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**ÖLÇÜM RAPORU**  
MEASUREMENT REPORT

TL-806

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**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-0095

**Numunenin Adı ve Tarifi**  
Name and identity of test item

: Leoline® S12 915mm DMX RGBA Linear Spot Beam 14°

**Numunenin kabul tarihi**  
The date of receipt of test item

: 31.07.2019

**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

: 31.07.2019

**Raporun Sayfa Sayısı**  
Number of Pages of the Report

:18

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.



**Deney Sorumlusu**  
Person in charge of test

Gürhan CANSIZ

**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**

: Leoline® S12 915mm DMX  
RGBA Linear Spot Beam 14°

**Seri Numarası / Serial Number**

: Test Numunesi  
Test Sample

**Beyan Gücü / Rated Power**

: 49,4 W

**Beyan Gerilimi / Rated Voltage**

: 48 VDC

**Sembollerin Tanımı / Definitions of Symbols**

DGC= Deneyden Geçen Cihaz  
EUT=Equipment Under Test



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**1.2 Deney Standartları (Test Standards)**

Deneyler 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	05.06.2020	<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	28.05.2020	<input checked="" type="checkbox"/>

**1.3 Komponent listesi (Component list)**

Komponent (Component)	Üretici (Manufacturer)	Model (Model)	Teknik Bilgi (Technical Data)	Standart no. (Standart No.)
LED	Cree Inc	CLQ6A-YKW	Binned at 85 °C • Thermal resistance: 5 °C/W • Wide viewing angle: 110°-140° Unlimited floor life at ≤ 30 °C/85% RH Maximum drive current: 1 A	UL (E349212) RoHS REACH
PCB	PCB	C13093_R1.0	0.8mm FR4 4 Layers 35+35+35+35umCu/ Black Solder Mask/White Silk Screen	IPC A 600 J Class II Revizyon J standartı (COC) IPC 6012 Class II UL FQC
LENS	LEDIL	CA11016_TINA2-BS-14	Dimensions Ø 16.1 mm Height 9.7 mm	ANSI/ESD S20.20:2014 EN 61340-5- 1:2007



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**2.1 RGBA Fotometrik Deney Sonuçları (Photometric Test Results of the RGBA)**

**Elektriksel Ölçümler**

(Electrical Measurements)

<b>Ölçülen Güç (W)</b> (Input Power)	47,20 W
<b>Ölçülen Gerilim (V)</b> (Input Voltage)	46,76 VDC
<b>Ölçülen Akım (A)</b> (Input Current)	1,01 A
<b>Güç Faktörü (PF)</b> (Power Factor)	-
<b>Ölçülen Frekans (Hz)</b> (Input Frequency)	-
<b>Ortam Sıcaklığı / Bağıl Nem</b> (Ambient Temperature / Relative Humidity)	25,1 °C 46% Rh
<b>Stabilizasyon Süresi</b> (Stabilization Time)	60 dk ±5dk

**Fotometrik Ölçüm Sonuçları**

(Photometric Measurement Results)

<b>Toplam Işık Akısı</b> (Total Luminous Flux) (lm)	1540,8
<b>Maksimum Işık Şiddeti</b> (Max. Light Intensity) (cd)	16545
<b>Armatür Etkinliği</b> (Luminaire Efficacy) (lm/W)	32,64



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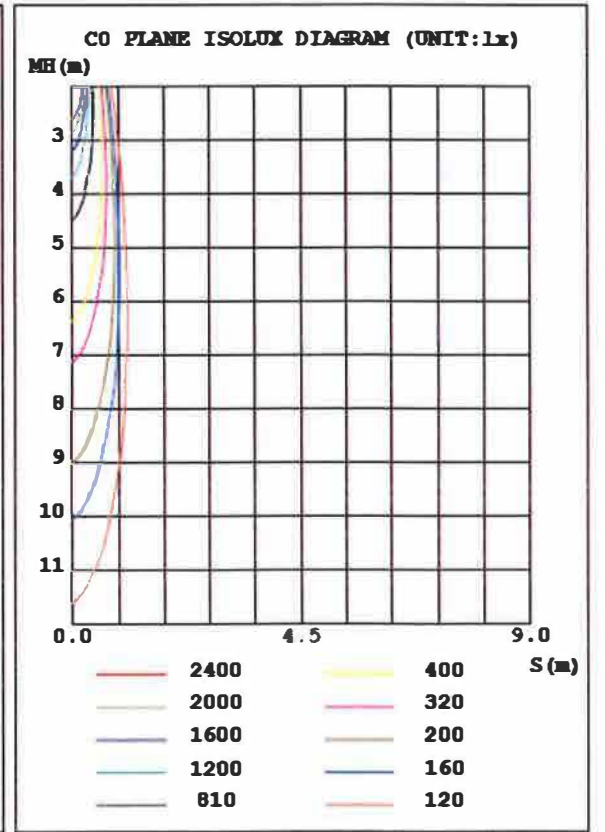
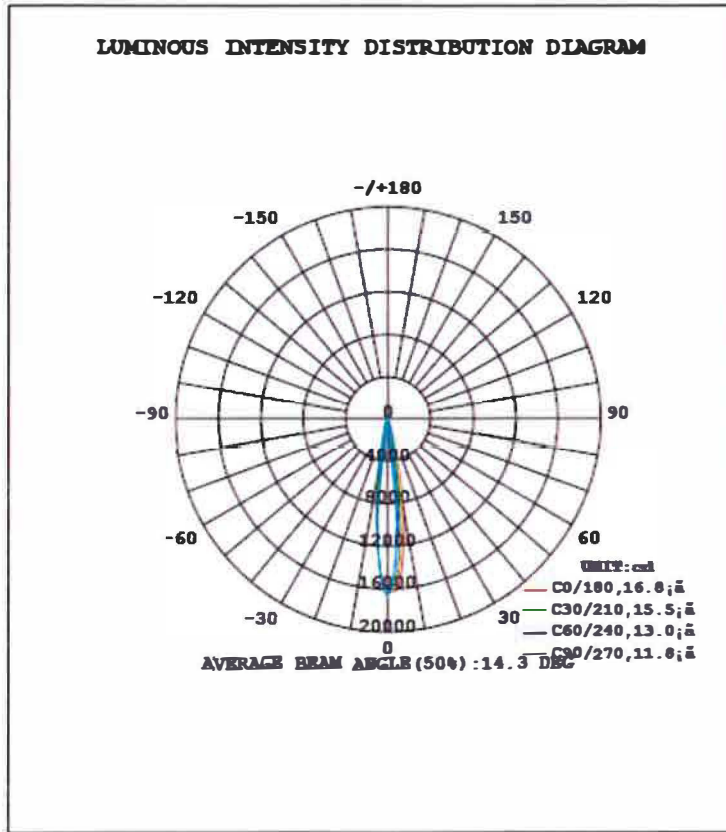
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**2.1 RGBa Fotometrik Deney Sonuçları (Photometric Test Results of the RGBa)**



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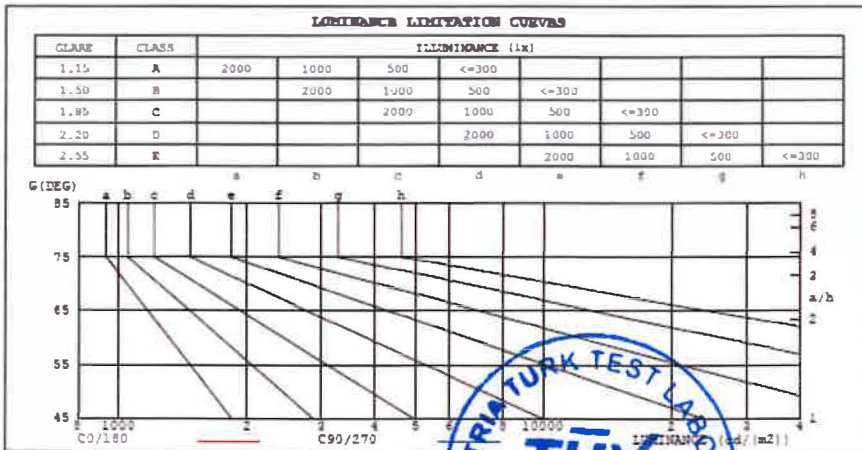
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**2.1 RGBa Fotometrik Deney Sonuçları (Photometric Test Results of the RGBa)**

**ZONAL FLUX DIAGRAM**  
**AND LUMINANCE LIMITATION CURVES**

**ZONAL FLUX DIAGRAM:**

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi_{\text{zone}}$	$\Phi_{\text{total}}$	Limit. Lamp
5	1096	1062	999.9	1242	1442	1242	999.9	1062	0- 5	326.8	226.8	21.2.21.2
10	471.9	398.9	332.8	499.7	778.4	499.7	332.8	398.9	5- 10	527.8	654.6	55.5.55.5
15	169.8	142.8	117.8	169.4	282.4	169.4	117.8	142.8	10- 15	328.0	1162	76.6.76.6
20	66.96	41.67	35.39	44.29	76.48	44.29	35.39	41.67	15- 20	168.4	1348	87.5.87.5
25	28.97	27.21	17.41	24.64	24.64	24.64	17.41	27.21	20- 25	82.38	1430	88.8.88.8
30	10.38	11.99	7.613	11.20	10.47	11.20	7.613	11.99	25- 30	40.65	1471	93.9.93.9
35	4.874	5.907	4.027	5.281	5.879	5.281	4.027	5.907	30- 35	21.34	1492	96.9.96.9
40	2.846	3.281	2.463	3.014	3.093	3.014	2.463	3.281	35- 40	12.71	1505	97.7.97.7
45	2.077	2.124	1.571	2.022	2.002	2.022	1.571	2.124	40- 45	8.717	1514	98.2.98.2
50	1.874	1.811	1.102	1.729	1.462	1.729	1.102	1.811	45- 50	6.896	1521	99.7.99.7
55	1.201	1.538	0.7959	1.439	1.184	1.439	0.7959	1.538	50- 55	4.182	1527	99.1.99.1
60	0.8226	1.124	0.6294	1.088	0.9312	1.088	0.6294	1.124	55- 60	3.050	1532	99.4.99.4
65	0.7808	0.7830	0.3708	0.6787	0.7428	0.6787	0.3708	0.7830	60- 65	2.889	1536	99.7.99.7
70	0.8368	0.4148	0.2139	0.3782	0.5189	0.3782	0.2139	0.4148	65- 70	2.532	1538	99.8.99.8
75	0.2228	0.1944	0.1037	0.1869	0.3481	0.1869	0.1037	0.1944	70- 75	1.489	1540	99.9.99.9
80	0.1012	0.0623	0.0280	0.0452	0.1290	0.0452	0.0280	0.0623	75- 80	0.6548	1540	100.100
85	0.0287	0	0	0.0009	0.0187	0.0009	0	0	80- 85	0.1245	1541	100.100
90	0	0	0	0	0	0	0	0	85- 90	0.0012	1541	100.100
95	0	0	0	0	0	0	0	0	90- 95	0	1541	100.100
100	0	0	0	0	0	0	0	0	95-100	0	1541	100.100
105	0	0	0	0	0	0	0	0	100-105	0	1541	100.100
110	0	0	0	0	0	0	0	0	105-110	0	1541	100.100
115	0	0	0	0	0	0	0	0	110-115	0	1541	100.100
120	0	0	0	0	0	0	0	0	115-120	0	1541	100.100
125	0	0	0	0	0	0	0	0	120-125	0	1541	100.100
130	0	0	0	0	0	0	0	0	125-130	0	1541	100.100
135	0	0	0	0	0	0	0	0	130-135	0	1541	100.100
140	0	0	0	0	0	0	0	0	135-140	0	1541	100.100
145	0	0	0	0	0	0	0	0	140-145	0	1541	100.100
150	0	0	0	0	0	0	0	0	145-150	0	1541	100.100
155	0	0	0	0	0	0	0	0	150-155	0	1541	100.100
160	0.0102	0.0174	0.0083	0.0053	0	0.0053	0.0083	0.0174	155-160	0.0034	1541	100.100
165	0.0382	0.0561	0.0548	0.0324	0.0008	0.0324	0.0548	0.0561	160-165	0.0287	1541	100.100
170	0.0584	0.0784	0.0929	0.0873	0.0100	0.0873	0.0929	0.0784	165-170	0.0679	1541	100.100
175	0.0872	0.0694	0.0699	0.0576	0.0143	0.0576	0.0699	0.0694	170-175	0.0492	1541	100.100
180	0.0393	0.0274	0.0287	0.0408	0.0401	0.0408	0.0287	0.0274	175-180	0.0132	1541	100.100



**LUMINANCE cd/(m2)**

G (DEG)	C0/180	C90/270
85	11	0
80	53	20
75	125	40
70	157	62
65	178	88
60	185	126
55	209	129
50	243	171
45	294	222

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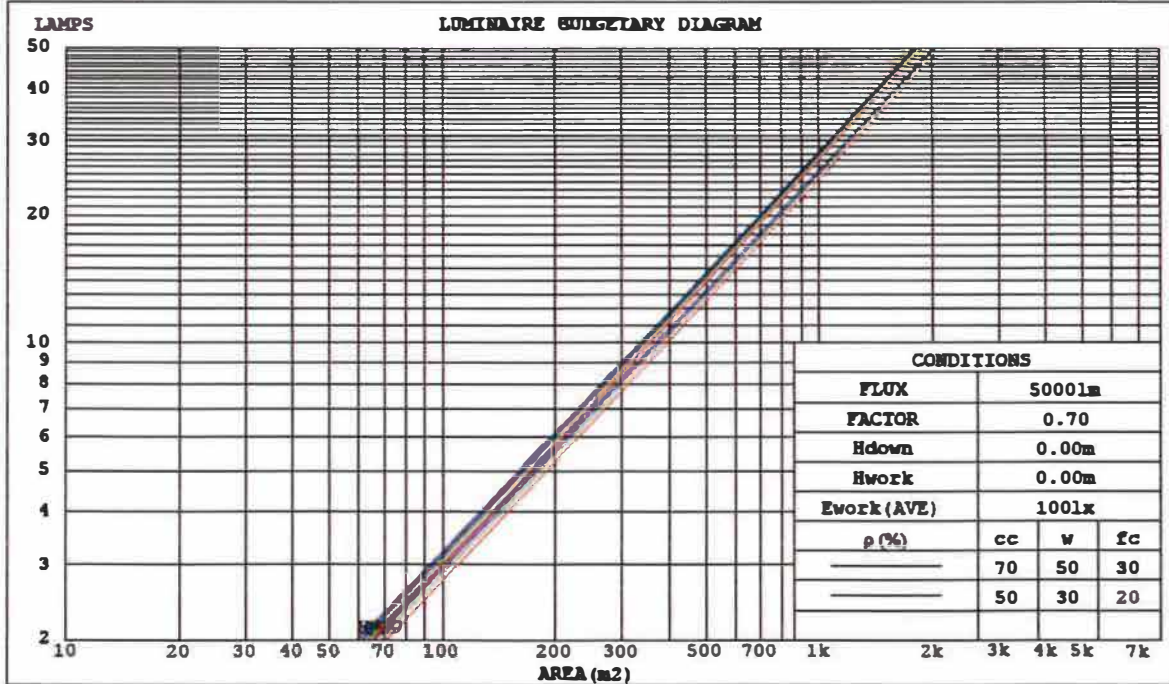
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**2.1 RGBA Fotometrik Deney Sonuçları (Photometric Test Results of the RGBA )**

**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	0															
ffc	0															
BCR	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	1.14	1.12	1.10	1.11	1.10	1.08	1.07	1.06	1.05	1.04	1.03	1.02	1.00	.00	.99	.98
2.0	1.09	1.06	1.04	1.07	1.05	1.03	1.04	1.02	1.01	1.01	.00	.99	.99	.98	.97	.96
3.0	1.05	1.02	.99	1.04	1.01	.99	1.01	.99	.97	.99	.97	.96	.97	.95	.94	.93
4.0	1.02	.98	.96	1.01	.98	.96	.99	.96	.94	.97	.95	.93	.96	.94	.92	.91
5.0	.99	.95	.93	.98	.95	.92	.96	.94	.92	.95	.93	.91	.94	.92	.90	.89
6.0	.96	.93	.90	.96	.92	.90	.94	.91	.89	.93	.91	.89	.92	.90	.88	.87
7.0	.94	.90	.88	.94	.90	.88	.92	.90	.87	.91	.89	.87	.91	.88	.87	.86
8.0	.92	.89	.86	.92	.88	.86	.91	.88	.86	.90	.87	.85	.89	.87	.85	.84
9.0	.90	.87	.84	.90	.87	.84	.89	.86	.84	.88	.86	.84	.88	.85	.84	.83
10.0	.88	.85	.83	.88	.85	.83	.88	.85	.83	.87	.84	.82	.86	.84	.82	.82



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**2.1 RGBA Fotometrik Deneş Sonuları (Photometric Test Results of the RGBA)**

**WEC AND CCEC**

pcc	80%			70%			50%			30%			10%			0
p <sub>v</sub>	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
p <sub>fc</sub>	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients (WEC)									
0.0																
1.0	.125	.071	.022	.118	.067	.021	.106	.061	.019	.094	.054	.017	.084	.049	.016	
2.0	.114	.063	.019	.109	.060	.018	.099	.055	.017	.089	.050	.016	.081	.046	.014	
3.0	.105	.056	.017	.101	.054	.016	.093	.050	.015	.085	.046	.014	.078	.043	.013	
4.0	.098	.051	.015	.094	.049	.015	.087	.046	.014	.080	.043	.013	.074	.040	.012	
5.0	.091	.046	.013	.088	.045	.013	.082	.043	.013	.076	.040	.012	.071	.038	.011	
6.0	.085	.043	.012	.083	.042	.012	.078	.040	.012	.073	.038	.011	.068	.036	.011	
7.0	.080	.040	.011	.078	.039	.011	.074	.037	.011	.070	.036	.010	.066	.034	.010	
8.0	.076	.037	.010	.074	.036	.010	.070	.035	.010	.067	.034	.010	.063	.032	.009	
9.0	.072	.035	.010	.070	.034	.010	.067	.033	.009	.064	.032	.009	.061	.031	.009	
10.0	.069	.033	.009	.067	.032	.009	.064	.031	.009	.061	.030	.009	.059	.030	.008	

pcc	80%			70%			50%			30%			10%			0
p <sub>v</sub>	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
p <sub>fc</sub>	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients (CCEC)									
0.0	.191	.191	.191	.163	.163	.163	.111	.111	.111	.064	.064	.064	.020	.020	.020	
1.0	.168	.158	.149	.143	.135	.128	.098	.093	.089	.056	.054	.052	.018	.017	.017	
2.0	.149	.133	.120	.127	.114	.103	.087	.079	.072	.050	.046	.042	.016	.015	.014	
3.0	.133	.113	.098	.114	.098	.085	.078	.068	.059	.045	.040	.035	.015	.013	.011	
4.0	.120	.098	.081	.103	.084	.070	.071	.059	.050	.041	.034	.029	.013	.011	.010	
5.0	.108	.085	.068	.093	.074	.059	.064	.051	.042	.037	.030	.025	.012	.010	.008	
6.0	.099	.075	.058	.085	.065	.050	.059	.045	.036	.034	.027	.021	.011	.009	.007	
7.0	.091	.066	.049	.078	.058	.043	.054	.040	.031	.031	.024	.018	.010	.008	.006	
8.0	.084	.059	.043	.072	.052	.037	.050	.036	.026	.029	.021	.016	.009	.007	.005	
9.0	.078	.054	.037	.067	.047	.033	.046	.033	.023	.027	.019	.014	.009	.006	.005	
10.0	.073	.049	.033	.063	.042	.029	.043	.030	.020	.025	.018	.012	.008	.006	.004	



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**2.1 RGBa Fotometrik Deney Sonuçları (Photometric Test Results of the RGBa)**

**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	-1.3	-0.7	-1.1	-0.6	-0.4	-3.2	-2.6	-3.0	-2.5	-2.4
3H	-0.7	-0.1	-0.4	0.0	0.2	-3.0	-2.5	-2.7	-2.3	-2.1
4H	-0.5	0.0	-0.3	0.2	0.4	-3.0	-2.5	-2.7	-2.3	-2.1
6H	-0.5	-0.0	-0.2	0.2	0.5	-3.0	-2.6	-2.8	-2.3	-2.1
8H	-0.5	-0.1	-0.2	0.2	0.4	-3.1	-2.6	-2.8	-2.4	-2.1
12H	-0.6	-0.1	-0.3	0.1	0.4	-3.1	-2.7	-2.8	-2.4	-2.2
4H 2H	-0.9	-0.4	-0.7	-0.2	-0.0	-2.5	-2.0	-2.3	-1.8	-1.6
3H	-0.3	0.2	0.0	0.4	0.7	-2.3	-1.8	-2.0	-1.5	-1.3
4H	-0.1	0.3	0.2	0.6	0.9	-2.2	-1.8	-1.9	-1.5	-1.3
6H	-0.1	0.3	0.3	0.6	0.9	-2.3	-1.9	-1.9	-1.6	-1.3
8H	-0.1	0.2	0.2	0.5	0.9	-2.4	-2.0	-2.0	-1.7	-1.3
12H	-0.2	0.1	0.2	0.5	0.9	-2.4	-2.1	-2.0	-1.7	-1.4
8H 4H	-0.2	0.2	0.2	0.5	0.9	-2.2	-1.9	-1.9	-1.5	-1.2
6H	-0.2	0.1	0.2	0.5	0.9	-2.3	-2.0	-1.9	-1.6	-1.2
8H	-0.2	0.0	0.2	0.4	0.9	-2.4	-2.1	-1.9	-1.7	-1.3
12H	-0.3	-0.1	0.2	0.4	0.8	-2.4	-2.2	-2.0	-1.8	-1.3
12H 4H	-0.2	0.1	0.2	0.4	0.8	-2.3	-2.0	-1.9	-1.6	-1.2
6H	-0.2	0.0	0.2	0.4	0.9	-2.4	-2.1	-1.9	-1.7	-1.2
8H	-0.3	-0.1	0.2	0.4	0.8	-2.4	-2.2	-1.9	-1.8	-1.3
<b>Variations with the observer position at spacings:</b>										
S = 1.0H	+ 0.5 / - 0.7					+ 0.9 / - 1.1				
1.5H	+ 0.7 / - 0.8					+ 0.8 / - 1.0				
2.0H	+ 0.7 / - 1.5					+ 1.1 / - 1.9				

CIE Pub.117 Corrected 1541 lm Total Lamp Luminous Flux. (8log(F/F0) = 1.5)



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**2.1 RGBA Fotometrik Deney Sonuçları (Photometric Test Results of the RGBA)****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	0.6	0.3	0.7	0.6	0.3	0.7	0.6	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) $k(RI) \times RCR = 5$									
$k = 0.60$	90	84	81	90	84	81	89	84	81	77
0.80	97	92	88	97	91	88	95	91	88	85
1.00	101	96	93	100	95	92	99	95	92	88
1.25	105	100	97	104	99	96	102	98	96	92
1.50	107	103	100	106	102	99	104	101	98	94
2.00	109	106	103	108	105	102	106	103	100	95
2.50	111	107	105	109	106	104	106	104	102	96
3.00	112	109	107	111	108	106	107	106	103	97
4.00	114	112	110	112	110	108	109	107	106	99
5.00	116	113	112	113	112	110	110	108	107	100
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004			Suspended				RCR = 1.25			



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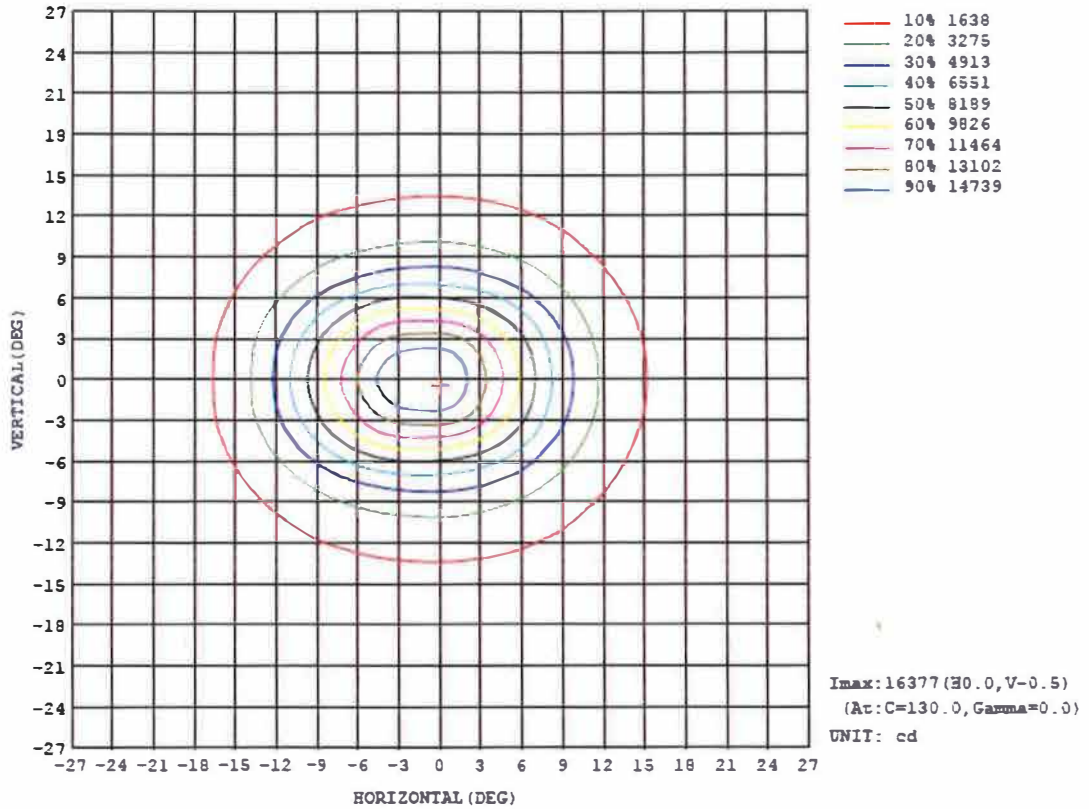
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**2.1 RGBa Fotometrik Deney Sonuçları (Photometric Test Results of the RGBa )**

**ISOCANDELA DIAGRAM**



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

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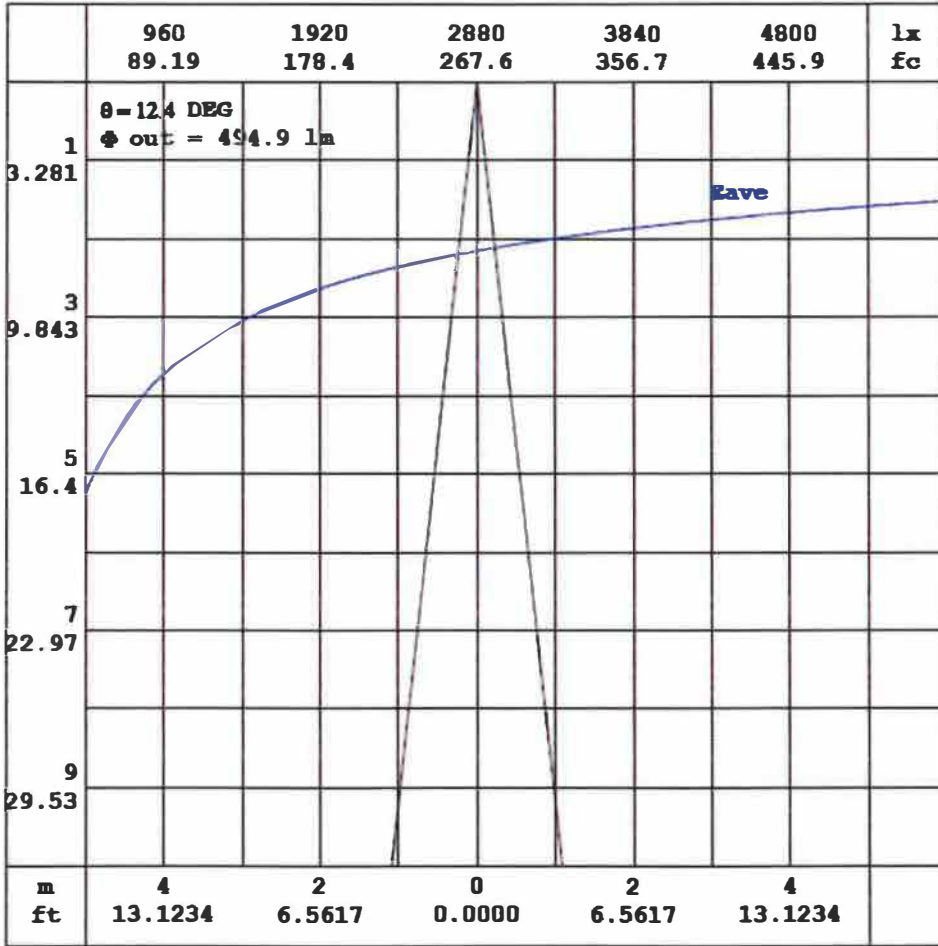
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**2.1 RGBA Fotometrik Deney Sonuçları (Photometric Test Results of the RGBA)****AAI CURVES**

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



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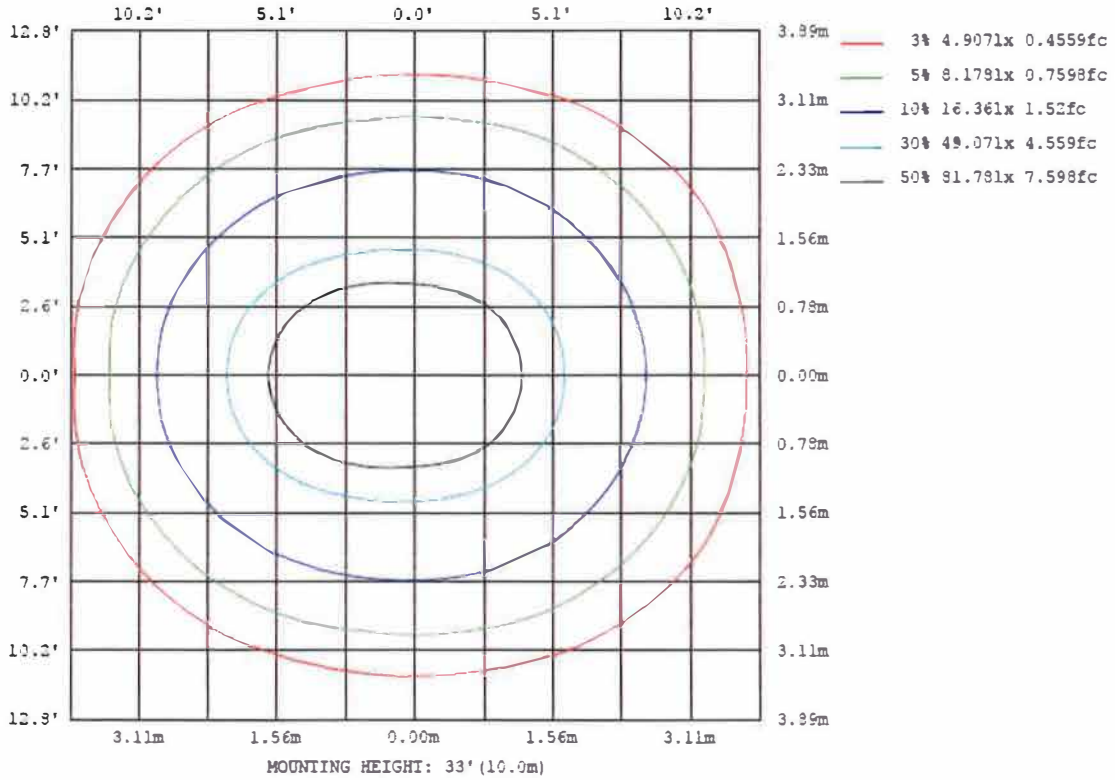
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**2.1 RGBA Fotometrik Deney Sonuçları (Photometric Test Results of the RGBA)**

**ISOLUX DIAGRAM**



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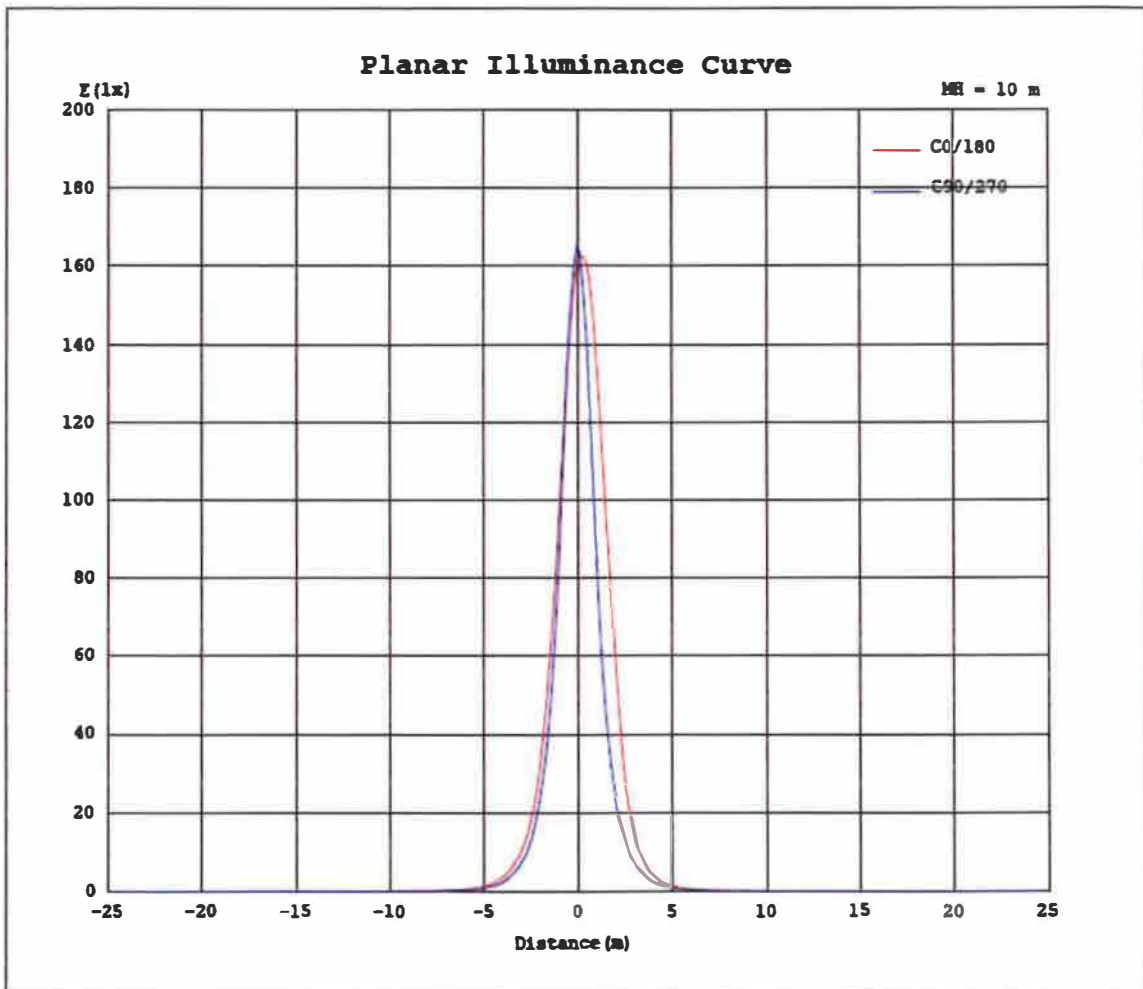
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**2.1 RGBA Fotometrik Deney Sonuçları (Photometric Test Results of the RGBA)**



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**2.2 RGBA Spektrokolorimetrik Deney Sonuçları (spectrocolorimetric Test Results of the RGBA)****Elektriksel Ölçümler**

(Electrical Measurements)

<b>Ölçülen Güç (W)</b> (Input Power)	47,20 W
<b>Ölçülen Gerilim (V)</b> (Input Voltage)	46,76 VDC
<b>Ölçülen Akım (A)</b> (Input Current)	1,01 A
<b>Güç Faktörü (PF)</b> (Power Factor)	-
<b>Ölçülen Frekans (Hz)</b> (Input Frequency)	-
<b>Ortam Sıcaklığı / Bağıl Nem</b> (Ambient Temperature / Relative Humidity)	25.1 °C 46% Rh
<b>Stabilizasyon Süresi</b> (Stabilization Time)	60 dk ±5dk

**Spektrokolorimetrik Ölçüm Sonuçları**

(Spectrocolorimetric Measurement Results)

<b>Chrom x</b>	0,3116
<b>Chrom y</b>	0,3273
<b>Duv</b>	0,0028
<b>Chrom u'</b>	0,1977
<b>Chrom v'</b>	0,4672
<b>Peak</b>	444 nm
<b>Dominant</b>	488 nm
<b>CCT</b>	6579 K
<b>Nominal CCT</b>	-
<b>Ra(CRI)</b>	71
<b>R9</b>	-25
<b>S/P Ratio</b>	2,0
<b>Preburning time</b>	1 hr
<b>Test Configuration</b>	4π



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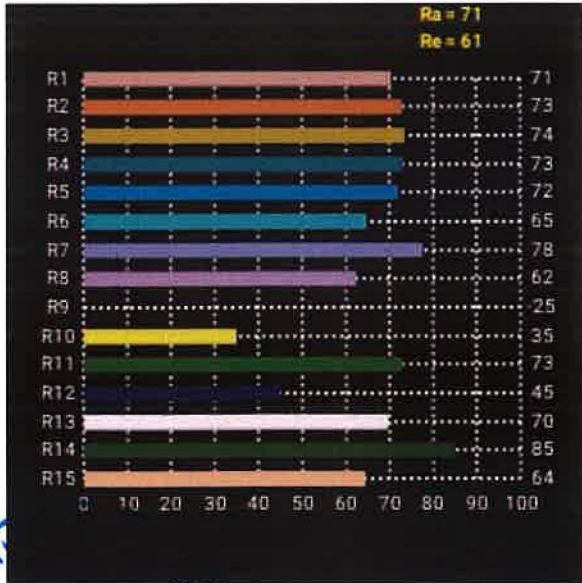
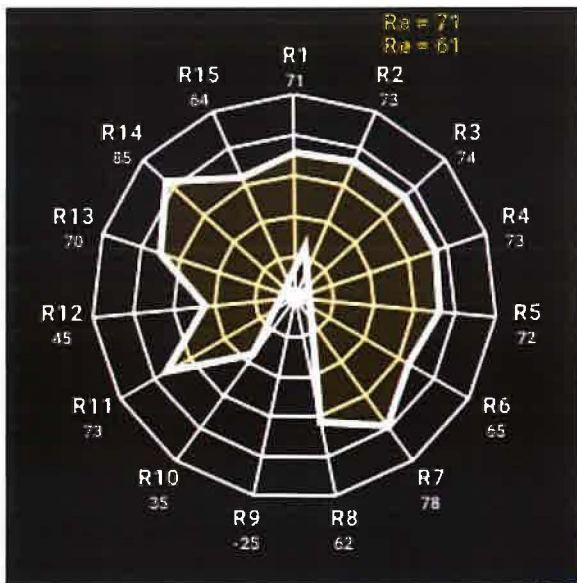
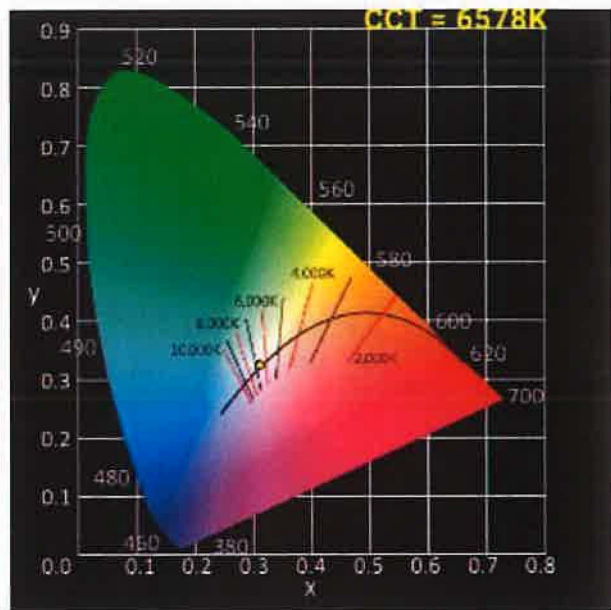
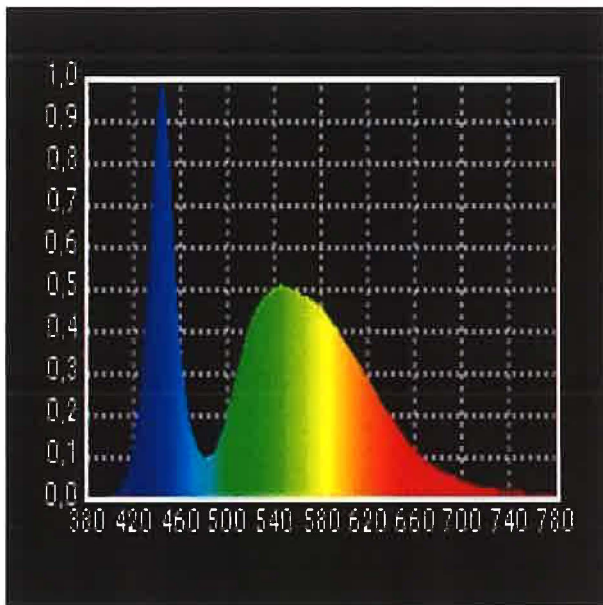
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**2.2 RGBa Spektrokolorimetrik Deney Sonuçları (spectrocolorimetric Test Results of the RGBa)**

**Spectral Power Distribution**



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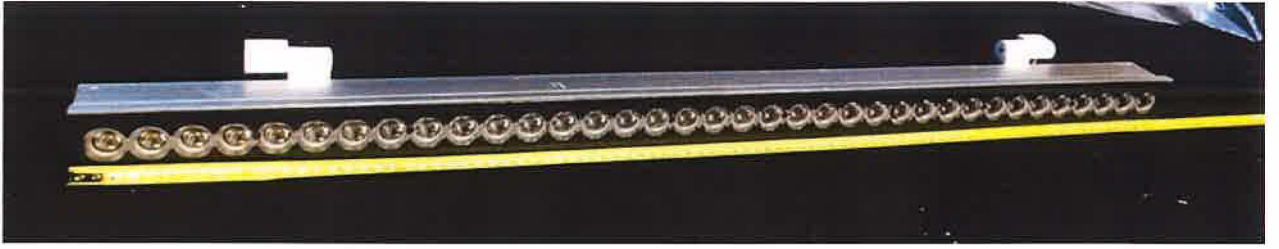
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**3.1 DGC'nin Fotoğrafları (Photos of EUT)**



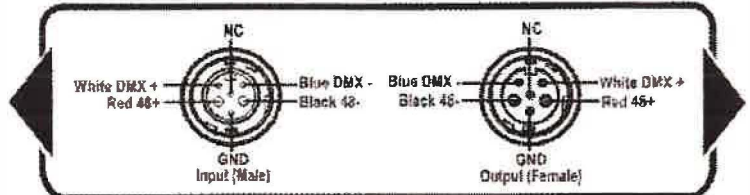
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entertainment & architecture lighting

CE FC III

RoHS compliant IP67



P02022101 Leoline®S12 915mm DMX RGBA Linear Spot Beam  
14' 48V DC / Max. 1.03A / Max. 49.4W  
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