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**ÖLÇÜM RAPORU**  
MEASUREMENT REPORT

TL-806
19-TST-0095-192
08-19

**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-0095

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

: Leoline® S12 915mm DMX SC NW 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

: 02.08.2019

**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.  
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Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ( olması halinde ) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.  
The test and/or measurement results, the uncertainties ( if applicable ) with confidence probability and test methods are given on the following pages which are part of this report.

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



**Deney Sorumlusu**  
Person in charge of test

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 SC NW  
Linear Spot Beam 14°

**Seri Numarası / Serial Number**

: Test Numunesi  
Test Sample

**Beyan Gücü / Rated Power**

: 44,6 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 (Components)	Üretici (Manufacturer)	Model (Model)	Teknik Bilgi (Technical Data)	Standart no. (Standart No.)
LED	Cree Inc	XTEAWT 4000K White Led	Binned at 85 °C • Thermal resistance: 5 °C/W • Wide viewing angle: 115°-140° Unlimited floor life at ≤ 30 °C/85% Maximum drive current: White 1.5 A, Royal Blue 1.5 A Maximum Vf for High Efficacy XT-E White: 2.85 V	UL (E349212) RoHS REACH
PCB	PCB	C13088_R1.1	0.8mm FR4 4 Layers 35+35+35+35umCu/ BlackSolderMask/WhiteSilkScreen	IPC A 600 J Class II Revizyon J standardı (COC) IPC 6012 Class II UL FCC
LENS	LEDIL	CA11016_TINA2-RS-14	Dimensions Ø 16.1 mm Height 9.7 mm	ANSI/ESD S20.20:2014 EN 61340-5-1:2007

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

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**2.1 NW Fotometrik Deney Sonuçları (Photometric Test Results of the NW)****Elektriksel Ölçümler**

(Electrical Measurements)

<b>Ölçülen Güç (W)</b> (Input Power)	43,60 W
<b>Ölçülen Gerilim (V)</b> (Input Voltage)	46,90 VDC
<b>Ölçülen Akım (A)</b> (Input Current)	0,93 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 48% 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)	3053,9
<b>Maksimum Işık Şiddeti</b> (Max. Light Intensity) (cd)	23396
<b>Armatür Etkinliği</b> (Luminaire Efficacy) (lm/W)	70,04





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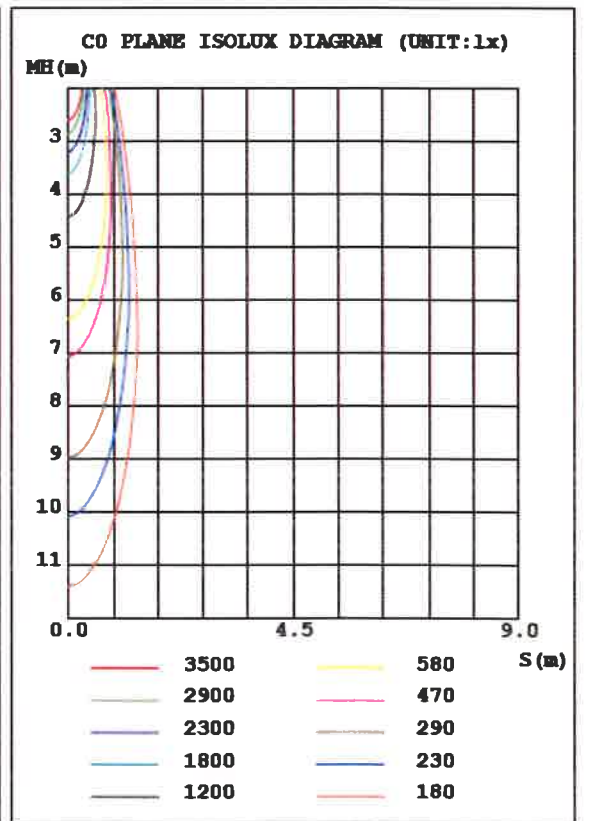
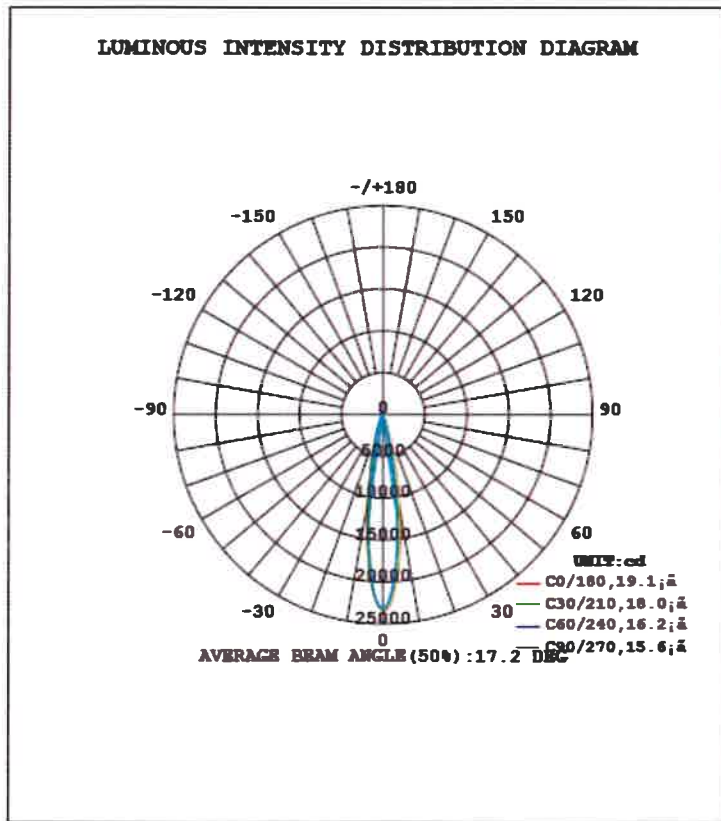
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**2.1 NW Fotometrik Deney Sonuçları (Photometric Test Results of the NW)**



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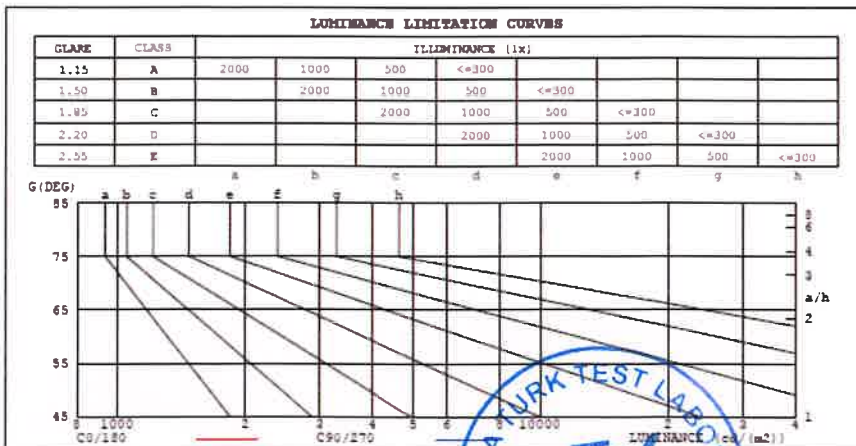
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**2.1 NW Fotometrik Deney Sonuçları (Photometric Test Results of the NW)**

**ZONAL FLUX DIAGRAM  
AND LUMINANCE LIMITATION CURVES**

**ZONAL FLUX DIAGRAM:**

y	C0	C45	C90	C135	C180	C225	C270	C315	y	☉ some	☉ total	lum.lamp
5	1886	1802	1710	1622	1540	1461	1373	1288	0- 5	491.3	491.3	16.1,16.1
10	1079	902.7	782.9	694.2	611.9	532.6	479.0	441.1	5- 10	940.2	1432	46.9,46.9
15	477.6	378.2	291.6	231.2	185.9	141.9	103.8	77.7	10- 15	703.2	2127	70.70
20	202.9	172.1	119.7	144.8	170.6	182.3	126.4	177.3	15- 20	406.0	2342	82.2,82.2
25	89.91	82.31	47.61	61.92	64.78	67.88	50.22	61.75	20- 25	222.3	2766	90.6,90.6
30	34.76	36.61	20.17	26.86	27.53	20.32	21.06	24.21	25- 30	114.9	2881	94.2,94.2
35	15.55	16.54	10.26	12.33	12.06	14.29	9.039	16.78	30- 35	59.17	2940	96.2,96.2
40	8.181	8.761	5.932	6.663	6.708	7.418	5.481	8.287	35- 40	22.85	2972	97.4,97.4
45	5.091	5.230	3.626	4.428	4.499	4.492	3.211	4.988	40- 45	20.66	2994	98.98
50	2.772	4.252	2.618	2.824	2.609	3.823	2.979	2.961	45- 50	15.72	2009	98.5,98.5
55	2.892	2.221	1.984	2.824	2.591	2.827	1.728	2.302	50- 55	12.48	2012	99.99
60	2.262	2.284	1.369	2.215	2.127	2.178	1.222	2.224	55- 60	11.28	2034	99.4,99.4
65	1.795	1.775	0.8948	1.520	1.717	1.405	0.7876	1.606	60- 65	8.655	2042	99.6,99.6
70	1.262	0.9594	0.5221	0.8247	1.164	0.7710	0.4188	0.8608	65- 70	5.715	2045	99.8,99.8
75	0.6970	0.4485	0.2423	0.3918	0.6949	0.3882	0.2123	0.4148	70- 75	3.144	2052	99.9,99.9
80	0.2606	0.1727	0.1060	0.1611	0.2776	0.1819	0.0917	0.1623	75- 80	1.502	2052	100,100
85	0.0247	0.0195	0.0112	0.0201	0.0468	0.0160	0.0090	0.0196	80- 85	0.4425	2054	100,100
90	0	0	0	0	0	0	0	0	85- 90	0.0160	2054	100,100
95	0	0	0	0	0	0	0	0	90- 95	0	2054	100,100
100	0	0	0	0	0	0	0	0	95-100	0	2054	100,100
105	0	0	0	0	0	0	0	0	100-105	0	2054	100,100
110	0	0	0	0	0	0	0	0	105-110	0	2054	100,100
115	0	0	0	0	0	0	0	0	110-115	0	2054	100,100
120	0	0	0	0	0	0	0	0	115-120	0	2054	100,100
125	0	0	0	0	0	0	0	0	120-125	0	2054	100,100
130	0	0	0	0	0	0	0	0	125-130	0	2054	100,100
135	0	0	0	0	0	0	0	0	130-135	0	2054	100,100
140	0	0	0	0	0	0	0	0	135-140	0	2054	100,100
145	0	0	0	0	0	0	0	0	140-145	0	2054	100,100
150	0	0	0	0	0	0	0	0	145-150	0	2054	100,100
155	0	0.0077	0.0055	0.0064	0	0.0000	0	0	150-155	0.0028	2054	100,100
160	0.0370	0.0475	0.0458	0.0284	0.0109	0.0120	0.0047	0.0042	155-160	0.0229	2054	100,100
165	0.0777	0.0985	0.1094	0.0774	0.0271	0.0255	0.0239	0.0198	160-165	0.0644	2054	100,100
170	0.1096	0.1323	0.1514	0.1107	0.0425	0.0382	0.0370	0.0264	165-170	0.0826	2054	100,100
175	0.1139	0.1304	0.1282	0.1115	0.0518	0.0462	0.0423	0.0402	170-175	0.0600	2054	100,100
180	0.0974	0.0946	0.0852	0.0815	0.0922	0.0979	0.0782	0.0841	175-180	0.0285	2054	100,100



**LUMINANCE cd/(m2)**

G (DEG)	C0/180	C90/270
85	42	12
80	150	61
75	269	94
70	369	152
65	425	212
60	472	274
55	502	346
50	587	407
45	720	514

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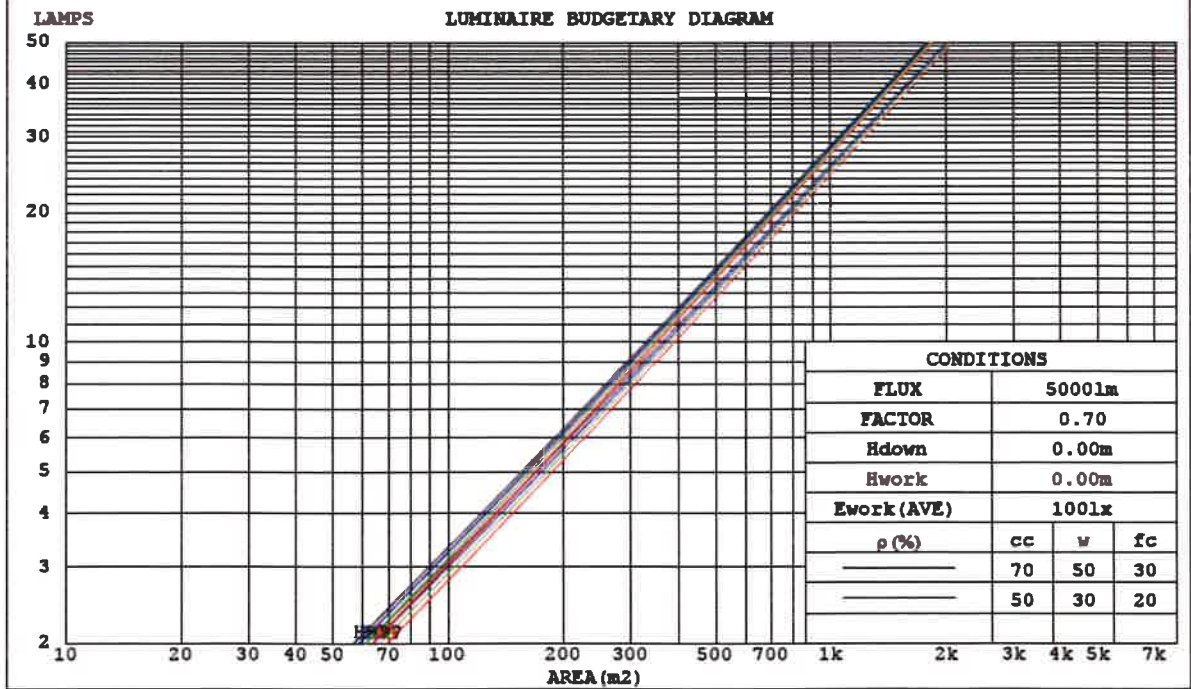
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**2.1 NW Fotometrik Deney Sonuçları (Photometric Test Results of the NW )**

**CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM**

$\rho_{cc}$	80%			70%			50%			30%			10%			0
$\rho_w$	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
$\rho_{fc}$	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Coefficients of Utilization (CU)									
0.0	1.19	1.19	1.19	1.16	1.16	1.16	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	.00
1.0	1.13	1.11	1.10	1.11	1.09	1.08	1.07	1.06	1.05	1.03	1.02	1.02	1.00	.99	.99	.97
2.0	1.08	1.06	1.03	1.07	1.04	1.02	1.03	1.01	.00	1.01	.99	.98	.98	.97	.96	.94
3.0	1.04	1.00	.98	1.03	.00	.97	1.00	.98	.96	.98	.96	.94	.96	.94	.93	.91
4.0	1.00	.97	.94	.99	.96	.93	.97	.94	.92	.95	.93	.91	.94	.92	.90	.89
5.0	.97	.93	.90	.96	.93	.90	.95	.92	.89	.93	.91	.88	.92	.90	.88	.87
6.0	.94	.90	.87	.93	.90	.87	.92	.89	.87	.91	.88	.86	.90	.87	.86	.85
7.0	.92	.88	.85	.91	.87	.85	.90	.87	.84	.89	.86	.84	.88	.85	.84	.83
8.0	.89	.85	.83	.89	.86	.83	.88	.85	.82	.87	.84	.82	.86	.84	.82	.81
9.0	.87	.83	.81	.87	.83	.81	.86	.83	.80	.85	.82	.80	.84	.82	.80	.79
10.0	.85	.81	.79	.85	.81	.79	.84	.81	.79	.83	.81	.79	.83	.80	.78	.78





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### 2.1 NW Fotometrik Deney Sonuçları (Photometric Test Results of the NW )

#### WEC AND CCEC

$\rho_{cc}$	80%			70%			50%			30%			10%			0
$\rho_w$	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
$\rho_{fc}$	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients (WEC)									
0.0																
1.0	.132	.075	.024	.125	.071	.023	.113	.065	.021	.101	.058	.019	.091	.053	.017	
2.0	.121	.067	.020	.116	.064	.020	.106	.059	.018	.097	.054	.017	.088	.050	.016	
3.0	.113	.060	.018	.108	.058	.017	.100	.054	.016	.092	.050	.015	.085	.047	.014	
4.0	.105	.054	.016	.101	.053	.016	.094	.050	.015	.087	.047	.014	.081	.044	.013	
5.0	.098	.050	.014	.095	.049	.014	.089	.046	.014	.083	.044	.013	.078	.042	.013	
6.0	.092	.046	.013	.090	.045	.013	.084	.043	.013	.080	.041	.012	.075	.040	.012	
7.0	.087	.043	.012	.085	.042	.012	.080	.041	.012	.076	.039	.011	.072	.038	.011	
8.0	.083	.040	.011	.081	.040	.011	.077	.038	.011	.073	.037	.011	.070	.036	.010	
9.0	.079	.038	.011	.077	.038	.011	.074	.036	.010	.070	.035	.010	.067	.034	.010	
10.0	.075	.036	.010	.074	.036	.010	.071	.035	.010	.068	.034	.010	.065	.033	.009	

$\rho_{cc}$	80%			70%			50%			30%			10%			0
$\rho_w$	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
$\rho_{fc}$	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	.144	.135	.128	.098	.093	.088	.057	.054	.051	.018	.017	.017	
2.0	.150	.133	.119	.128	.114	.103	.088	.079	.072	.051	.046	.042	.016	.015	.014	
3.0	.134	.113	.097	.115	.098	.084	.079	.068	.059	.046	.040	.035	.015	.013	.011	
4.0	.121	.098	.080	.104	.085	.069	.072	.059	.049	.041	.035	.029	.013	.011	.010	
5.0	.110	.085	.067	.095	.074	.058	.065	.052	.041	.038	.030	.024	.012	.010	.008	
6.0	.101	.075	.057	.087	.065	.049	.060	.046	.035	.035	.027	.021	.011	.009	.007	
7.0	.093	.067	.048	.080	.058	.042	.055	.041	.030	.032	.024	.018	.010	.008	.006	
8.0	.087	.060	.042	.075	.052	.037	.052	.037	.026	.030	.022	.015	.010	.007	.005	
9.0	.081	.054	.037	.070	.047	.032	.048	.033	.023	.028	.020	.013	.009	.006	.004	
10.0	.076	.049	.032	.065	.043	.028	.045	.030	.020	.026	.018	.012	.009	.006	.004	



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

**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	3.1	3.7	3.3	3.9	4.0	0.5	1.1	0.7	1.3	1.4
3H	3.6	4.2	3.9	4.4	4.6	0.7	1.3	1.0	1.5	1.7
4H	3.7	4.3	4.0	4.5	4.7	0.7	1.3	1.0	1.5	1.7
6H	3.7	4.3	4.0	4.5	4.7	0.7	1.2	1.0	1.4	1.7
8H	3.7	4.2	4.0	4.4	4.7	0.6	1.1	0.9	1.4	1.6
12H	3.7	4.1	4.0	4.4	4.7	0.6	1.1	0.9	1.3	1.6
4H 2H	3.3	3.8	3.6	4.0	4.3	1.1	1.6	1.3	1.8	2.0
3H	3.9	4.4	4.2	4.6	4.9	1.4	1.9	1.7	2.1	2.4
4H	4.0	4.4	4.3	4.7	5.0	1.4	1.8	1.7	2.1	2.4
6H	4.0	4.4	4.4	4.7	5.1	1.3	1.7	1.7	2.1	2.4
8H	4.0	4.3	4.4	4.7	5.1	1.3	1.7	1.7	2.0	2.4
12H	3.9	4.3	4.3	4.6	5.0	1.2	1.6	1.6	1.9	2.3
8H 4H	3.9	4.3	4.3	4.6	5.0	1.4	1.8	1.8	2.1	2.5
6H	3.9	4.2	4.3	4.6	5.0	1.4	1.7	1.8	2.0	2.5
8H	3.9	4.2	4.3	4.6	5.0	1.3	1.6	1.7	2.0	2.4
12H	3.8	4.1	4.3	4.5	5.0	1.2	1.5	1.7	1.9	2.4
12H 4H	3.9	4.2	4.3	4.6	4.9	1.3	1.7	1.7	2.1	2.4
6H	3.9	4.1	4.3	4.6	5.0	1.3	1.6	1.7	2.0	2.4
8H	3.8	4.1	4.3	4.5	5.0	1.3	1.5	1.7	1.9	2.4
Variations with the observer position at spacings:										
S = 1.0H	+ 0.8 / - 1.1					+ 1.0 / - 1.5				
1.5H	+ 1.5 / - 1.1					+ 1.2 / - 1.2				
2.0H	+ 0.8 / - 1.1					+ 1.0 / - 2.0				

CIE Pub.117 Corrected 3054 lm Total Lamp Luminous Flux. (8log(F/F0) = 3.9)



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**2.1 NW Fotometrik Deney Sonuçları (Photometric Test Results of the NW)****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) $k(RI) \times RCR = 5$									
$k = 0.60$	90	84	81	89	84	80	89	84	80	77
0.80	97	92	88	96	91	88	96	91	88	84
1.00	101	96	92	100	95	92	99	95	92	88
1.25	106	100	97	104	99	96	102	98	95	91
1.50	107	103	100	106	102	99	104	100	98	94
2.00	109	106	103	108	104	102	106	103	100	96
2.50	111	107	105	109	106	104	106	104	102	96
3.00	112	109	107	111	108	106	107	105	103	97
4.00	114	112	110	112	110	108	109	107	106	99
5.00	116	113	112	113	112	110	109	108	107	100
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004										
Suspended										
SERNOX = 1.25										



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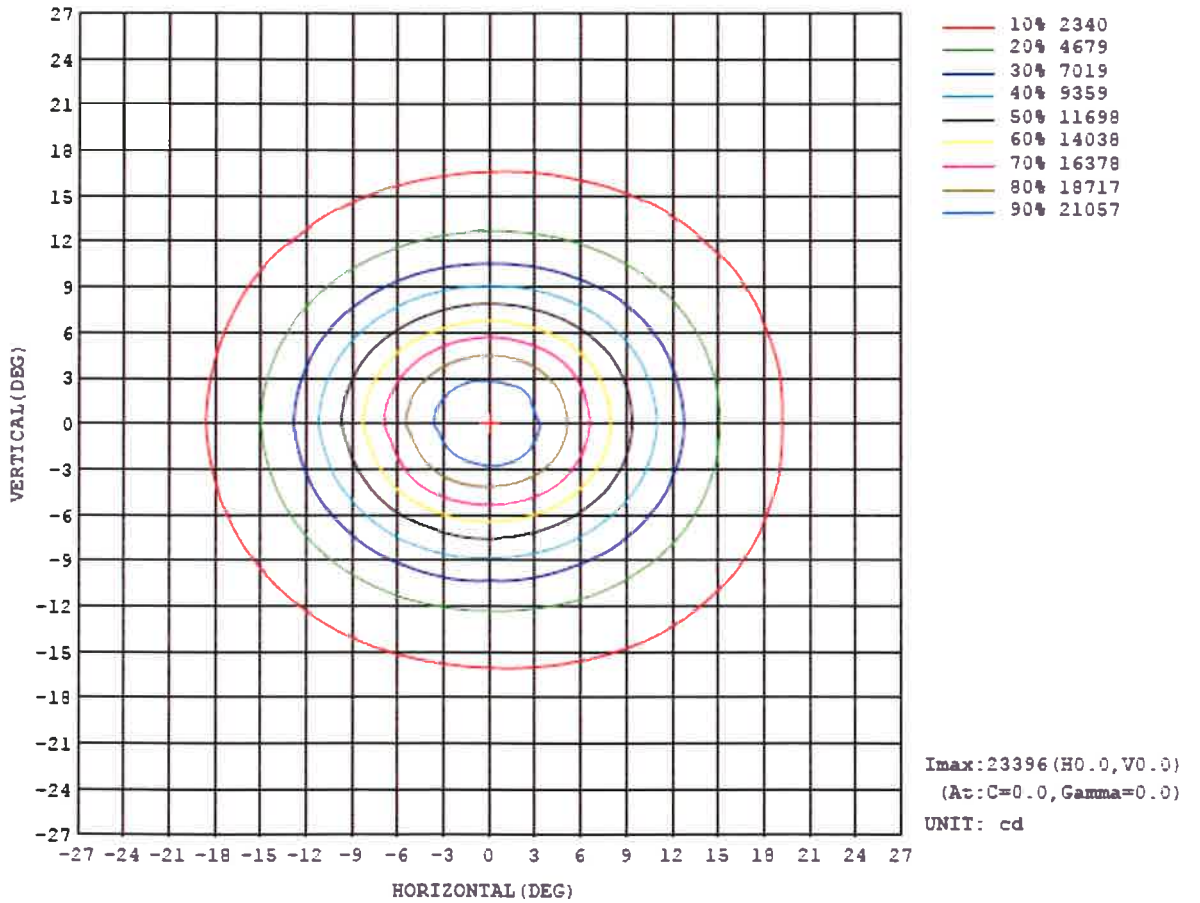
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**2.1 NW Fotometrik Deney Sonuçları (Photometric Test Results of the NW )**

**ISOCANDELA DIAGRAM**





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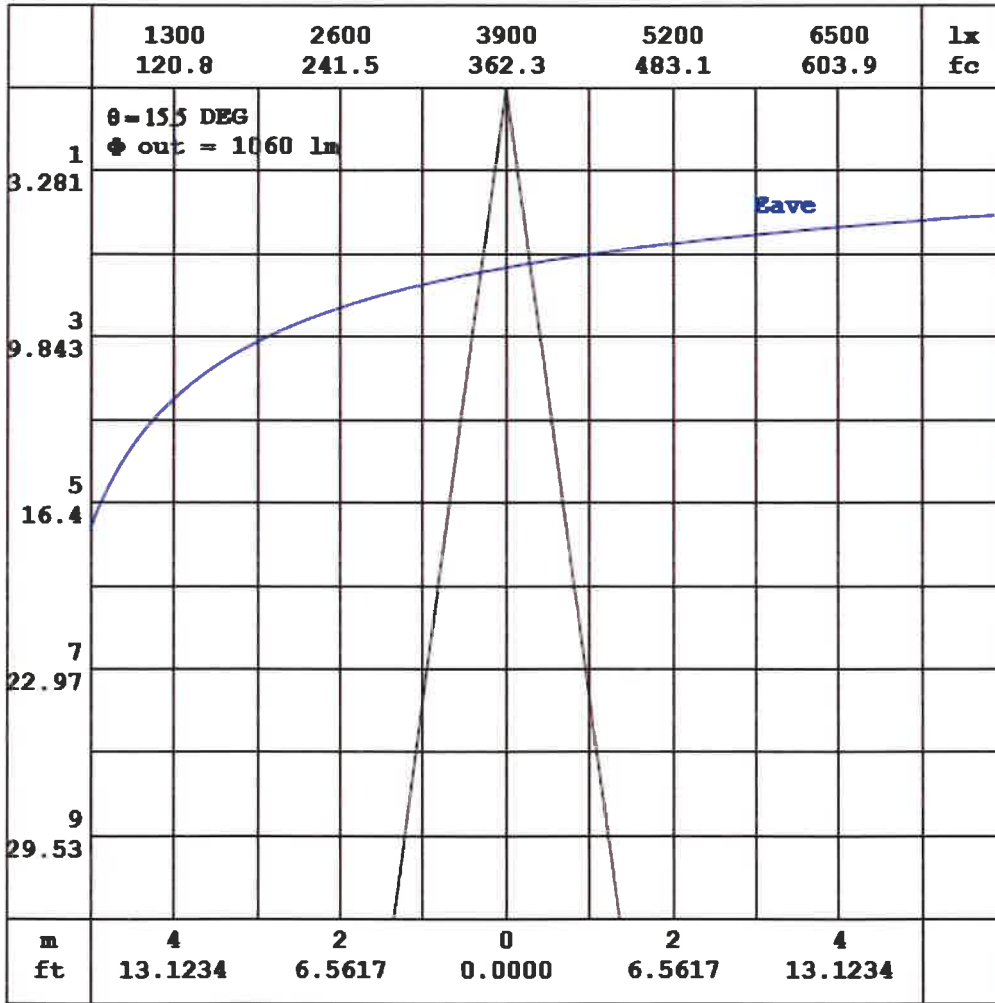
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**2.1 NW Fotometrik Deney Sonuçları (Photometric Test Results of the NW)****AAI CURVES**

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



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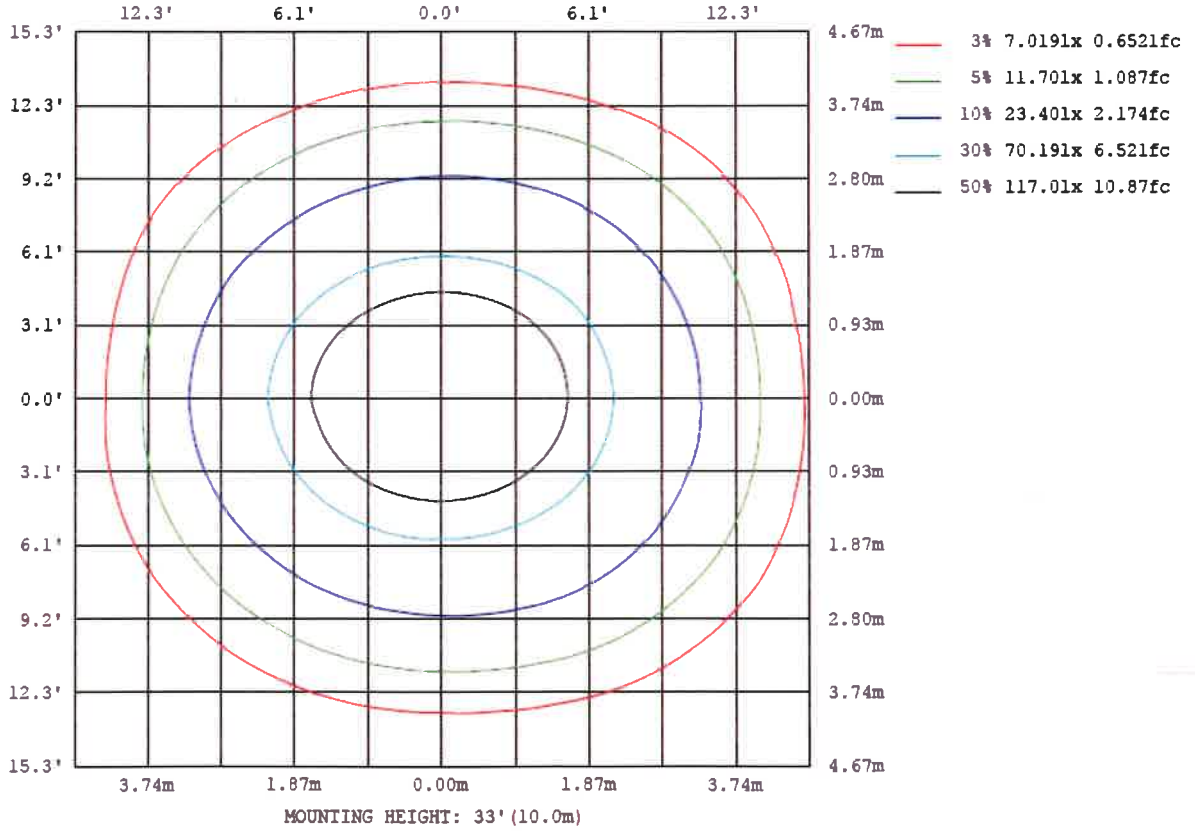
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**2.1 NW Fotometrik Deney Sonuçları (Photometric Test Results of the NW)**

**ISOLUX DIAGRAM**



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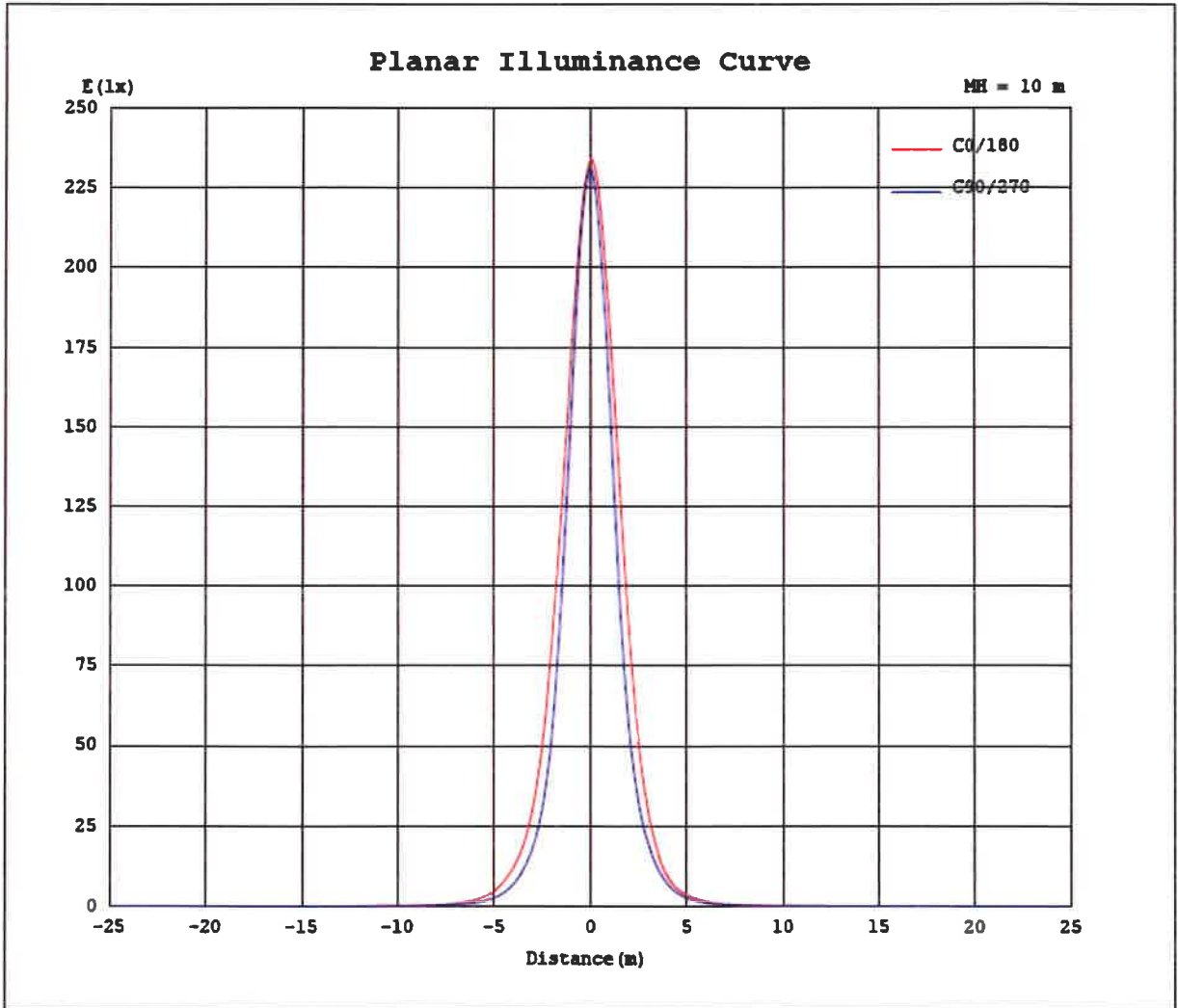
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**2.1 NW Fotometrik Deney Sonuçları (Photometric Test Results of the NW)**



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

(Electrical Measurements)

<b>Ölçülen Güç (W)</b> (Input Power)	43,60 W
<b>Ölçülen Gerilim (V)</b> (Input Voltage)	46,90 VDC
<b>Ölçülen Akım (A)</b> (Input Current)	0,93 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 °C 48% Rh
<b>Stabilizasyon Süresi</b> (Stabilization Time)	60 dk ±5dk

**Spektrokolorimetrik Ölçüm Sonuçları**

(Spectrocolorimetric Measurement Results)

<b>Chrom x</b>	0,3839
<b>Chrom y</b>	0,3864
<b>Duv</b>	0,0034
<b>Chrom u'</b>	0,2236
<b>Chrom v'</b>	0,5063
<b>Peak</b>	585 nm
<b>Dominant</b>	577 nm
<b>CCT</b>	3978 K
<b>Nominal CCT</b>	-
<b>Ra(CRI)</b>	71
<b>R9</b>	-29
<b>S/P Ratio</b>	1,5
<b>Preburning time</b>	1 hr
<b>Test Configuration</b>	4π





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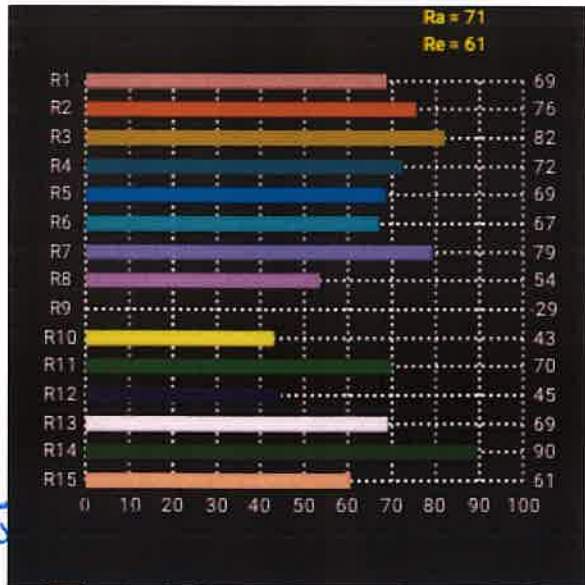
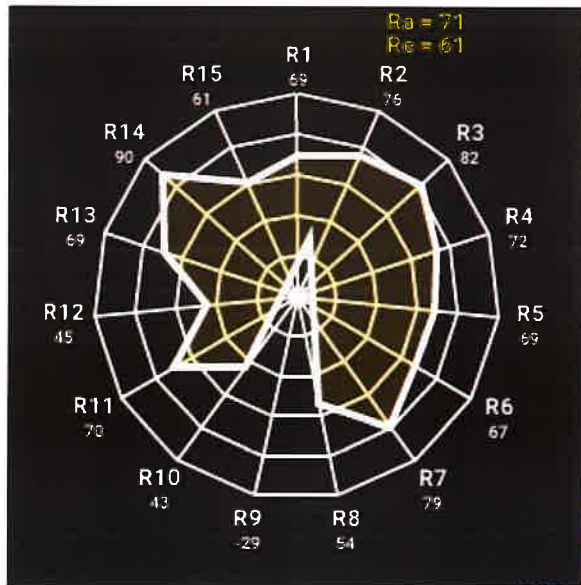
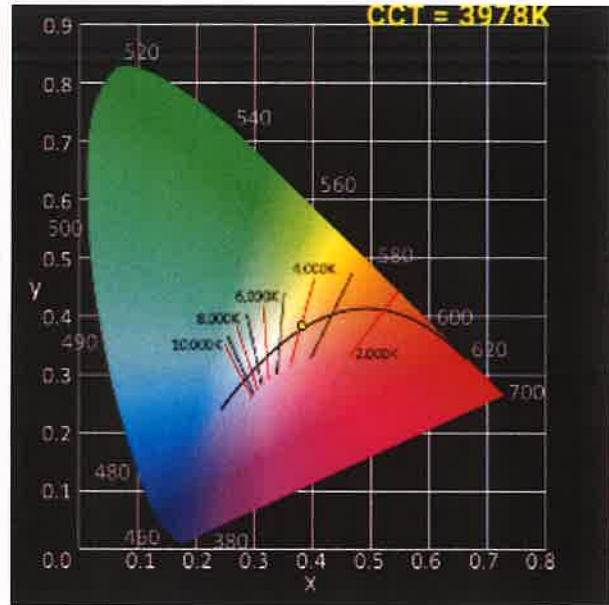
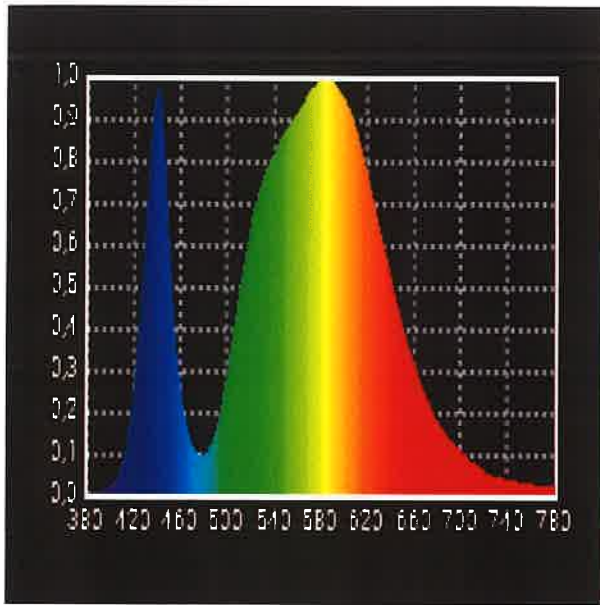
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**2.2 NW Spektrokolorimetrik Deney Sonuçları (spectrocolorimetric Test Results of the NW)**

**Spectral Power Distribution**



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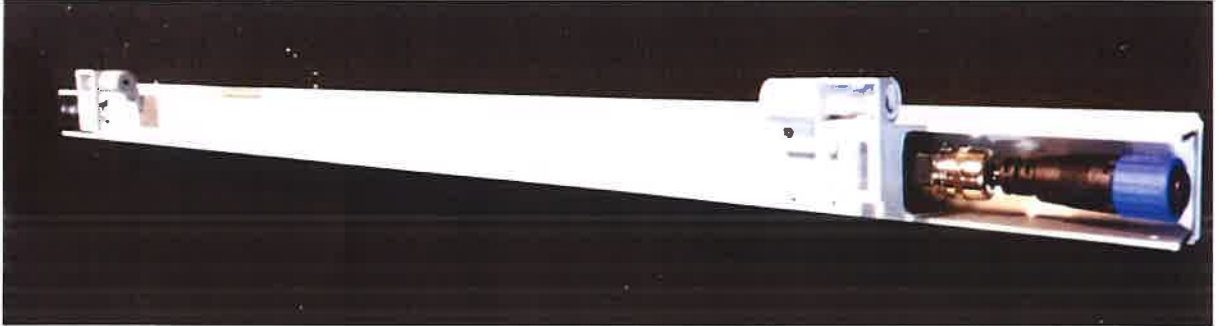
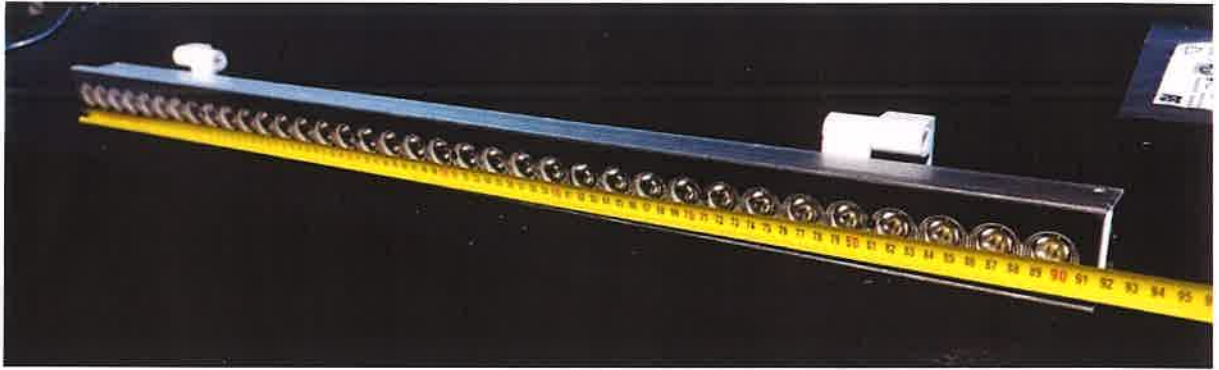
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**3.1 DGC'nin Fotoğrafları (Photos of EUT)**



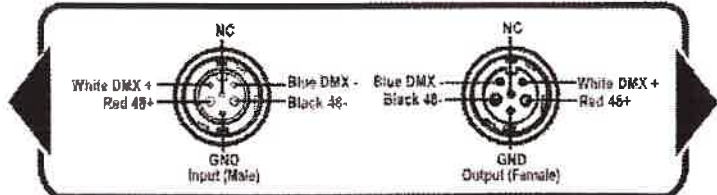
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