TÜV AUSTRIA TURK
Belgelendirme Eğitim ve Gözetim Hizmetleri Ltd. Şti.
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No:13/1 Ataşehir / İstanbul
Lab: 1. Organize Sanayi Uygurlar Cad. No:1
Sincan-Ankara / Turkey

IAS ACCREDITED Testing Laboratory

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806
19-TST-0095-175
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 RGBW Linear Asymmetric Beam 35+15°
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*	**: 01.08.2019**
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.
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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.

Mühür ve Tarih *Seal and Date*	**Deney Sorumlusu** *Person in charge of test*	**Onaylayan** *Approval*
TÜV AUSTRIA TURK LABORATUVAR 19.08.2019	**Gürhan CANSIZ**	**Gürhan CANSIZ**

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AUSTRIA TURK TEST LABORATUVARI TÜV AUSTRIA TURK

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ÖLÇÜM RAPORU
MEASUREMENT REPORT

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

Markası / *Brand*	: HERA
Modeli / *Model*	: Leoline® S12 915mm DMX RGBW Linear Asymmetric Beam 35+15°
Seri Numarası / *Serial Number*	: Test Numunesi *Test Sample*
Beyan Gücü / *Rated Power*	: 49,4 W
Beyan Gerilimi / *Rated Voltage*	: 48 VDC
Sembollerin Tanımı / *Defination 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 standarts):

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** *(NextbCalibration Date)*	**Kontrol** *(Check Point)*
LAB-011	Goniophotometer	09.01.2019	09.01.2020	☒
LAB-015	AC Power Supply	05.06.2018	05.06.2020	☒
LAB-027	Powermeter	09.01.2019	09.01.2020	☒
LAB-023	Standart Lamp	09.01.2019	09.01.2020	☒
LAB-012	İntegrating sphere	28.05.2018	28.05.2020	☒

1.3 Kompenent listesi *(Compenent list)*

Kompenent *(Componenets)*	**Üretici** *(Manufacturer)*	**Model** *(Model)*	**Teknik Bilgi** *(Technical Data)*	**Standart no.** *(Standart No.)*
LED	Cree Inc	XTEAWT 6500K White Led XPE2 Red XPEBRD Series Led XPE2 Green XPEBGR Series Led XPE2 Blue XPEBRY Series Led	Binned at 85 °C • Thermal resistance: 5 °C/W • Wide viewing angle: 110°-140° Unlimited floor life at ≤ 30 °C/85% RHMaximum drive current: 1 A	UL (E349212) RoHS REACh
PCB	PCB	C13093_R1.0	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 FQC
LENS	LEDIL	CA11052_TINA2-O-35+15	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 RGBW Fotometrik Deney Sonuçları *(Photometric Test Results of the RGBW)*

Elektriksel Ölçümler
(Electrical Measurements)

Ölçülen Güç (W) *(Input Power)*	48,13 W
Ölçülen Gerilim (V) *(Input Voltage)*	46,75 VDC
Ölçülen Akım (A) *(Input Current)*	1,030 A
Güç Faktörü (PF) *(Power Factor)*	-
Ölçülen Frekans (Hz) *(Input Frequency)*	-
Ortam Sıcaklığı / Bağıl Nem *(Ambient Temperature / Relative Humidity)*	25,1 °C 50% Rh
Stabilizasyon Süresi *(Stabilization Time)*	60 dk ±5dk

Fotometrik Ölçüm Sonuçları
(Photometric Measurement Results)

Toplam Işık Akısı *(Total Luminuous Flux)* **(lm)**	1479,8
Maksimum Işık Şiddeti *(Max. Light Intensity)* **(cd)**	5359
Armatür Etkinliği *(Luminaire Efficacy)* **(lm/W)**	30,75

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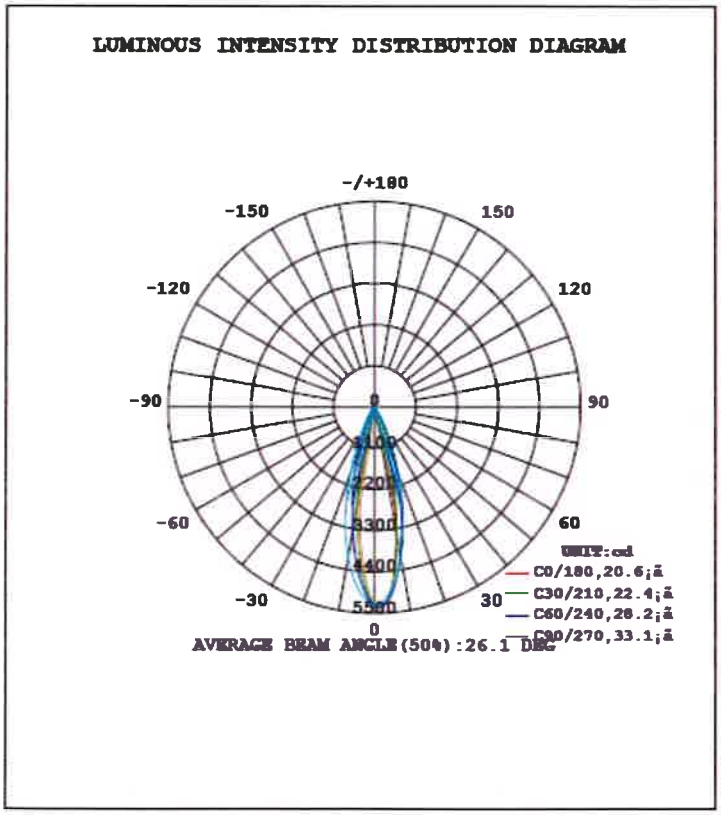
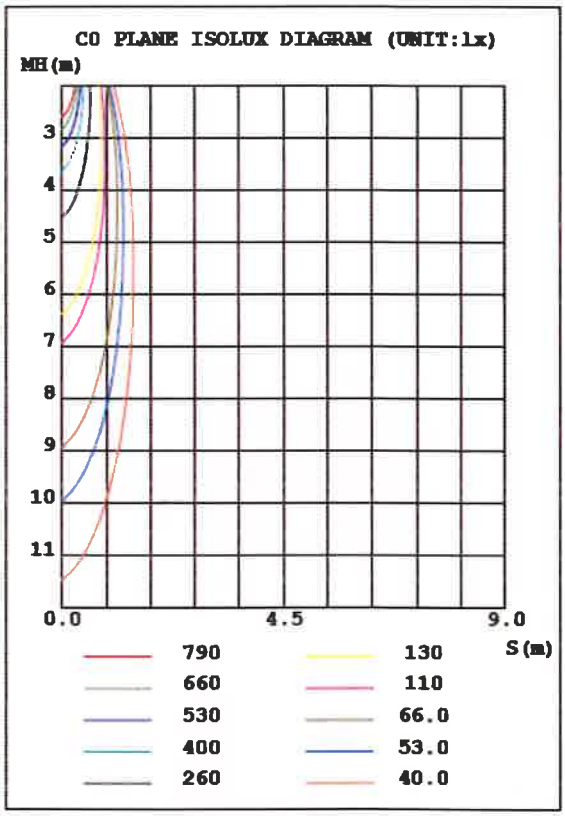
2.1 RGBW Fotometrik Deney Sonuçları *(Photometric Test Results of the RGBW)*





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

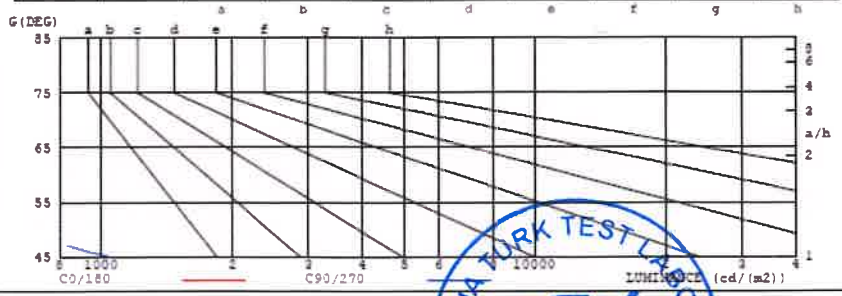
ZONAL FLUX DIAGRAM
AND LUMINANCE LIMITATION CURVES

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	ŋlum, lamp
5	4046	4223	4872	4950	4946	5020	4928	4425	0- 5	118.6	118.6	8.01,8.01
10	2426	2969	4047	3743	3238	3765	4119	3154	5- 10	287.4	406.0	27.4,27.4
15	1288	1762	2958	2205	1638	2216	3039	1963	10- 15	324.6	730.6	49.4,49.4
20	672.6	953.3	1840	1209	762.3	1226	1944	1089	15- 20	269.5	1000	67.6,67.6
25	342.0	494.1	1010	592.1	363.4	606.0	1086	565.7	20- 25	186.0	1186	80.2,80.2
30	165.7	257.5	516.4	290.2	189.5	295.6	562.2	288.1	25- 30	114.5	1301	87.9,87.9
35	89.19	135.2	264.6	146.7	96.80	146.2	287.8	150.6	30- 35	67.87	1369	92.5,92.5
40	50.30	75.75	138.1	80.67	55.41	79.20	149.0	82.08	35- 40	40.59	1409	95.2,95.2
45	27.46	44.56	73.64	48.18	26.93	46.75	77.85	48.17	40- 45	25.23	1434	96.9,96.9
50	27.24	29.49	38.73	30.08	28.25	28.79	40.00	30.26	45- 50	16.24	1451	98,98
55	20.06	20.02	20.61	19.81	20.69	19.22	21.48	19.75	50- 55	10.82	1462	98.8,98.8
60	14.61	13.12	11.62	13.10	15.26	12.47	11.41	12.87	55- 60	7.800	1469	99.2,99.2
65	10.27	7.956	6.338	7.714	10.79	7.415	6.235	7.581	60- 65	5.008	1474	99.6,99.6
70	6.317	4.298	3.428	4.266	6.736	4.249	3.440	4.201	65- 70	3.091	1477	99.8,99.8
75	3.073	2.028	1.617	2.100	3.611	2.146	1.671	2.020	70- 75	1.718	1479	99.9,99.9
80	1.128	0.5841	0.4635	0.6447	1.418	0.6898	0.5463	0.6179	75- 80	0.7493	1480	100,100
85	0.0755	0.0003	0	0.0009	0.2051	0.0078	0	0	80- 85	0.1722	1480	100,100
90	0	0	0	0	0	0	0	0	85- 90	0.0014	1480	100,100
95	0	0	0	0	0	0	0	0	90- 95	0	1480	100,100
100	0	0	0	0	0	0	0	0	95-100	0	1480	100,100
105	0	0	0	0	0	0	0	0	100-105	0	1480	100,100
110	0	0	0	0	0	0	0	0	105-110	0	1480	100,100
115	0	0	0	0	0	0	0	0	110-115	0	1480	100,100
120	0	0	0	0	0	0	0	0	115-120	0	1480	100,100
125	0	0	0	0	0	0	0	0	120-125	0	1480	100,100
130	0	0	0	0	0	0	0	0	125-130	0	1480	100,100
135	0	0	0	0	0	0	0	0	130-135	0	1480	100,100
140	0	0	0	0	0	0	0	0	135-140	0	1480	100,100
145	0	0	0	0	0	0	0	0	140-145	0	1480	100,100
150	0	0	0	0	0	0	0	0	145-150	0	1480	100,100
155	0	0	0.0889	0	0	0	0	0	150-155	0.0003	1480	100,100
160	0	0.0798	0.1941	0.0279	0	0	0	0	155-160	0.0042	1480	100,100
165	0.1261	0.1834	0.2613	0.1236	0	0	0	0	160-165	0.0097	1480	100,100
170	0.2136	0.2492	0.2846	0.2064	0.0177	0.0146	0.0042	0	165-170	0.0122	1480	100,100
175	0.2276	0.2608	0.2843	0.2273	0.0866	0.0726	0.0238	0.0127	170-175	0.0092	1480	100,100
180	0.2044	0.2438	0.2256	0.1883	0.2072	0.2323	0.1950	0.1727	175-180	0.0039	1480	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

LUMINANCE LIMITATION CURVES

GLARE	CLASS	ILLUMINANCE (lx)							
1.15	A	2000	1000	500	<=300				
1.50	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.20	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h



LUMINANCE cd/(m2)		
G(DEG)	C0/180	C90/270
85	9	0
80	66	28
75	119	62
70	195	100
65	243	150
60	292	232
55	350	359
50	424	602
45	530	1041

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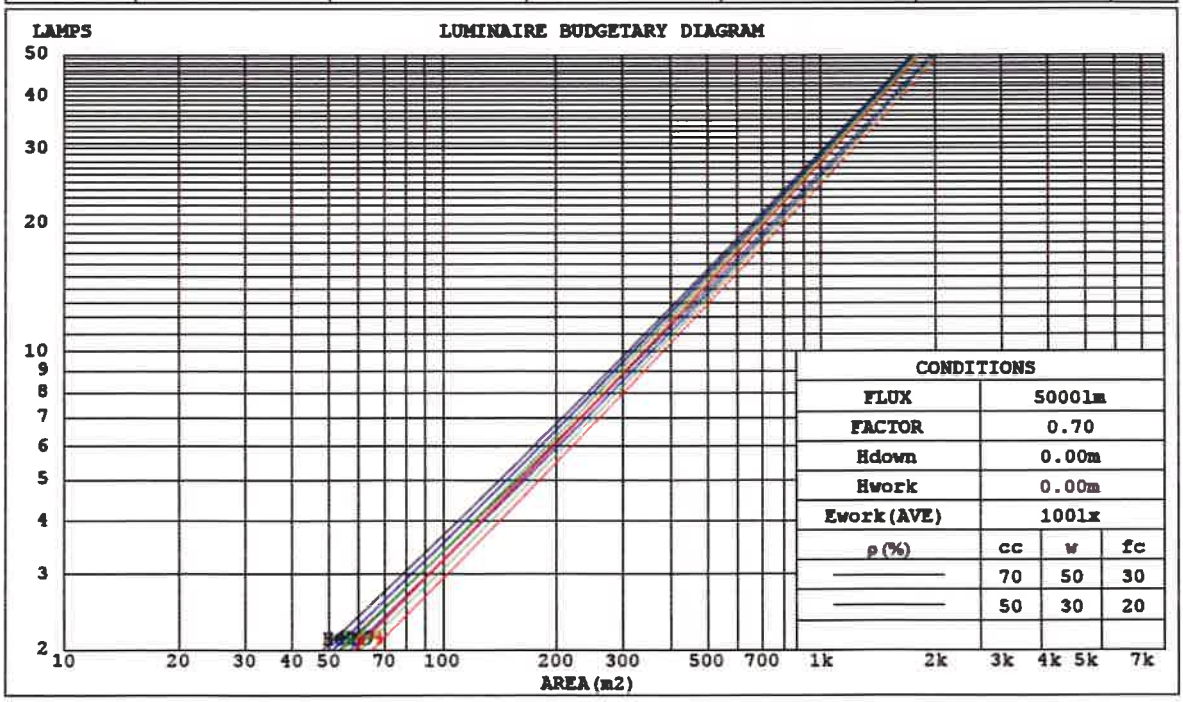
2.1 RGBW Fotometrik Deney Sonuçları *(Photometric Test Results of the RGBW)*

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	1.19	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	1.12	1.10	1.08	1.10	1.08	1.06	1.06	1.05	1.03	1.02	1.01	1.00	.99	.98	.97	.96
2.0	1.06	1.03	.00	1.04	1.01	.99	1.01	.99	.97	.98	.96	.95	.96	.94	.93	.91
3.0	1.01	.97	.93	.99	.96	.93	.97	.94	.91	.94	.92	.90	.92	.90	.88	.87
4.0	.96	.91	.88	.95	.91	.87	.93	.89	.86	.91	.88	.85	.89	.87	.85	.83
5.0	.92	.87	.83	.91	.86	.83	.89	.86	.82	.87	.84	.82	.86	.83	.81	.80
6.0	.88	.83	.80	.87	.83	.79	.86	.82	.79	.84	.81	.78	.83	.80	.78	.77
7.0	.84	.79	.76	.84	.79	.76	.82	.78	.76	.81	.78	.75	.80	.77	.75	.74
8.0	.81	.76	.73	.81	.76	.73	.80	.76	.73	.79	.76	.72	.78	.76	.72	.71
9.0	.78	.73	.70	.78	.73	.70	.77	.73	.70	.76	.72	.70	.76	.72	.70	.69
10.0	.75	.71	.68	.75	.71	.68	.74	.70	.68	.74	.70	.67	.73	.70	.67	.66



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

WEC AND CCEC

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						Wall Exitance Coeffcients(WEC)									
0.0																
1.0	.151	.086	.027	.145	.083	.026	.132	.076	.024	.121	.070	.022	.110	.064	.021	
2.0	.142	.078	.024	.137	.075	.023	.126	.070	.022	.117	.066	.021	.108	.061	.019	
3.0	.134	.071	.021	.129	.069	.021	.120	.065	.020	.112	.062	.019	.105	.058	.018	
4.0	.126	.065	.019	.122	.064	.019	.115	.061	.018	.108	.058	.017	.101	.055	.017	
5.0	.119	.061	.018	.116	.059	.017	.109	.057	.017	.103	.055	.016	.098	.052	.016	
6.0	.113	.057	.016	.110	.056	.016	.105	.054	.016	.099	.052	.015	.095	.050	.015	
7.0	.107	.053	.015	.105	.052	.015	.100	.051	.015	.096	.049	.014	.091	.047	.014	
8.0	.102	.050	.014	.100	.049	.014	.096	.048	.014	.092	.047	.013	.088	.045	.013	
9.0	.098	.047	.013	.096	.047	.013	.092	.046	.013	.089	.044	.013	.085	.043	.013	
10.0	.094	.045	.012	.092	.044	.012	.089	.043	.012	.086	.042	.012	.083	.042	.012	

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						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.190	.190	.190	.163	.163	.163	.111	.111	.111	.064	.064	.064	.020	.020	.020	
1.0	.169	.158	.147	.145	.135	.126	.099	.093	.087	.057	.054	.051	.018	.017	.016	
2.0	.152	.133	.116	.130	.114	.100	.089	.079	.070	.052	.046	.041	.017	.015	.013	
3.0	.138	.113	.094	.119	.098	.081	.081	.068	.057	.047	.040	.034	.015	.013	.011	
4.0	.127	.098	.077	.109	.085	.067	.075	.059	.047	.043	.035	.028	.014	.011	.009	
5.0	.117	.086	.064	.100	.075	.055	.069	.052	.039	.040	.031	.023	.013	.010	.008	
6.0	.108	.076	.054	.093	.066	.047	.064	.046	.033	.037	.027	.020	.012	.009	.006	
7.0	.101	.068	.046	.087	.059	.040	.060	.042	.028	.035	.025	.017	.011	.008	.006	
8.0	.095	.062	.039	.081	.054	.034	.056	.038	.024	.033	.022	.014	.011	.007	.005	
9.0	.089	.056	.034	.077	.049	.030	.053	.034	.021	.031	.020	.013	.010	.007	.004	
10.0	.084	.052	.030	.073	.045	.026	.050	.032	.019	.029	.019	.011	.010	.006	.004	

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

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	2.1	2.8	2.3	3.0	3.2	5.3	6.1	5.5	6.2	6.4
	3H	2.4	3.1	2.7	3.3	3.5	5.2	5.9	5.5	6.1	6.3
	4H	2.5	3.2	2.8	3.4	3.6	5.2	5.8	5.4	6.0	6.3
	6H	2.5	3.1	2.7	3.3	3.6	5.1	5.7	5.4	6.0	6.2
	8H	2.4	3.0	2.7	3.3	3.5	5.0	5.6	5.3	5.9	6.2
	12H	2.4	3.0	2.7	3.2	3.5	5.0	5.6	5.3	5.8	6.1
4H	2H	2.1	2.8	2.4	3.0	3.2	5.2	5.9	5.5	6.1	6.3
	3H	2.6	3.1	2.9	3.4	3.7	5.1	5.7	5.4	6.0	6.2
	4H	2.6	3.1	3.0	3.4	3.7	5.0	5.6	5.4	5.9	6.2
	6H	2.6	3.1	3.0	3.4	3.7	5.0	5.4	5.3	5.8	6.1
	8H	2.6	3.0	2.9	3.3	3.7	4.9	5.3	5.3	5.7	6.0
	12H	2.5	2.9	2.9	3.3	3.7	4.8	5.2	5.3	5.6	6.0
8H	4H	2.5	2.9	2.9	3.3	3.7	4.9	5.4	5.3	5.7	6.1
	6H	2.5	2.8	2.9	3.2	3.6	4.8	5.2	5.2	5.6	6.0
	8H	2.4	2.8	2.9	3.2	3.6	4.8	5.1	5.2	5.5	5.9
	12H	2.4	2.7	2.8	3.1	3.6	4.7	5.0	5.2	5.4	5.9
12H	4H	2.5	2.9	2.9	3.2	3.6	4.9	5.3	5.3	5.6	6.0
	6H	2.4	2.7	2.9	3.2	3.6	4.8	5.1	5.2	5.5	5.9
	8H	2.4	2.7	2.8	3.1	3.6	4.7	5.0	5.2	5.4	5.9
Variations with the observer position at spacings:											
S = 1.0H		+ 1.1 / - 1.6					+ 3.7 / - 5.3				
1.5H		+ 1.3 / - 1.1					+ 5.2 / - 4.3				
2.0H		+ 1.7 / - 1.5					+ 5.2 / - 4.2				

CIE Pub.117 Corrected 1480 lm Total Lamp Luminous Flux. (8log(F/F0) = 1.4)

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

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) x RCR = 5									
k = 0.60	89	82	79	88	82	79	87	82	79	76
0.80	96	90	87	95	90	86	94	89	86	83
1.00	100	95	91	99	94	91	98	94	90	87
1.25	104	99	96	103	98	95	101	97	94	90
1.50	106	102	99	105	101	98	103	100	97	93
2.00	109	105	102	108	104	101	105	102	100	95
2.50	111	107	104	109	106	103	106	103	101	95
3.00	112	109	106	110	107	105	107	105	103	97
4.00	114	111	109	112	110	108	108	107	105	98
5.00	116	113	111	113	111	110	109	108	107	99
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004				Suspended					SHRNOM = 1.25	

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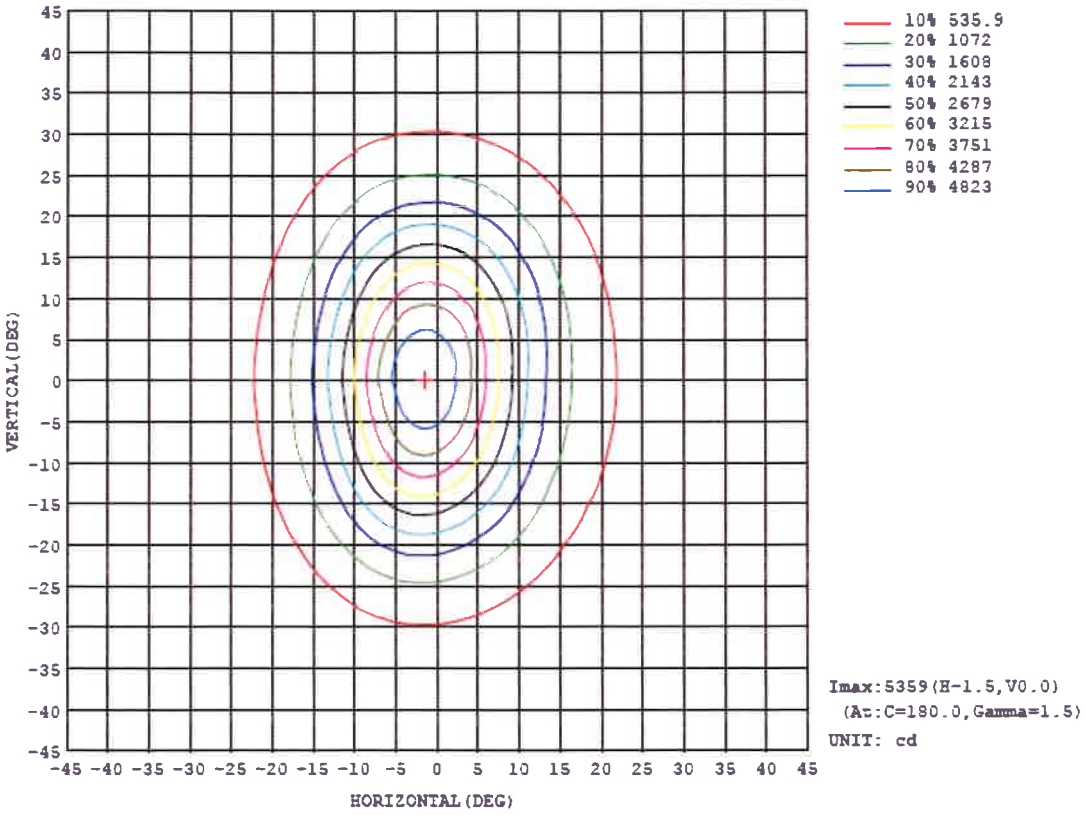
2.1 RGBW Fotometrik Deney Sonuçları *(Photometric Test Results of the RGBW)*

ISOCANDELA DIAGRAM



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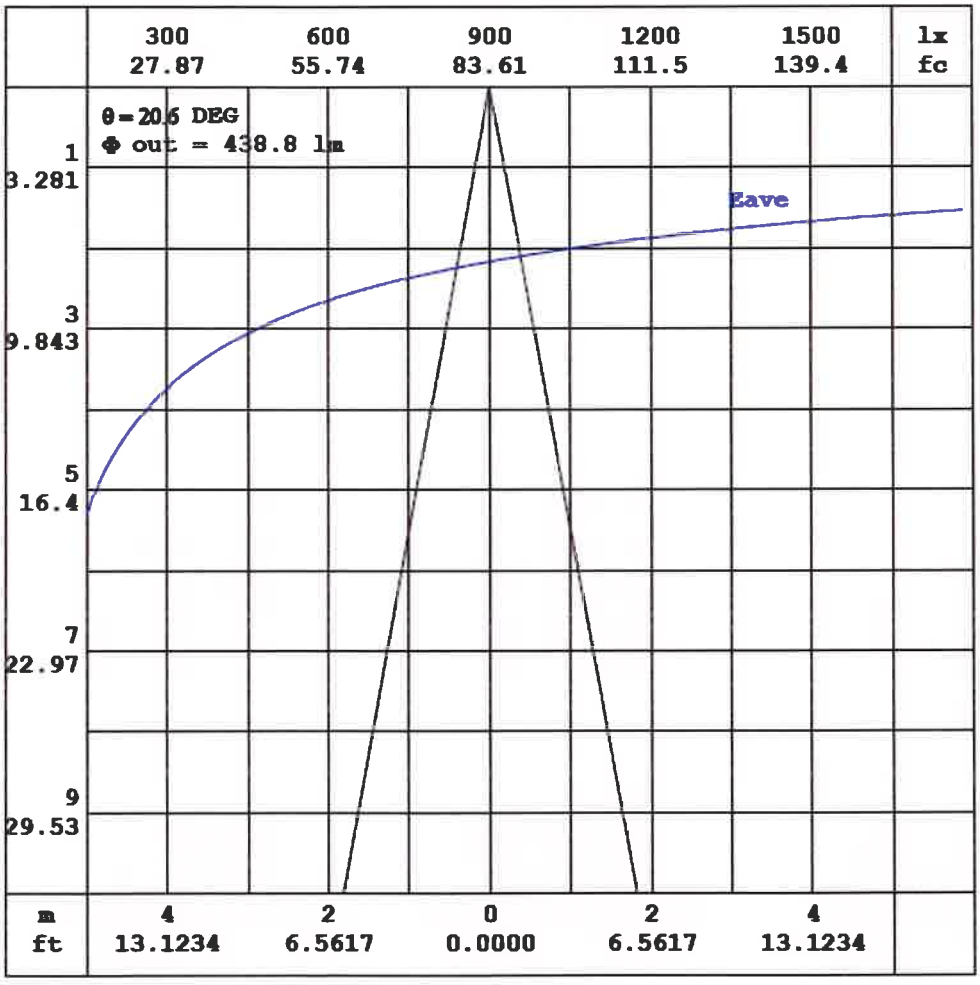
2.1 RGBW Fotometrik Deney Sonuçları *(Photometric Test Results of the RGBW)*

AAI CURVES



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

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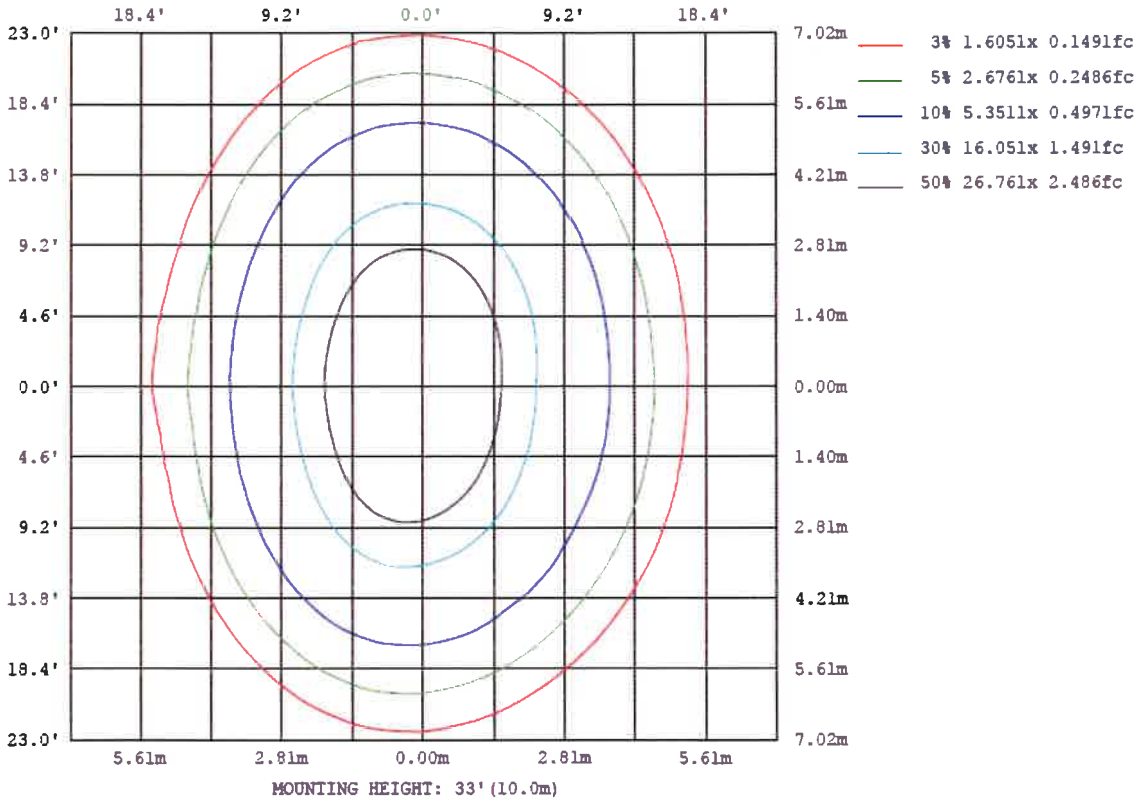
2.1 RGBW Fotometrik Deney Sonuçları *(Photometric Test Results of the RGBW)*

ISOLUX DIAGRAM



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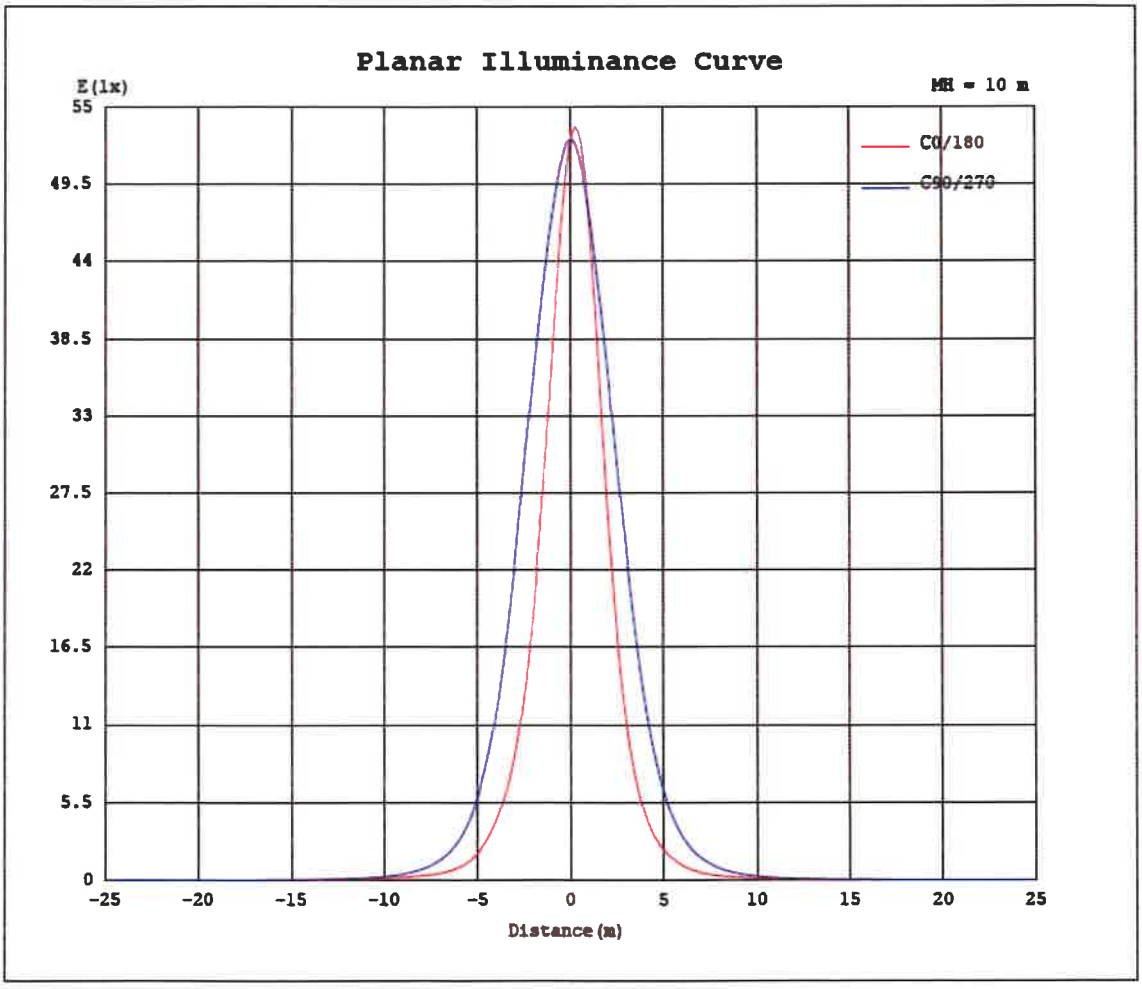
ÖLÇÜM RAPORU
MEASUREMENT REPORT

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



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

Elektriksel Ölçümler
(Electrical Measurements)

Ölçülen Güç (W) *(Input Power)*	48,13 W
Ölçülen Gerilim (V) *(Input Voltage)*	46,75 VDC
Ölçülen Akım (A) *(Input Current)*	1,030 A
Güç Faktörü (PF) *(Power Factor)*	-
Ölçülen Frekans (Hz) *(Input Frequency)*	-
Ortam Sıcaklığı / Bağıl Nem *(Ambient Temperature / Relative Humidity)*	25.1 °C 50% Rh
Stabilizasyon Süresi *(Stabilization Time)*	60 dk ±5dk

Spektrokolorimetrik Ölçüm Sonuçları
(Spectrocolorimetric Measurement Results)

Chrom x	0,3180
Chrom y	0,3382
Duv	0,0052
Chrom u'	0,1981
Chrom v'	0,4740
Peak	444 nm
Dominant	496 nm
CCT	6175 K
Nominal CCT	-
Ra(CRI)	70
R9	-32
S/P Ratio	1,9
Preburning time	1 hr
Test Configuration	4π

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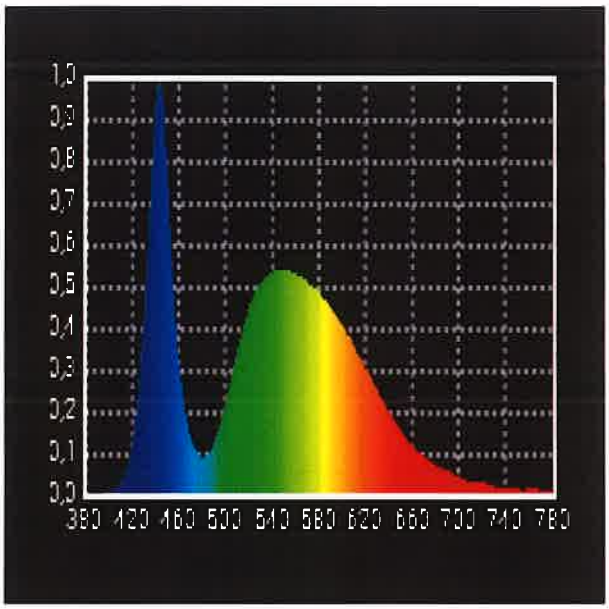
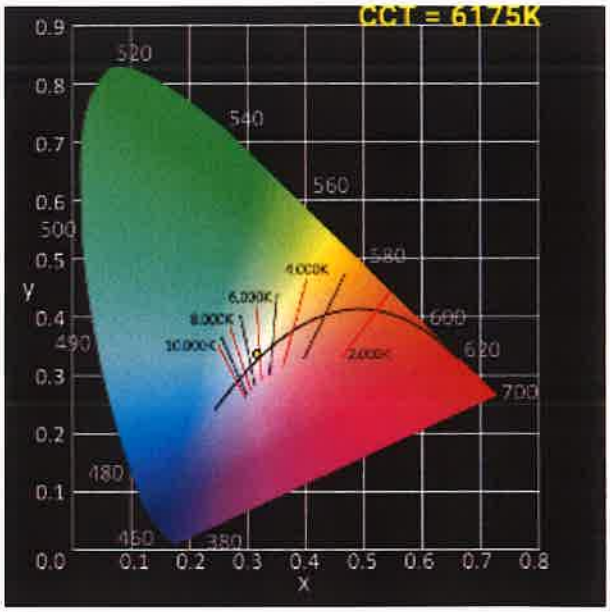
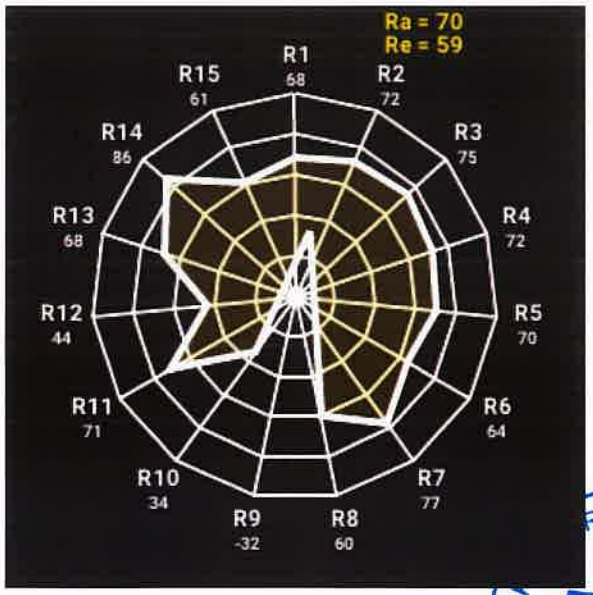
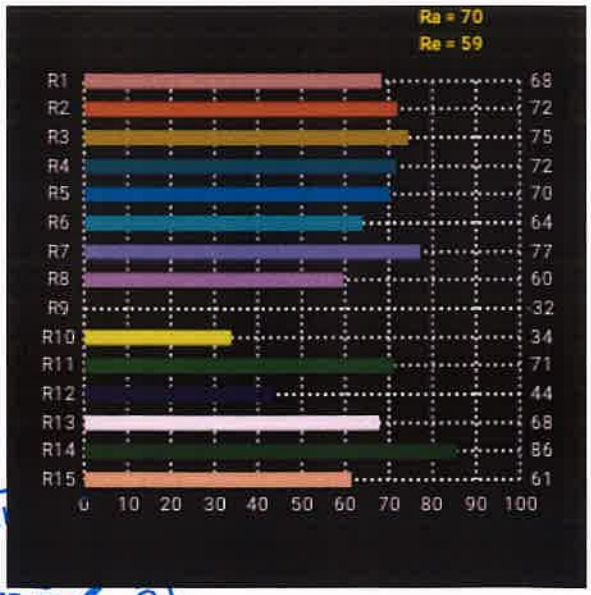
2.2 RGBW Spektrokolorimetrik Deney Sonuçları *(spectrocolorimetric Test Results of the RGBW)*

Spectral Power Distribution









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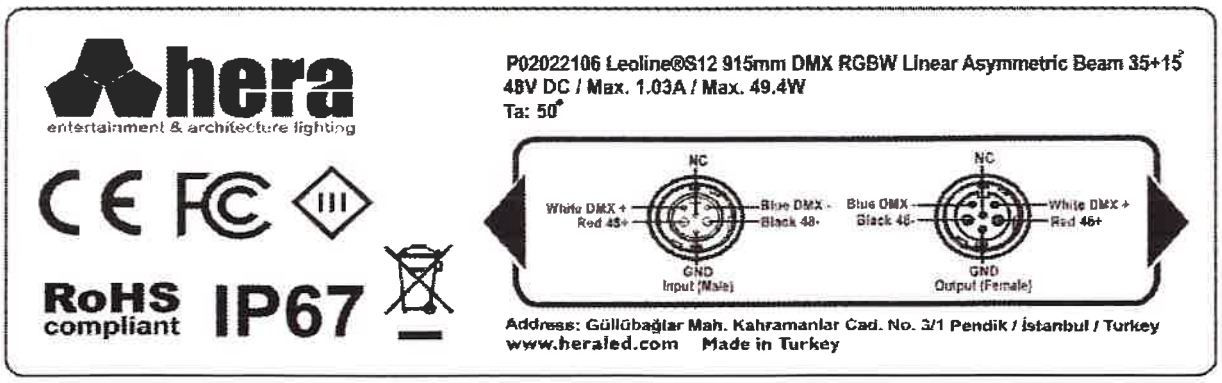
3.1 DGC'nin Fotoğrafları *(Photos of EUT)*



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