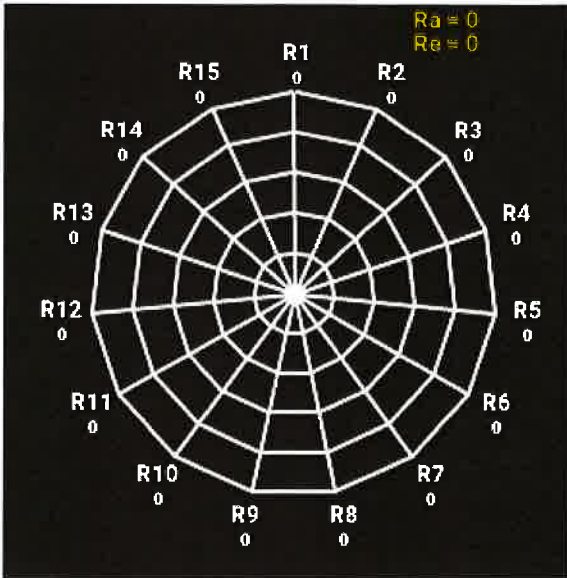
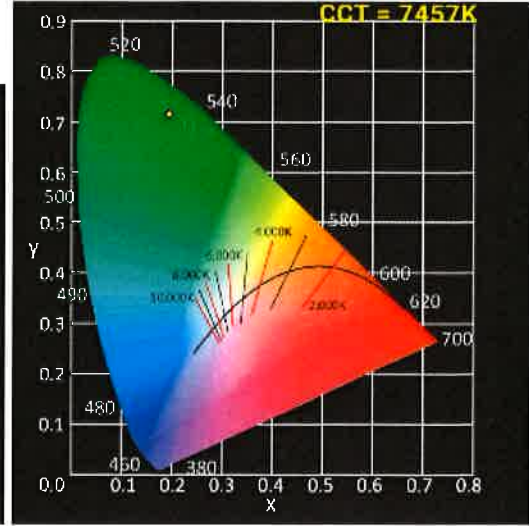
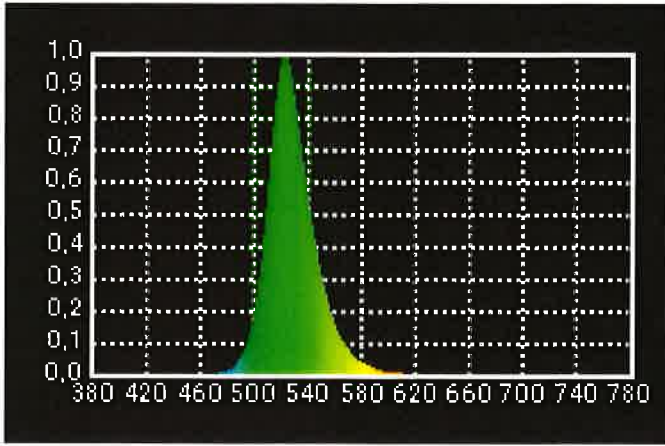
TL-806

19-TST-0039-
44/R1

03-19

2.8

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



Doc No: FRM-LAB-009a

Rev.No/Date: 02 / 11.01.2019

Sayfa / Page : 57 / 57

TL-806

19-TST-0039-
44/R1

03-19

ÖLÇÜM RAPORU
MEASUREMENT REPORT

3.1 DGC'nin Fotoğrafları (Photos of EUT)

