TÜV AUSTRIA TURK
Belgelendirme Eğitim ve Gözetim Hizmetleri Ltd. Şti.
Merkez: Barbaros Mah. Susuz Sok.
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-0095-183
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 RGB Linear Wide Flood Beam 60°
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.
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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 LABORATUVARI 19.08.2019	**Gürhan CANSIZ**	**Gürhan CANSIZ**

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ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806
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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 RGB Linear Wide Flood Beam 60°
Seri Numarası / *Serial Number*	: Test Numunesi *Test Sample*
Beyan Gücü / *Rated Power*	: 46.5 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	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% RH	UL (E349212) RoHS REACh
PCB	PCB	C13095_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	CA11076_TINA2-WW-60	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 RGB Fotometrik Deney Sonuçları *(Photometric Test Results of the RGB)*

Elektriksel Ölçümler
(Electrical Measurements)

Ölçülen Güç (W) *(Input Power)*	46,33 W
Ölçülen Gerilim (V) *(Input Voltage)*	46,83 VDC
Ölçülen Akım (A) *(Input Current)*	0,99 A
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 Luminuous Flux)* **(lm)**	1049,6
Maksimum Işık Şiddeti *(Max. Light Intensity)* **(cd)**	1084
Armatür Etkinliği *(Luminaire Efficacy)* **(lm/W)**	22,66

TÜV AUSTRIA TURK TEST LABORATUVARI

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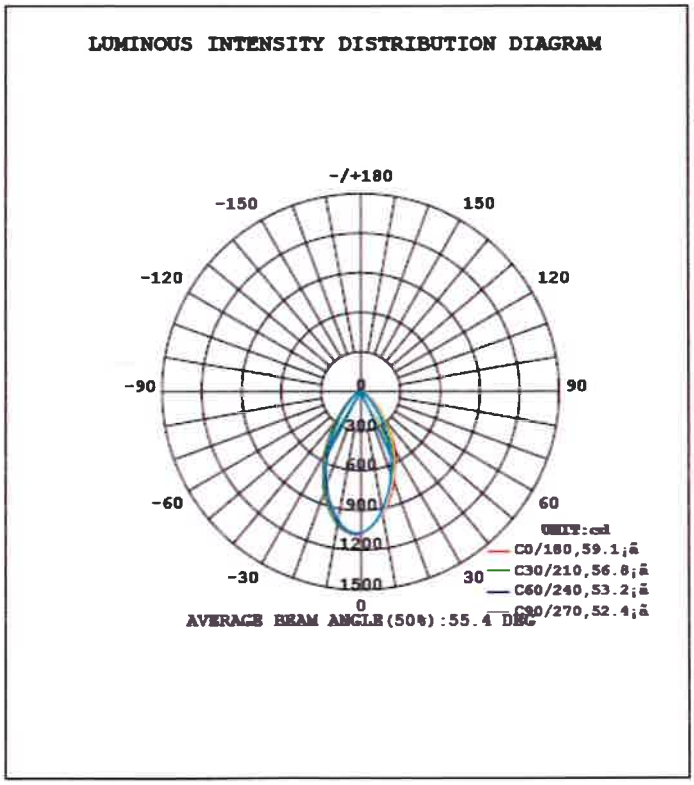
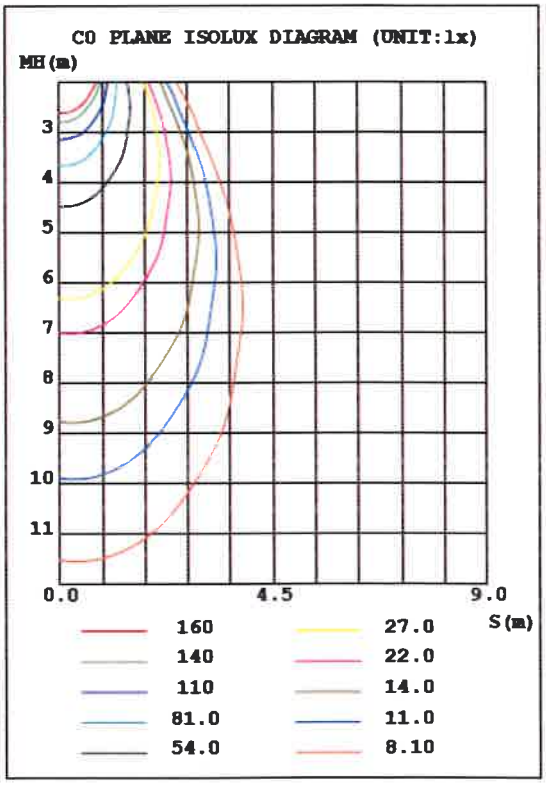
MEASUREMENT REPORT

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





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

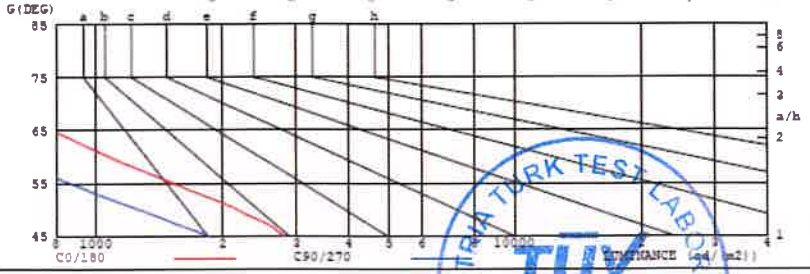
ZONAL FLUX DIAGRAM
AND LUMINANCE LIMITATION CURVES

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	Zlum.Lamp
5	1075	1067	1081	1027	1023	1014	1022	1040	0- 5	25.18	25.18	2.4,2.4
10	1022	1012	974.3	941.6	927.2	915.9	926.2	964.4	5- 10	71.49	96.68	9.21,9.21
15	923.9	915.8	863.2	826.8	825.2	798.6	807.3	858.6	10- 15	107.5	204.1	19.4,19.4
20	816.0	790.7	730.2	701.9	717.7	675.7	678.5	736.5	15- 20	130.2	334.3	31.9,31.9
25	676.8	647.2	586.6	580.2	609.6	559.4	549.1	602.5	20- 25	139.5	473.8	45.1,45.1
30	555.4	497.0	443.8	459.1	511.3	445.0	416.1	465.1	25- 30	135.8	609.6	58.1,58.1
35	417.9	362.6	310.2	335.1	383.5	326.3	289.9	343.6	30- 35	120.3	729.9	69.5,69.5
40	296.9	251.4	205.5	230.6	273.5	228.2	193.2	236.9	35- 40	96.67	826.6	78.8,78.8
45	196.9	164.5	130.7	154.0	199.6	152.9	125.2	156.4	40- 45	72.62	899.2	85.7,85.7
50	125.6	104.6	80.88	98.90	139.0	100.7	78.78	100.7	45- 50	52.48	951.7	90.7,90.7
55	86.87	68.04	49.58	63.22	88.17	64.42	49.21	63.27	50- 55	36.57	988.2	94.2,94.2
60	53.55	41.12	30.82	40.45	55.61	41.00	30.49	40.02	55- 60	24.64	1013	96.5,96.5
65	33.28	26.15	18.90	25.69	35.26	25.71	18.88	25.02	60- 65	16.32	1029	98.1,98.1
70	20.21	15.83	11.17	15.78	21.89	15.61	10.92	15.11	65- 70	10.49	1040	99.1,99.1
75	10.72	8.032	5.527	8.343	12.24	8.382	5.888	7.910	70- 75	6.206	1046	99.6,99.6
80	4.021	2.531	1.705	2.915	5.000	3.109	1.882	2.689	75- 80	2.915	1049	99.9,99.9
85	0.4522	0.0795	0.0221	0.2191	0.8946	0.3199	0.1003	0.1495	80- 85	0.7375	1050	100,100
90	0	0	0	0	0	0	0	0	85- 90	0.0222	1050	100,100
95	0	0	0	0	0	0	0	0	90- 95	0	1050	100,100
100	0	0	0	0	0	0	0	0	95-100	0	1050	100,100
105	0	0	0	0	0	0	0	0	100-105	0	1050	100,100
110	0	0	0	0	0	0	0	0	105-110	0	1050	100,100
115	0	0	0	0	0	0	0	0	110-115	0	1050	100,100
120	0	0	0	0	0	0	0	0	115-120	0	1050	100,100
125	0	0	0	0	0	0	0	0	120-125	0	1050	100,100
130	0	0	0	0	0	0	0	0	125-130	0	1050	100,100
135	0	0	0	0	0	0	0	0	130-135	0	1050	100,100
140	0	0	0	0	0	0	0	0	135-140	0	1050	100,100
145	0	0	0	0	0	0	0	0	140-145	0	1050	100,100
150	0	0	0	0	0	0	0	0	145-150	0	1050	100,100
155	0	0	0	0	0	0	0	0	150-155	0	1050	100,100
160	0	0	0	0	0	0	0	0	155-160	0	1050	100,100
165	0	0	0	0	0	0	0	0	160-165	0	1050	100,100
170	0	0	0	0	0	0	0	0	165-170	0	1050	100,100
175	0	0	0	0	0	0	0	0	170-175	0	1050	100,100
180	0	0	0	0	0	0	0	0	175-180	0	1050	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



LUMINANCE cd/(m2)		
G(DEG)	C0/180	C90/270
85	52	3
80	232	98
75	414	214
70	591	326
65	787	447
60	1071	616
55	1515	564
50	2136	1258
45	2784	1849

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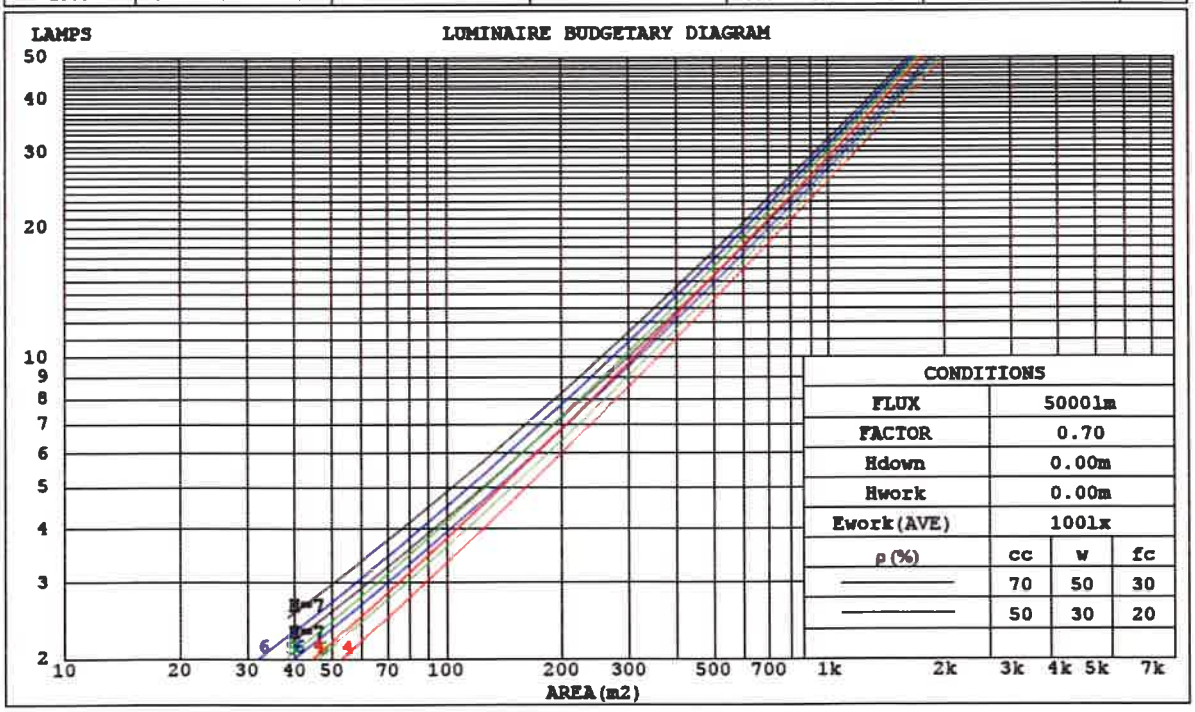
2.1 RGB Fotometrik Deney Sonuçları *(Photometric Test Results of the RGB)*

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	1.09	1.07	1.04	1.07	1.05	1.02	1.03	1.01	.99	.99	.98	.96	.96	.95	.94	.92
2.0	1.00	.96	.92	.99	.94	.91	.95	.92	.89	.92	.89	.87	.89	.87	.85	.83
3.0	.92	.87	.82	.91	.86	.81	.88	.84	.80	.86	.82	.79	.83	.80	.78	.76
4.0	.85	.79	.74	.84	.78	.74	.82	.77	.73	.80	.75	.72	.78	.74	.71	.69
5.0	.79	.72	.67	.78	.72	.67	.76	.71	.66	.74	.70	.66	.73	.69	.65	.64
6.0	.73	.67	.62	.72	.66	.62	.71	.65	.61	.69	.64	.61	.68	.64	.60	.59
7.0	.68	.62	.57	.68	.61	.57	.66	.61	.56	.65	.60	.56	.64	.59	.56	.54
8.0	.64	.57	.53	.63	.57	.53	.62	.56	.52	.61	.56	.52	.60	.55	.52	.50
9.0	.60	.53	.49	.59	.53	.49	.58	.53	.49	.57	.52	.49	.57	.52	.48	.47
10.0	.56	.50	.46	.56	.50	.46	.55	.49	.46	.54	.49	.45	.53	.49	.45	.44



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

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	.203	.115	.037	.196	.112	.035	.183	.105	.034	.171	.099	.032	.161	.093	.030	
2.0	.196	.107	.033	.190	.105	.032	.179	.100	.031	.169	.095	.030	.160	.091	.029	
3.0	.187	.099	.030	.182	.097	.029	.173	.094	.028	.164	.090	.028	.156	.086	.027	
4.0	.177	.092	.027	.173	.091	.027	.165	.087	.026	.157	.084	.025	.150	.082	.025	
5.0	.168	.086	.025	.164	.084	.025	.157	.082	.024	.151	.079	.024	.144	.077	.023	
6.0	.159	.080	.023	.156	.079	.023	.150	.077	.022	.144	.075	.022	.138	.073	.022	
7.0	.151	.075	.021	.149	.074	.021	.143	.072	.021	.138	.071	.021	.133	.069	.020	
8.0	.144	.070	.020	.141	.070	.020	.136	.068	.019	.132	.067	.019	.127	.065	.019	
9.0	.137	.066	.019	.135	.066	.018	.130	.064	.018	.126	.063	.018	.122	.062	.018	
10.0	.131	.063	.017	.129	.062	.017	.125	.061	.017	.121	.060	.017	.117	.059	.017	

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	.173	.157	.143	.148	.135	.123	.101	.093	.085	.058	.054	.049	.019	.017	.016	
2.0	.159	.132	.110	.137	.114	.095	.094	.079	.066	.054	.046	.039	.017	.015	.013	
3.0	.148	.114	.086	.127	.098	.075	.087	.068	.052	.050	.040	.031	.016	.013	.010	
4.0	.139	.099	.069	.119	.086	.060	.082	.060	.042	.047	.035	.025	.015	.011	.008	
5.0	.131	.088	.056	.113	.076	.049	.078	.053	.035	.045	.031	.021	.014	.010	.007	
6.0	.124	.079	.047	.107	.068	.041	.073	.048	.029	.043	.028	.017	.014	.009	.006	
7.0	.118	.072	.040	.101	.062	.035	.070	.044	.024	.041	.026	.015	.013	.008	.005	
8.0	.112	.066	.034	.096	.057	.030	.067	.040	.021	.039	.024	.013	.013	.008	.004	
9.0	.107	.061	.030	.092	.053	.026	.064	.037	.018	.037	.022	.011	.012	.007	.004	
10.0	.102	.056	.026	.088	.049	.023	.061	.034	.016	.035	.020	.010	.012	.007	.003	

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MEASUREMENT REPORT

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

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	13.0	14.1	13.3	14.3	14.5	10.9	12.0	11.1	12.2	12.3
	3H	13.2	14.2	13.4	14.4	14.6	10.9	11.9	11.2	12.1	12.3
	4H	13.2	14.1	13.5	14.4	14.6	10.9	11.8	11.2	12.1	12.3
	6H	13.1	14.0	13.4	14.3	14.5	10.8	11.7	11.1	11.9	12.2
	8H	13.1	13.9	13.4	14.2	14.5	10.8	11.6	11.1	11.9	12.1
	12H	13.0	13.9	13.4	14.1	14.4	10.7	11.5	11.0	11.8	12.1
4H	2H	12.9	13.9	13.2	14.1	14.3	11.0	11.9	11.2	12.1	12.4
	3H	13.2	14.0	13.5	14.2	14.5	11.1	11.9	11.4	12.1	12.4
	4H	13.2	13.9	13.5	14.2	14.6	11.0	11.8	11.4	12.1	12.4
	6H	13.2	13.8	13.5	14.2	14.5	11.0	11.6	11.4	12.0	12.3
	8H	13.1	13.7	13.5	14.1	14.5	10.9	11.5	11.3	11.9	12.3
	12H	13.1	13.6	13.5	14.0	14.4	10.9	11.4	11.3	11.8	12.2
8H	4H	13.1	13.7	13.5	14.1	14.4	11.0	11.6	11.4	11.9	12.3
	6H	13.1	13.6	13.5	14.0	14.4	10.9	11.4	11.4	11.8	12.2
	8H	13.0	13.5	13.5	13.9	14.3	10.9	11.3	11.3	11.7	12.2
	12H	13.0	13.4	13.5	13.8	14.3	10.8	11.2	11.3	11.6	12.1
12H	4H	13.0	13.6	13.5	14.0	14.4	10.9	11.5	11.3	11.9	12.3
	6H	13.0	13.5	13.5	13.9	14.3	10.9	11.3	11.3	11.7	12.2
	8H	13.0	13.4	13.5	13.8	14.3	10.8	11.2	11.3	11.6	12.1
Variations with the observer position at spacings:											
S = 1.0H		+ 1.4 / - 2.3					+ 1.7 / - 3.0				
1.5H		+ 2.1 / - 1.9					+ 2.0 / - 2.0				
2.0H		+ 3.0 / - 2.7					+ 2.9 / - 2.6				

CIE Pub.117 Corrected 1050 lm Total Lamp Luminous Flux. (8log(F/F0) = 0.2)

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

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	78	70	65	77	70	65	77	69	65	61
0.80	87	79	74	86	79	74	85	78	74	69
1.00	93	86	81	92	85	81	90	86	80	76
1.25	98	91	87	97	91	87	95	90	86	81
1.50	101	95	91	100	95	91	98	93	90	84
2.00	105	100	96	104	99	96	101	97	94	88
2.50	108	103	99	106	102	98	103	99	96	90
3.00	110	105	102	108	104	101	104	101	99	92
4.00	112	109	106	110	107	104	106	104	102	94
5.00	113	111	108	111	109	107	107	105	104	96
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004				Suspended					SHRNOM = 1.25	

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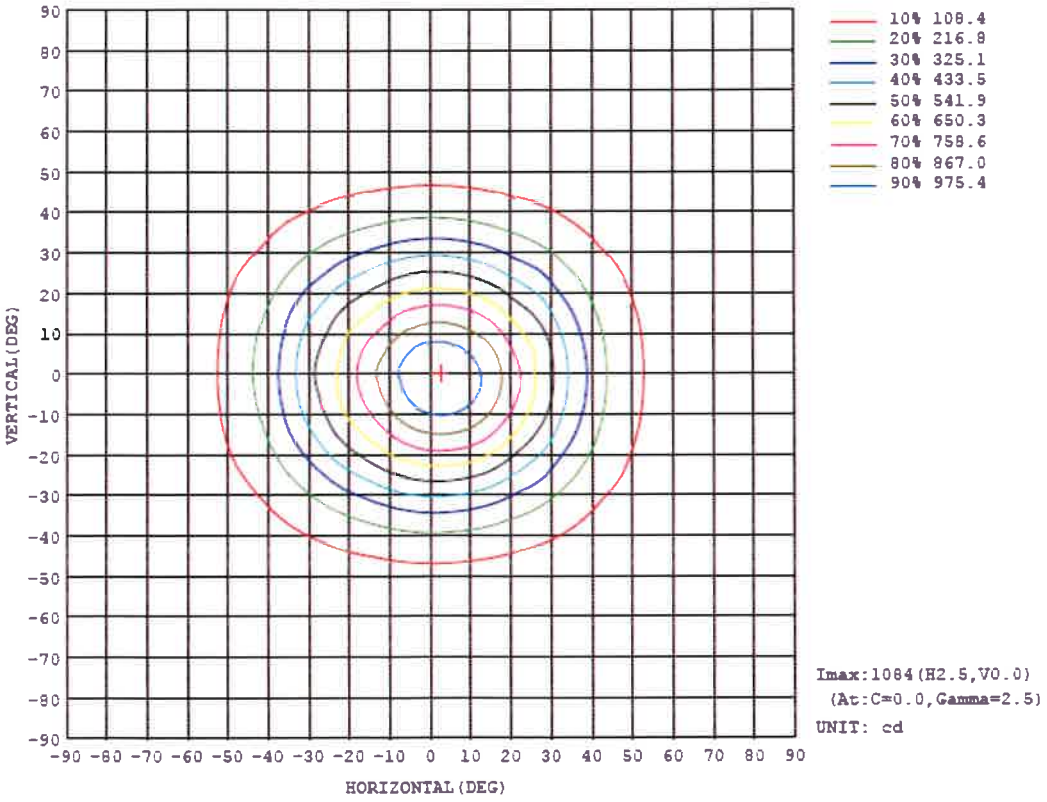
2.1 RGB Fotometrik Deney Sonuçları *(Photometric Test Results of the RGB)*

ISOCANDELA DIAGRAM



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Belgelendirme Eğitim ve Gözetim Hizmetleri Ltd. Şti.
Merkez: Barbaros Mah. Susuz Sok.
No:13/1 Ataşehir / İstanbul
Lab: 1. Organize Sanayi Uygurlar Cad. No:1
Sincan-Ankara / Turkey

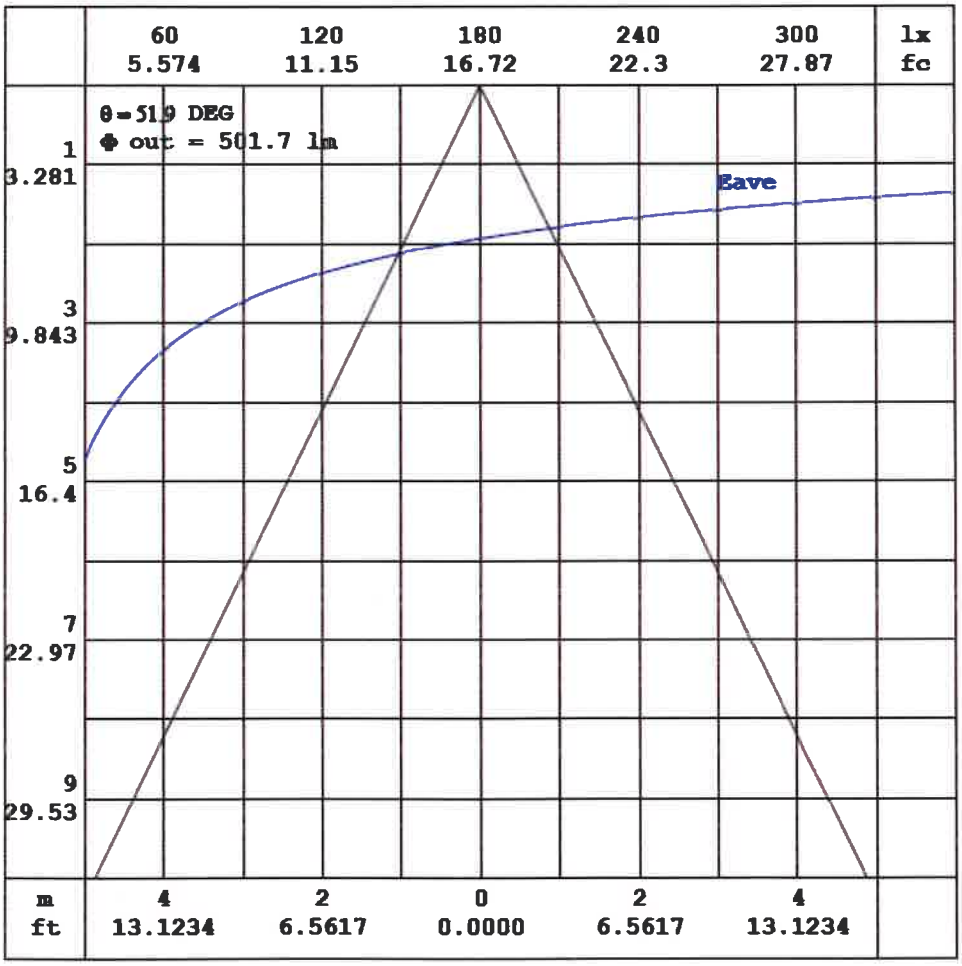
IAS ACCREDITED Testing Laboratory

ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806
19-TST-0095-183
08-19

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

AAI CURVES



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

TÜV AUSTRIA TURK TEST LABORATORY

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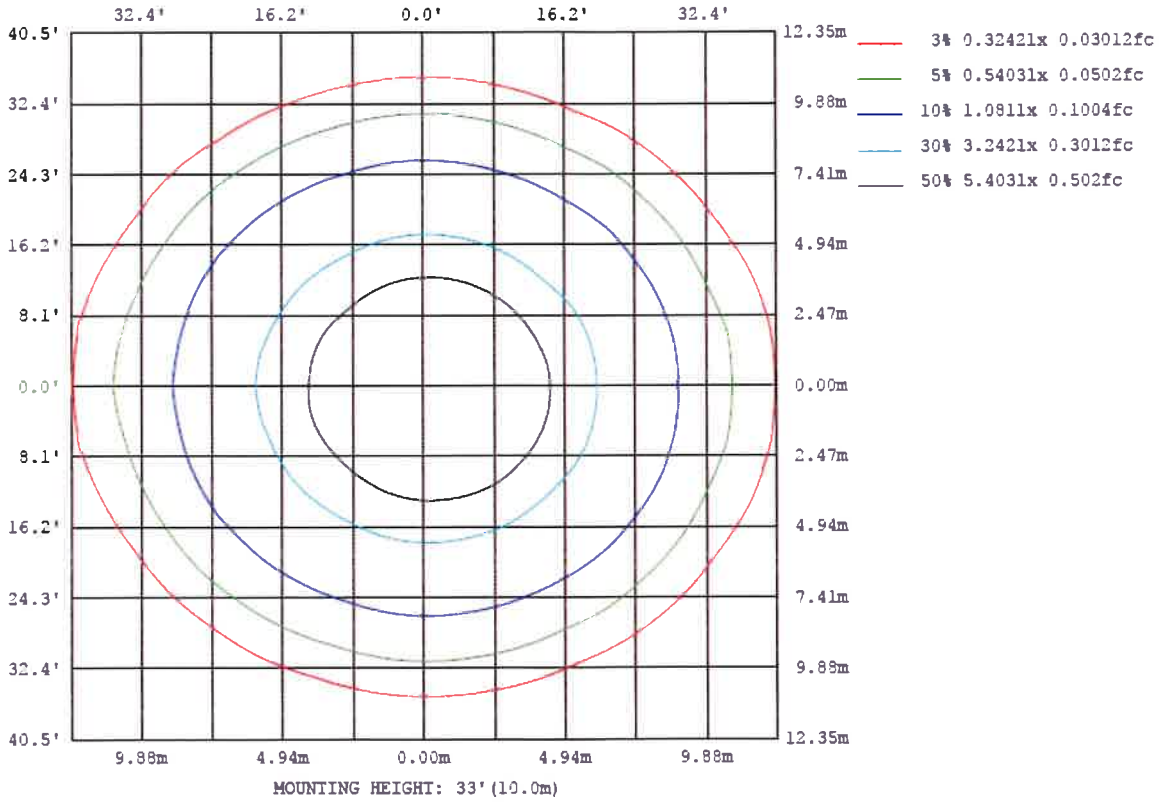
2.1 RGB Fotometrik Deney Sonuçları *(Photometric Test Results of the RGB)*

ISOLUX DIAGRAM



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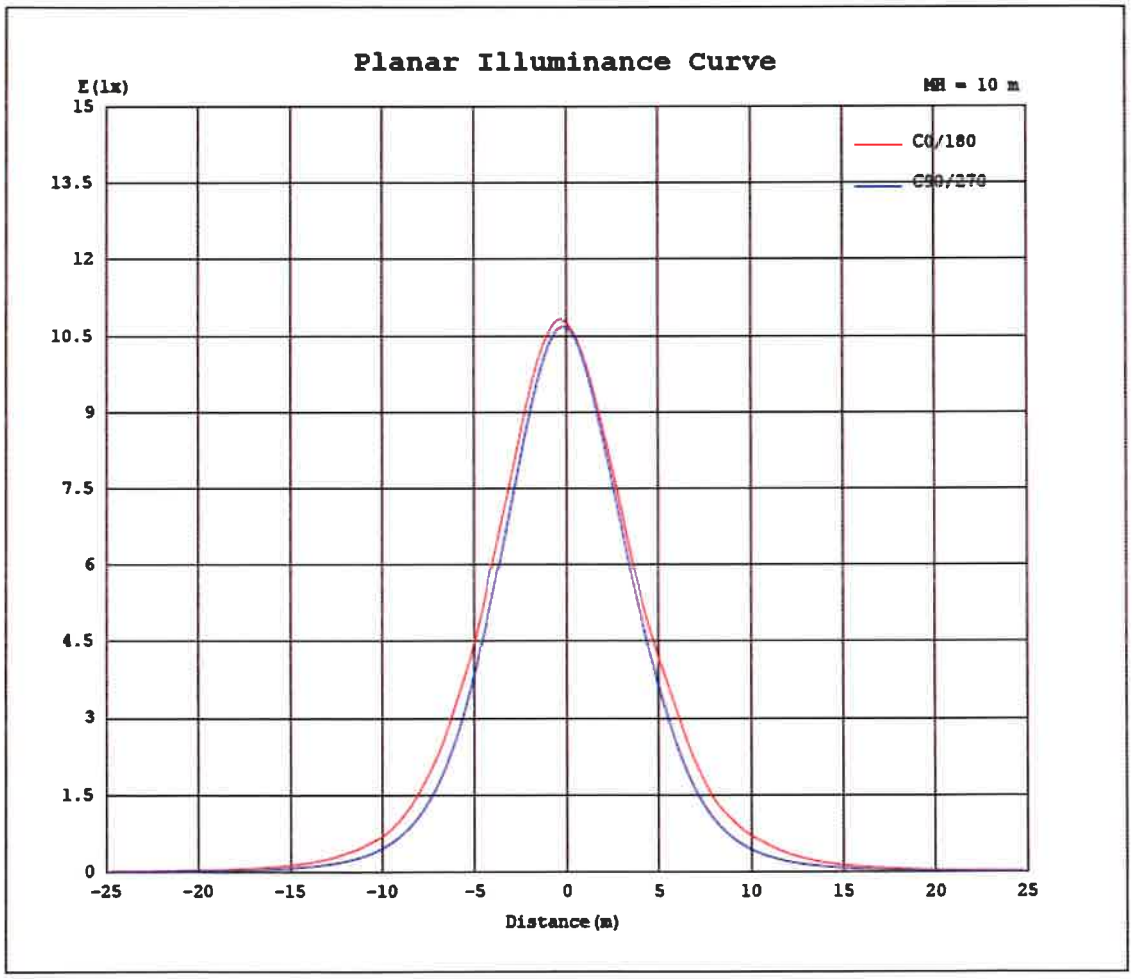
ÖLÇÜM RAPORU
MEASUREMENT REPORT

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



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

Elektriksel Ölçümler
(Electrical Measurements)

Ölçülen Güç (W) *(Input Power)*	46,33 W
Ölçülen Gerilim (V) *(Input Voltage)*	46,83 VDC
Ölçülen Akım (A) *(Input Current)*	0,99 A
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	0,2597
Chrom y	0,1584
Duv	0,0000
Chrom u'	0,2371
Chrom v'	0,3253
Peak	449 nm
Dominant	0 nm
CCT	-
Nominal CCT	-
Ra(CRI)	-
R9	-
S/P Ratio	4,0
Preburning time	1 hr
Test Configuration	4π

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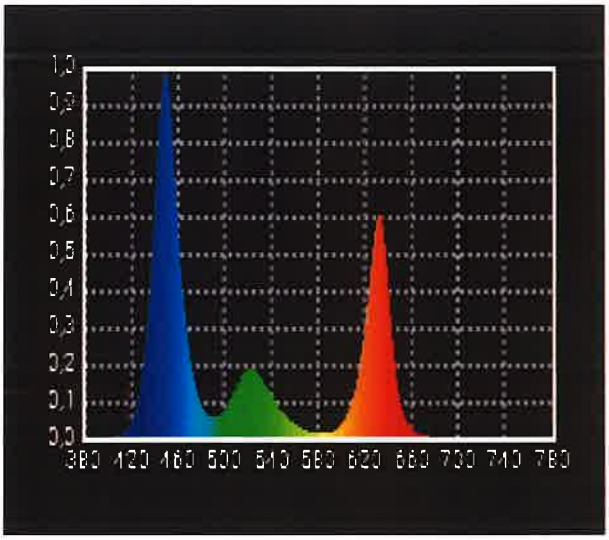
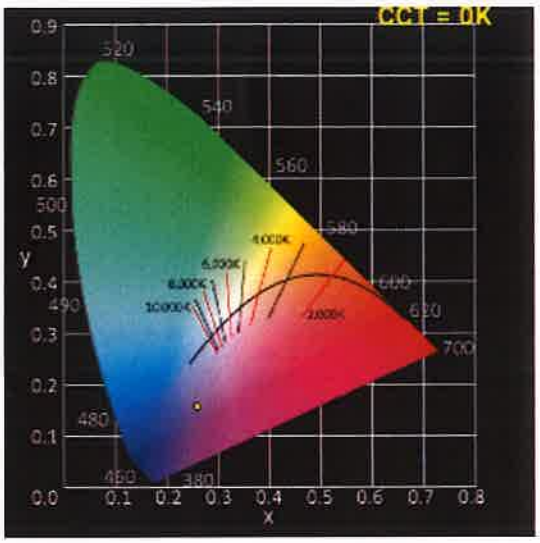
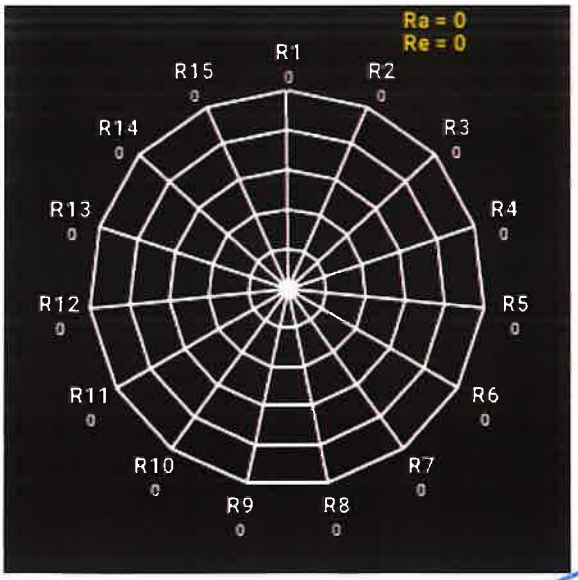
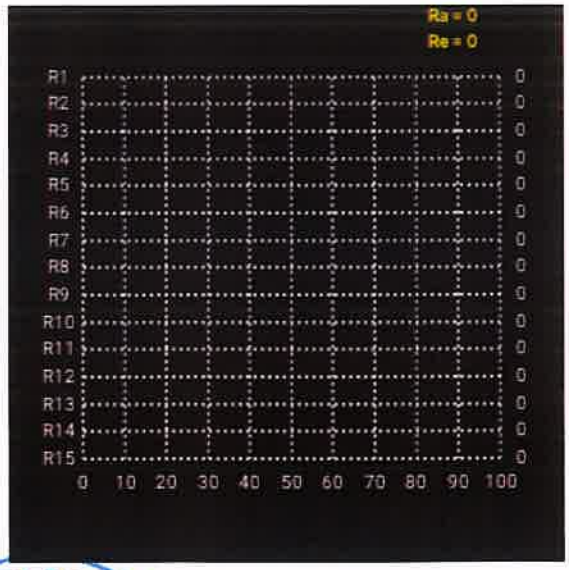
2.2 RGB Spektrokolorimetrik Deney Sonuçları *(spectrocolorimetric Test Results of the RGB)*

Spectral Power Distribution









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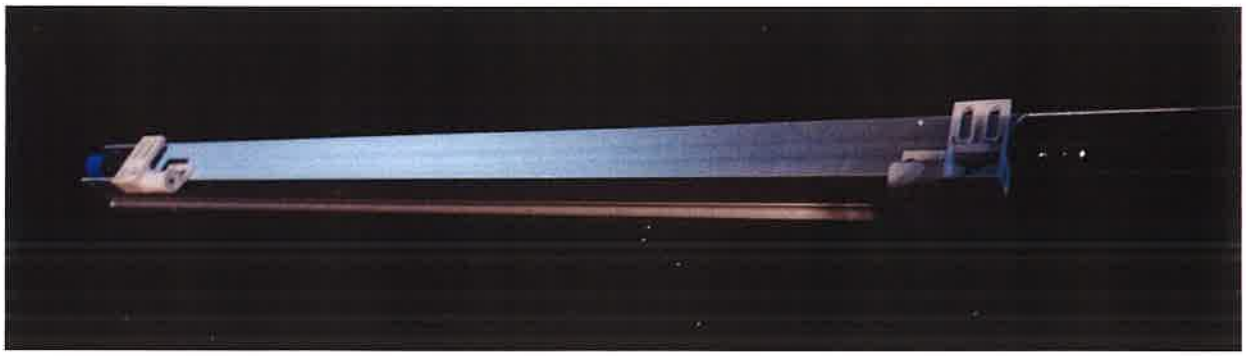
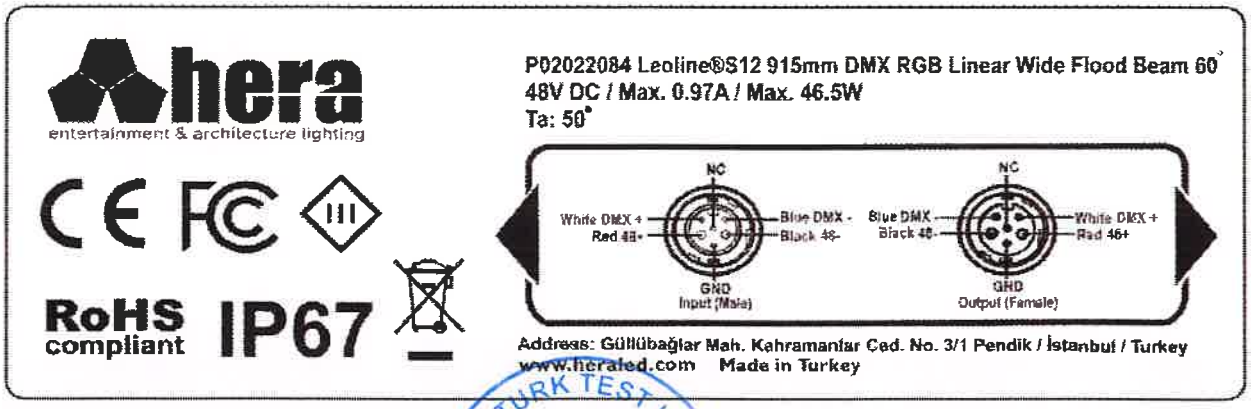
3.1 DGC'nin Fotoğrafları *(Photos of EUT)*





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