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**ÖLÇÜM RAPORU**  
MEASUREMENT REPORT

TL-806
19-TST-0095- 178
08-19

<b>Müşterinin Adı Adresi</b> Customer name/address	<b>: HERA EĞLENCE VE MİMARİ AYDINLATMA SİSTEMLERİ A.Ş.</b> Güllübağlar Mah. Kahramanlar Cad. No:3-1 34906 PENDİK- İSTANBUL/TÜRKİYE
<b>İstek Numarası</b> Order No	: 19-TST-0095
<b>Numunenin Adı ve Tarifi</b> Name and identity of test item	: Leoline® S12 915mm DMX SC WW Linear Spot Beam 14°
<b>Numunenin kabul tarihi</b> The date of receipt of test item	: <b>31.07.2019</b>
<b>Açıklamalar</b> Remarks	: <b>DGC'ye , IES LM-79-08 standardı uyarınca fotometrik ölçümler yapılmıştır.</b> Photometric measurement has been applied to EUT according to IESNA LM-79-08
<b>Deneyin Yapıldığı Tarih</b> Date of Test	: <b>02.08.2019</b>
<b>Raporun Sayfa Sayısı</b> Number of Pages of the Report	: <b>18</b>

Deney laboratuvarı olarak faaliyet gösteren TÜV AUSTRIA TURK, International Accreditation Service, Inc. (IAS) TL-806 ile TS EN ISO/IEC 17025 Nisan 2012 standardına göre akredite edilmiştir.  
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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 WW  
Linear Spot Beam 14°

**Seri Numarası / Serial Number**

: Test Numunesi  
Test Sample

**Beyan Gücü / Rated Power**

: 43,7 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 2700-3000K White Led	Binned at 85 °C • Thermal resistance: 5 °C/W • Wide viewing angle: 115°-140° Maximum drive current: White 1.5 A, Royal Blue 1.5 A Maximum Vf for High Efficacy XT-E White: 2.85 V Available in 2200 K CCT	UL (E349212) RoHS REACH
PCB	PCB	C13088_R1.1	0.8mm FR4 4 Layers 35+35+35+35umCu/ BlackSolderMask/Whi teSilkScreen	IPC A 600 J Class II Revizyon J standardı (COC) IPC 6012 Class II UL FCC
LENS	LEDIL	CA11016_TJNA2-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 mühürlü raporlar geçersizdir.

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

(Electrical Measurements)

<b>Ölçülen Güç (W)</b> (Input Power)	45,50 W
<b>Ölçülen Gerilim (V)</b> (Input Voltage)	46,92 VDC
<b>Ölçülen Akım (A)</b> (Input Current)	0,97 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 49% 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)	3110,5
<b>Maksimum Işık Şiddeti</b> (Max. Light Intensity) (cd)	20391
<b>Armatür Etkinliği</b> (Luminaire Efficacy) (lm/W)	68,36



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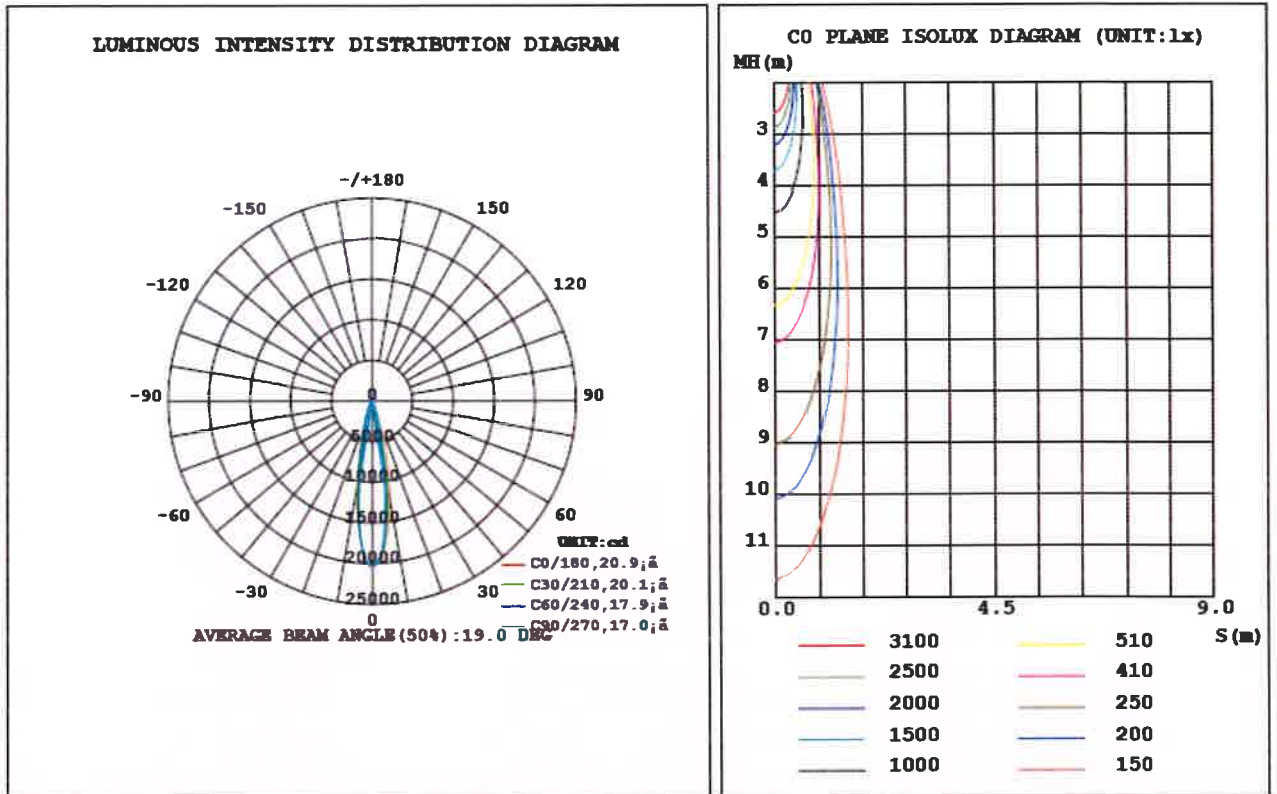
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**2.1 WW Fotometrik Deney Sonuçları (Photometric Test Results of the WW)**



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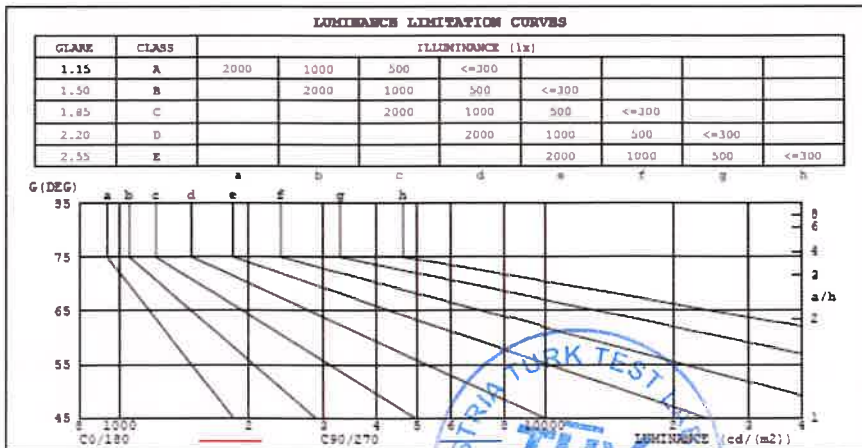
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**2.1 WW Fotometrik Deney Sonuçları (Photometric Test Results of the WW )**

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

**ZONAL FLUX DIAGRAM:**

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\phi_{zone}$	$\phi_{total}$	lum, lamp
5	1693	1662	1637	1702	1771	1732	1662	1667	0- 5	444.4	444.4	24.3,11.3
10	1091	922.6	784.9	936.1	1143	963.0	786.2	906.8	5- 10	908.9	1353	43.5,43.5
15	490.4	409.0	225.2	387.9	516.5	382.1	305.9	390.8	10- 15	732.0	2085	67.47
20	222.6	197.1	152.3	173.6	208.9	171.2	129.5	175.0	15- 20	441.9	2527	81.2,81.2
25	99.85	98.53	66.93	82.29	82.21	80.59	51.86	78.12	20- 25	258.8	2783	89.5,89.5
30	40.32	46.63	27.53	37.11	34.28	36.13	21.38	32.44	25- 30	135.7	2919	93.8,93.8
35	17.39	22.08	12.30	18.41	14.18	16.82	9.752	14.68	30- 35	69.22	2988	96.1,96.1
40	8.466	10.77	6.471	8.627	7.446	8.346	5.443	7.199	35- 40	36.58	3024	97.2,97.2
45	5.082	6.241	3.906	5.187	4.769	5.082	3.376	4.720	40- 45	22.04	3046	97.9,97.9
50	3.759	4.512	2.789	4.108	3.688	3.755	2.728	3.882	45- 50	16.66	3062	98.3,98.3
55	2.984	3.734	2.195	3.402	2.896	3.146	1.874	3.131	50- 55	14.59	3078	98.5,98.5
60	2.360	2.731	1.544	2.610	2.259	2.424	1.402	2.807	55- 60	11.91	3090	99.2,99.2
65	1.809	1.808	0.9760	1.750	1.805	1.577	0.8678	1.566	60- 65	9.266	3099	99.6,99.6
70	1.260	0.9868	0.5408	0.9428	1.326	0.8902	0.5011	0.8527	65- 70	6.013	3105	99.8,99.8
75	0.6903	0.4544	0.2391	0.4344	0.7972	0.4262	0.2474	0.4277	70- 75	3.320	3108	99.9,99.9
80	0.2415	0.1724	0.0874	0.1660	0.3087	0.1781	0.1065	0.1592	75- 80	1.871	3110	100,100
85	0.0291	0.0135	0.0025	0.0121	0.0544	0.0184	0.0086	0.0149	80- 85	0.4204	3110	100,100
90	0	0	0	0	0	0	0	0	85- 90	0.0148	3110	100,100
95	0	0	0	0	0	0	0	0	90- 95	0	3110	100,100
100	0	0	0	0	0	0	0	0	95-100	0	3110	100,100
105	0	0	0	0	0	0	0	0	100-105	0	3110	100,100
110	0	0	0	0	0	0	0	0	105-110	0	3110	100,100
115	0	0	0	0	0	0	0	0	110-115	0	3110	100,100
120	0	0	0	0	0	0	0	0	115-120	0	3110	100,100
125	0	0	0	0	0	0	0	0	120-125	0	3110	100,100
130	0	0	0	0	0	0	0	0	125-130	0	3110	100,100
135	0	0	0	0	0	0	0	0	130-135	0	3110	100,100
140	0	0	0	0	0	0	0	0	135-140	0	3110	100,100
145	0	0	0	0	0	0	0	0	140-145	0	3110	100,100
150	0	0	0	0	0	0	0	0	145-150	0	3110	100,100
155	0.0908	0.0114	0.0086	0.0087	0	0.0000	0	0	150-155	0.0013	3110	100,100
160	0.0397	0.0521	0.0517	0.0405	0.0115	0.0118	0.0060	0.0081	155-160	0.0249	3110	100,100
165	0.0748	0.0977	0.1105	0.0756	0.0268	0.0281	0.0222	0.0201	160-165	0.0664	3110	100,100
170	0.1052	0.1270	0.1429	0.1059	0.0414	0.0346	0.0382	0.0358	165-170	0.0802	3110	100,100
175	0.1084	0.1246	0.1224	0.1081	0.0505	0.0451	0.0409	0.0475	170-175	0.0875	3110	100,100
180	0.0954	0.0944	0.0781	0.0897	0.0974	0.0955	0.0762	0.0840	175-180	0.0200	3110	100,100



LUMINANCE cd/(m2)		
G (DEG)	C0/180	C90/270
85	44	4
50	139	56
75	267	92
70	268	135
65	428	231
60	472	309
55	520	382
50	555	434
45	719	552

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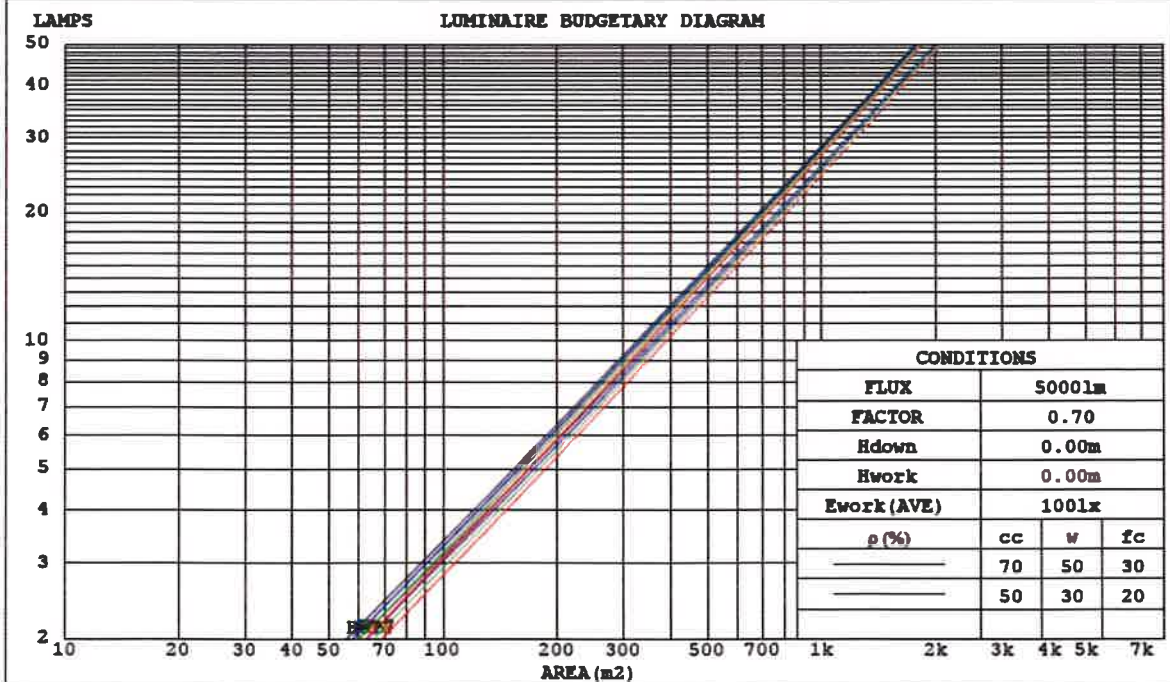
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**2.1 WW Fotometrik Deney Sonuçları (Photometric Test Results of the WW )**

**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
ρ <sub>v</sub>	20%			20%			20%			20%			20%			0
ρ <sub>fc</sub>	20%			20%			20%			20%			20%			0
<b>RCR</b>	<b>RCR:Room Cavity Ratio</b>						<b>Coefficients of Utilization (CU)</b>									
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	1.09	1.11	1.09	1.08	1.07	1.06	1.04	1.03	1.02	1.01	.00	.99	.98	.97
2.0	1.08	1.06	1.02	1.06	1.04	1.01	1.03	1.01	.99	1.00	.99	.97	.98	.96	.96	.94
3.0	1.03	.00	.97	1.02	.99	.96	.00	.97	.96	.97	.95	.93	.95	.94	.92	.91
4.0	.00	.96	.93	.99	.96	.92	.97	.94	.91	.95	.92	.90	.93	.91	.89	.88
5.0	.96	.92	.89	.95	.92	.89	.94	.91	.88	.92	.90	.87	.91	.89	.87	.86
6.0	.93	.89	.86	.93	.89	.86	.91	.88	.85	.90	.87	.85	.89	.86	.84	.83
7.0	.90	.86	.84	.90	.86	.83	.89	.86	.83	.88	.85	.83	.87	.84	.82	.81
8.0	.88	.84	.81	.88	.84	.81	.87	.83	.81	.86	.83	.81	.86	.82	.80	.79
9.0	.86	.82	.79	.85	.82	.79	.85	.81	.79	.84	.81	.79	.83	.80	.78	.78
10.0	.84	.80	.77	.83	.80	.77	.83	.79	.77	.82	.79	.77	.81	.79	.77	.76





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

**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	.135	.076	.024	.128	.073	.023	.116	.066	.021	.104	.060	.019	.094	.054	.017	
2.0	.124	.068	.021	.119	.066	.020	.109	.061	.019	.099	.056	.017	.091	.051	.016	
3.0	.116	.061	.018	.111	.059	.018	.103	.056	.017	.095	.052	.016	.087	.048	.015	
4.0	.108	.056	.016	.104	.054	.016	.097	.051	.015	.090	.048	.015	.084	.046	.014	
5.0	.101	.052	.015	.098	.050	.015	.092	.048	.014	.086	.045	.014	.081	.043	.013	
6.0	.095	.048	.014	.093	.047	.013	.087	.045	.013	.082	.043	.013	.078	.041	.012	
7.0	.090	.045	.013	.088	.044	.012	.083	.042	.012	.079	.041	.012	.075	.039	.011	
8.0	.086	.042	.012	.084	.041	.012	.080	.040	.011	.076	.038	.011	.072	.037	.011	
9.0	.082	.039	.011	.080	.039	.011	.076	.038	.011	.073	.037	.010	.070	.036	.010	
10.0	.078	.037	.010	.076	.037	.010	.073	.036	.010	.070	.035	.010	.066	.034	.010	

$\rho_{cc}$	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	.148	.144	.135	.128	.098	.093	.088	.057	.054	.051	.018	.017	.017	
2.0	.150	.133	.118	.128	.114	.102	.088	.079	.071	.051	.046	.042	.016	.015	.014	
3.0	.135	.113	.096	.116	.098	.083	.079	.068	.059	.046	.040	.034	.015	.013	.011	
4.0	.122	.098	.079	.105	.085	.069	.072	.059	.049	.042	.035	.029	.013	.011	.009	
5.0	.111	.086	.066	.096	.074	.058	.066	.052	.041	.038	.030	.024	.012	.010	.008	
6.0	.102	.075	.056	.088	.065	.049	.061	.046	.035	.035	.027	.021	.011	.009	.007	
7.0	.094	.067	.048	.081	.058	.042	.056	.041	.030	.033	.024	.018	.011	.008	.006	
8.0	.088	.060	.042	.076	.052	.036	.052	.037	.026	.030	.022	.015	.010	.007	.005	
9.0	.082	.055	.036	.071	.047	.032	.049	.033	.022	.028	.020	.013	.009	.006	.004	
10.0	.077	.050	.032	.066	.043	.028	.046	.030	.020	.027	.018	.012	.009	.006	.004	



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

**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	3.7	4.3	3.9	4.4	4.6	1.6	2.2	1.8	2.4	2.5
3H	4.1	4.7	4.3	4.8	5.0	1.7	2.3	2.0	2.5	2.7
4H	4.2	4.7	4.4	4.9	5.1	1.7	2.3	2.0	2.5	2.7
6H	4.1	4.7	4.4	4.9	5.1	1.6	2.2	1.9	2.4	2.6
8H	4.1	4.6	4.4	4.9	5.1	1.6	2.1	1.9	2.4	2.6
12H	4.1	4.6	4.4	4.8	5.1	1.6	2.1	1.9	2.3	2.6
4H 2H	3.8	4.4	4.1	4.6	4.8	2.0	2.6	2.3	2.8	3.0
3H	4.3	4.8	4.6	5.0	5.3	2.2	2.7	2.5	3.0	3.2
4H	4.4	4.8	4.7	5.1	5.4	2.2	2.6	2.5	2.9	3.2
6H	4.4	4.8	4.7	5.1	5.4	2.1	2.5	2.5	2.9	3.2
8H	4.3	4.7	4.7	5.1	5.4	2.1	2.5	2.5	2.8	3.2
12H	4.3	4.6	4.7	5.0	5.4	2.0	2.4	2.4	2.7	3.1
8H 4H	4.3	4.7	4.7	5.0	5.4	2.2	2.5	2.6	2.9	3.3
6H	4.3	4.6	4.7	5.0	5.4	2.1	2.4	2.5	2.8	3.2
8H	4.2	4.5	4.7	4.9	5.4	2.1	2.3	2.5	2.7	3.2
12H	4.2	4.4	4.6	4.9	5.3	2.0	2.2	2.5	2.7	3.1
12H 4H	4.2	4.6	4.6	5.0	5.3	2.1	2.5	2.5	2.8	3.2
6H	4.2	4.5	4.7	4.9	5.4	2.1	2.3	2.5	2.7	3.2
8H	4.2	4.4	4.6	4.9	5.3	2.0	2.2	2.5	2.7	3.1
Variations with the observer position at spacings:										
S = 1.0H	+ 1.0 / - 1.4					+ 1.2 / - 1.7				
1.5H	+ 1.6 / - 1.4					+ 1.5 / - 1.3				
2.0H	+ 0.7 / - 1.2					+ 1.1 / - 1.9				

CIE Pub.117 Corrected 3110 lm Total Lamp Luminous Flux. (8log(F/F0) = 3.9)



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**2.1 WW Fotometrik Deney Sonuçları (Photometric Test Results of the WW)****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	80	89	84	80	89	83	80	77
0.80	97	92	88	96	91	88	95	91	88	84
1.00	101	96	92	100	96	92	99	96	91	88
1.25	106	100	96	104	99	96	102	98	96	91
1.50	107	103	100	106	102	99	104	100	98	94
2.00	109	105	102	108	104	102	106	102	100	96
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	115	113	112	113	112	110	109	108	107	100
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004 Suspended SEMINOM = 1.25										



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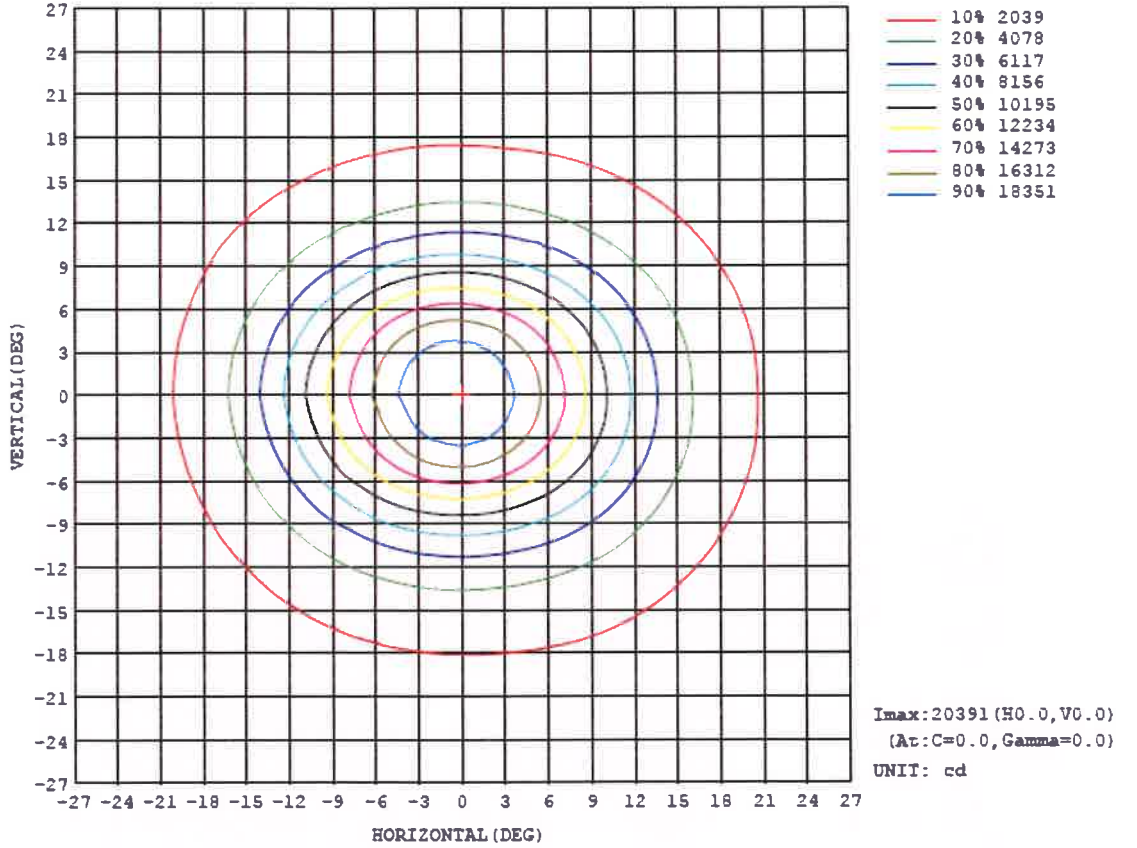
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**2.1 WW Fotometrik Deney Sonuçları (Photometric Test Results of the WW )**

**ISOCANDELA DIAGRAM**



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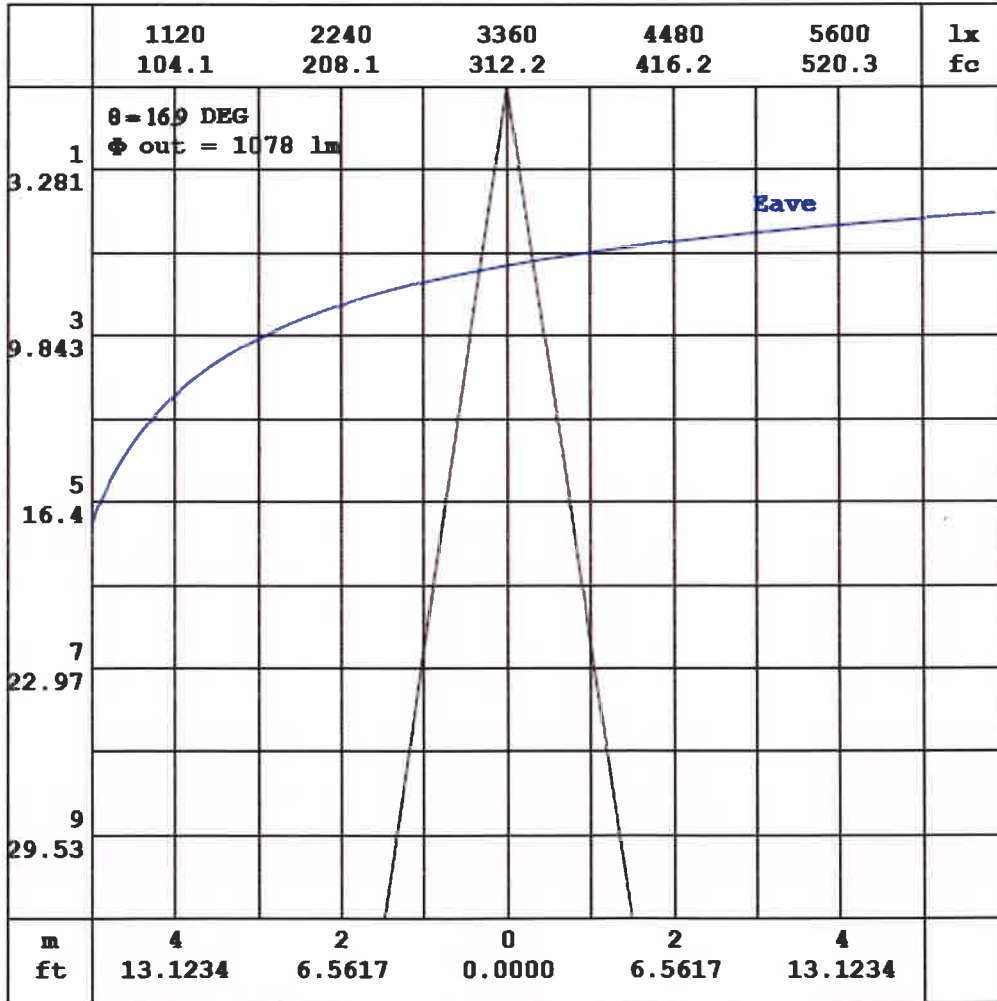
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**2.1 WW Fotometrik Deney Sonuçları (Photometric Test Results of the WW)**

**AAI CURVES**



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



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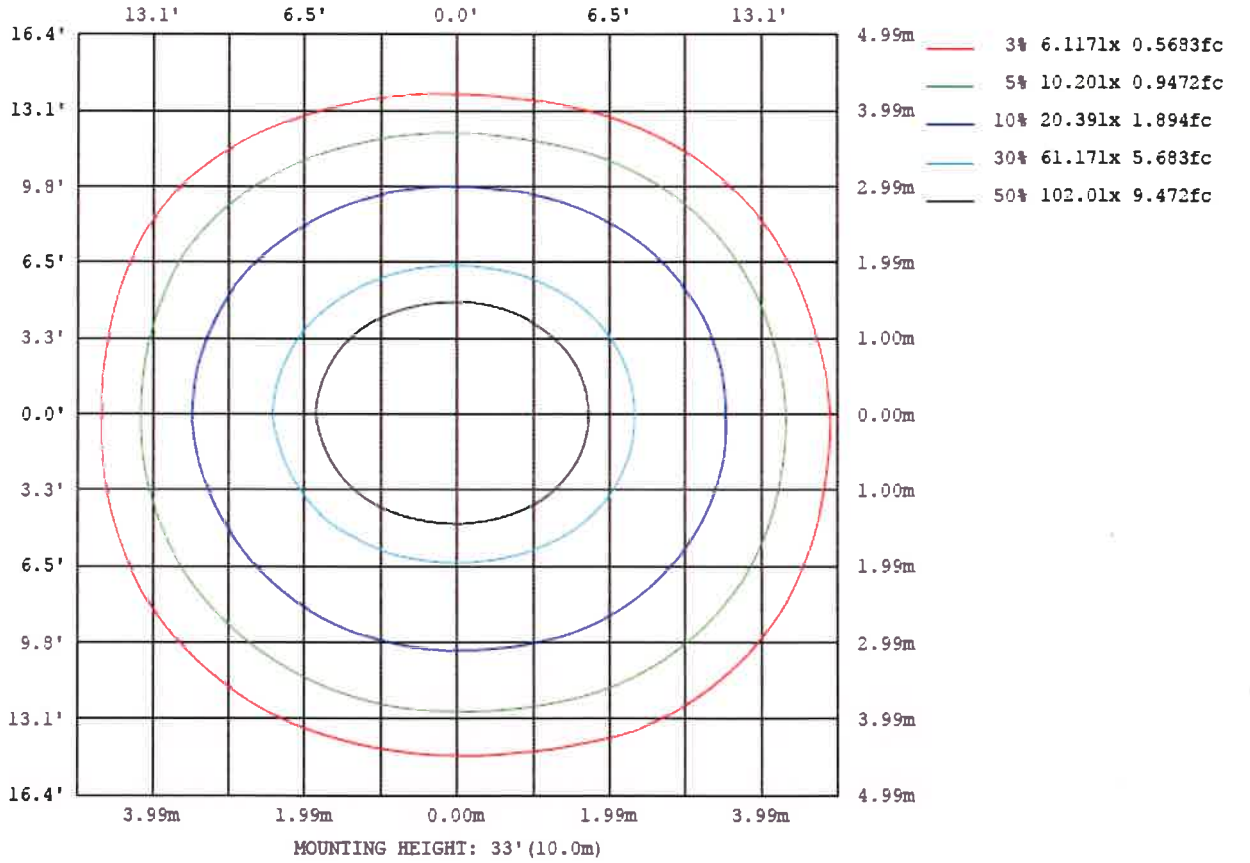
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**2.1 WW Fotometrik Deney Sonuçları (Photometric Test Results of the WW)**

**ISOLUX DIAGRAM**



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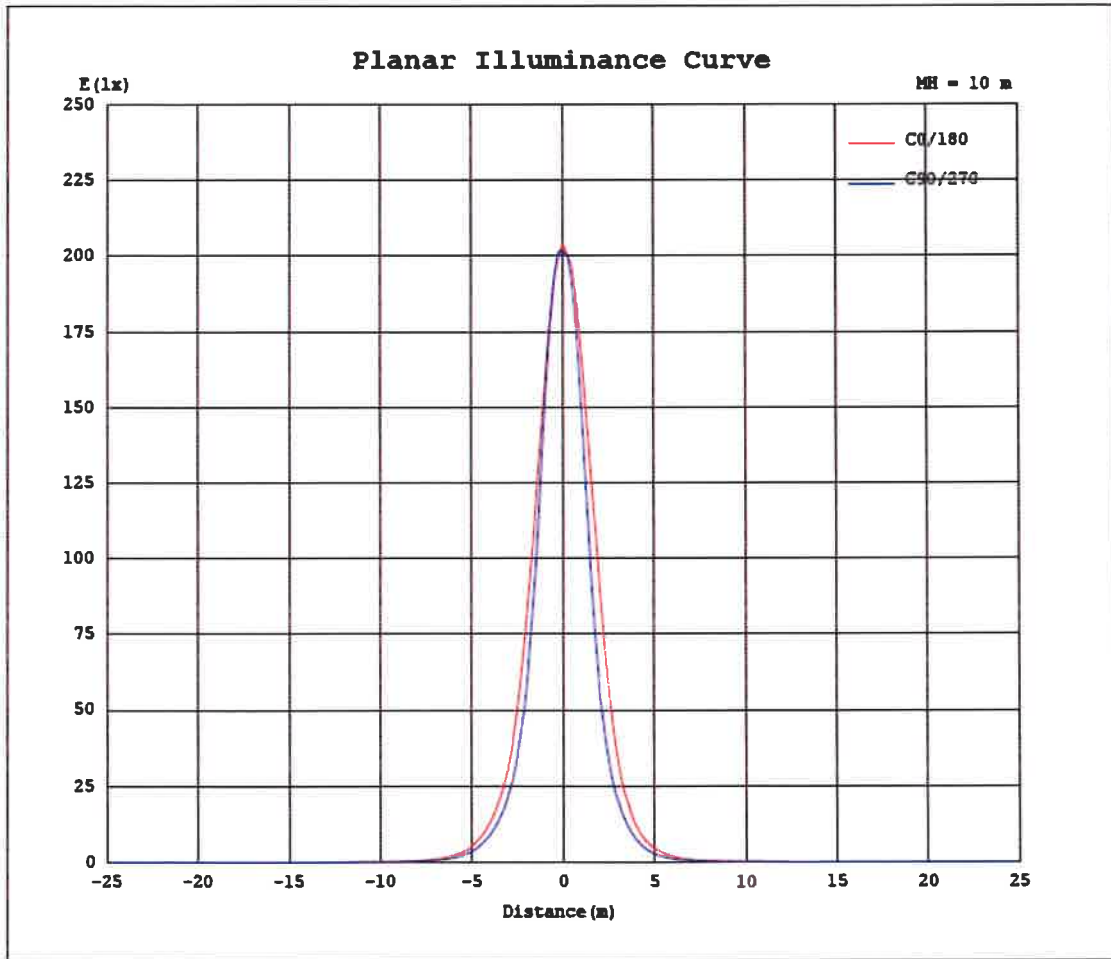
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**2.1 WW Fotometrik Deney Sonuçları (Photometric Test Results of the WW)**



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

(Electrical Measurements)

<b>Ölçülen Güç (W)</b> (Input Power)	45,50 W
<b>Ölçülen Gerilim (V)</b> (Input Voltage)	46,92 VDC
<b>Ölçülen Akım (A)</b> (Input Current)	0,97 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 49% Rh
<b>Stabilizasyon Süresi</b> (Stabilization Time)	60 dk ±5dk

**Spektrokolorimetrik Ölçüm Sonuçları**

(Spectrocolorimetric Measurement Results)

<b>Chrom x</b>	0,4331
<b>Chrom y</b>	0,4106
<b>Duv</b>	0,0032
<b>Chrom u'</b>	0,2453
<b>Chrom v'</b>	0,5234
<b>Peak</b>	593 nm
<b>Dominant</b>	581 nm
<b>CCT</b>	3119 K
<b>Nominal CCT</b>	-
<b>Ra(CRI)</b>	71
<b>R9</b>	-32
<b>S/P Ratio</b>	1,2
<b>Preburning time</b>	1 hr
<b>Test Configuration</b>	4π



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

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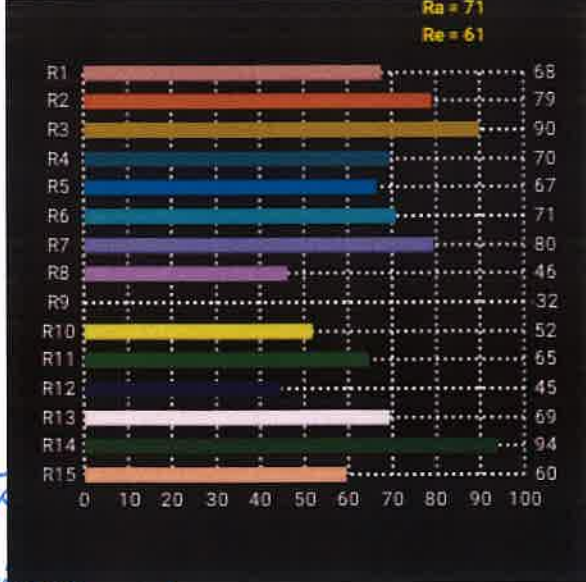
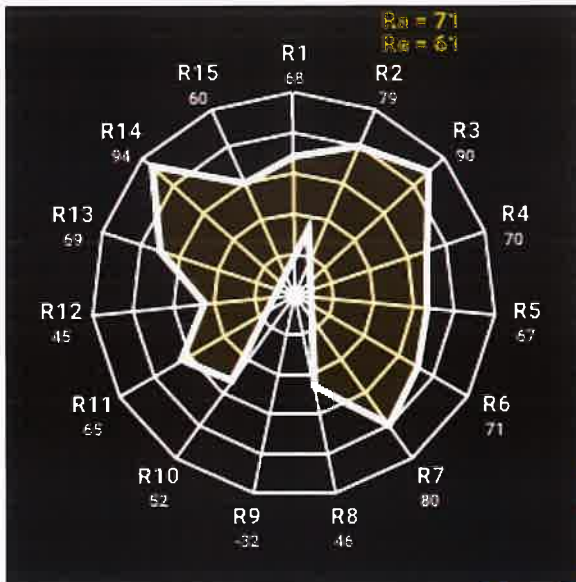
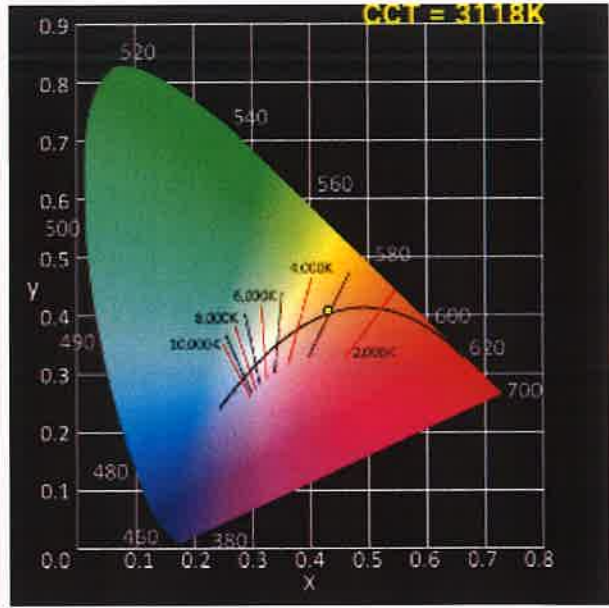
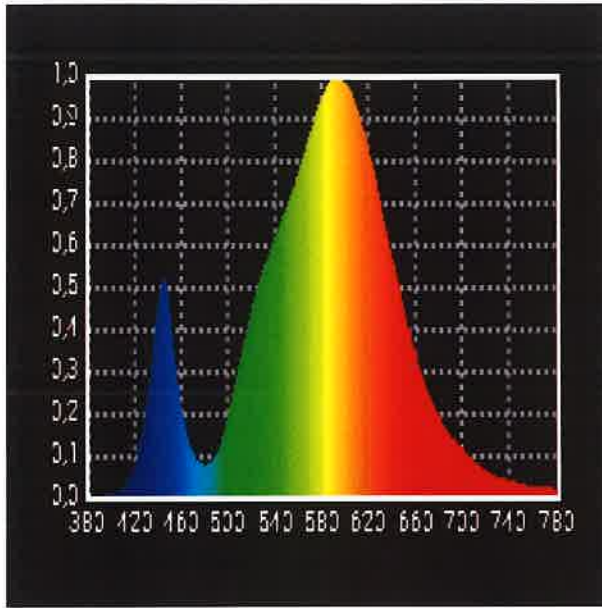
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**2.2 WW Spektrokolorimetrik Deney Sonuçları (spectrocolorimetric Test Results of the WW)**

**Spectral Power Distribution**



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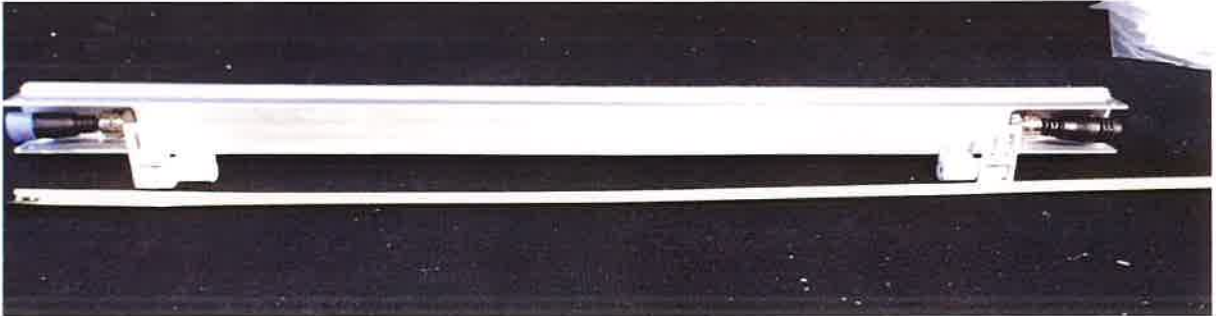
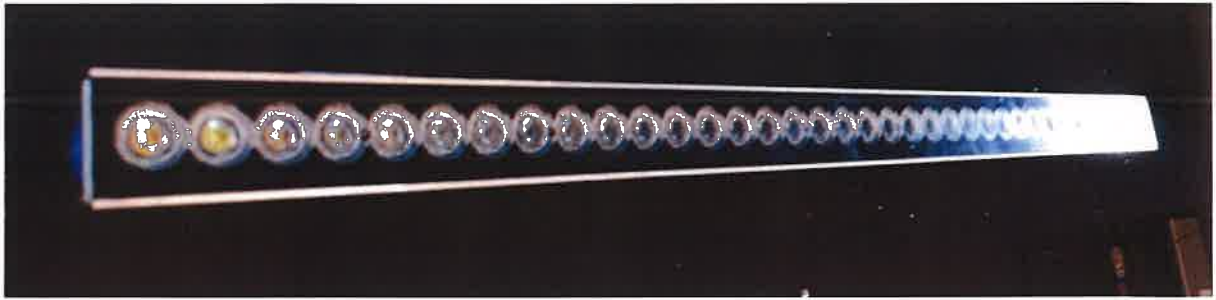
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**3.1 DGC'nin Fotoğrafları (Photos of EUT)**



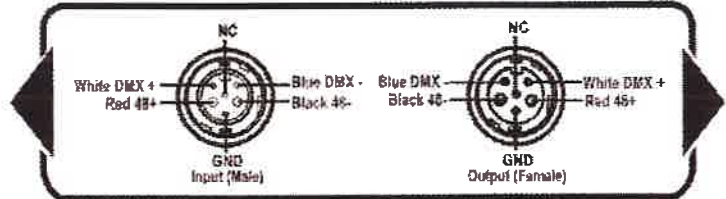
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