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<b>Müşterinin Adı Adresi</b> <i>Customer name/address</i>	: <b>Hera Eğlence ve Mimari Aydınlatma Sistemleri A.Ş</b> Güllübağlar Mah. Kahramanlar Cad. No:3-1 34906 Pendik / İstanbul
<b>İstek Numarası</b> <i>Order No</i>	: 21-IS-0497-IR-002
<b>Numunenin Adı ve Tarifi</b> <i>Name and identity of test item</i>	: Chronopix DW CLEAR - P0102512501501050100
<b>Numunenin kabul tarihi</b> <i>The date of receipt of test item</i>	: <b>17.03.2021</b>
<b>Açıklamalar</b> <i>Remarks</i>	: <b>DGC'ye , IES LM-79-08 standardı uyarınca fotometrik ölçümler yapılmıştır.</b> <i>Photometric measurement has been applied to EUT according to IESNA LM-79-08</i>
<b>Deneyin Yapıldığı Tarih</b> <i>Date of Test</i>	: <b>18.03.2021</b>
<b>Raporun Sayfa Sayısı</b> <i>Number of Pages of the Report</i>	: 16

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

**Seal and Date**  
26.03.2021

**Prepared by**  
Ömer H. KARAKÖSE

**Approved by**  
Mutlu DEMİR



*Ömer H. Karaköse*

*Mutlu Demir*

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1.1

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

<b>Markası / Brand</b>	: HERA
<b>Modeli / Model</b>	: Chronopix DW CLEAR P0102512501501050100
<b>Seri Numarası / Serial Number</b>	: 14100-00001
<b>Beyan Gücü / Rated Power</b>	: 2,4 W
<b>Beyan Gerilimi / Rated Voltage</b>	: 48 V DC
<b>Sembollerin Tanımı / Definitions of Symbols</b>	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)**

Model No	Tip (Type)	Kalibrasyon Tarihi (Calibration Date)	Kontrol (Check Point)
GO-R5000	Goniophotometer	20.10.2019	<input checked="" type="checkbox"/>
WY12010	AC Power Supply	21.10.2019	<input checked="" type="checkbox"/>
PF-2010A	Digital Multimeter	20.10.2019	<input checked="" type="checkbox"/>
D908	Standart Lamp	19.10.2019	<input checked="" type="checkbox"/>
ALP-01	Lighting Passport Spectrometer	25.03.2019	<input checked="" type="checkbox"/>

**1.3 Komponent listesi (Compenent list)**

Komponent (Componenets)	Üretici (Manufacturer)	Model (Model)	Certificate no. (Certificate no.)	Standart no. (Standart No.)
LED Light Source	Cree Inc	SP301-WHITE COLOUR LED	REACH/RoHS	REACH/RoHS
LED Control Unit	Texas Ins.	TLC5971PWPR	REACH/RoHS	REACH/RoHS



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

(Electrical Measurements)

<b>Ölçülen Güç (W)</b> (Input Power)	2.4
<b>Ölçülen Gerilim (V)</b> (Input Voltage)	48
<b>Ölçülen Akım (A)</b> (Input Current)	0.05
<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)	2 hours

**Fotometrik Ölçüm Sonuçları**

(Photometric Measurement Results)

<b>Toplam Işık Akısı</b> (Total Luminous Flux) (lm)	103
<b>Maksimum Işık Şiddeti</b> (Max. Light Intensity) (cd)	37.69
<b>Armatür Etkinliği</b> (Luminaire Efficacy) (lm/W)	42.91
<b>Illuminaire Intensity (lux)</b>	23

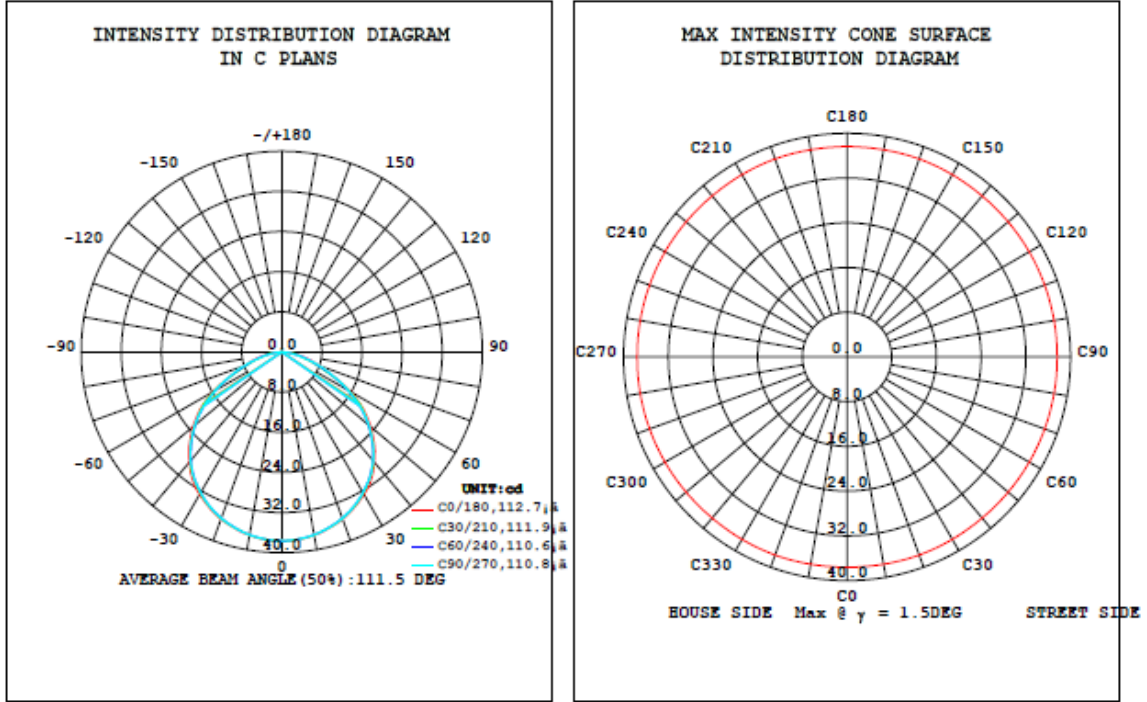


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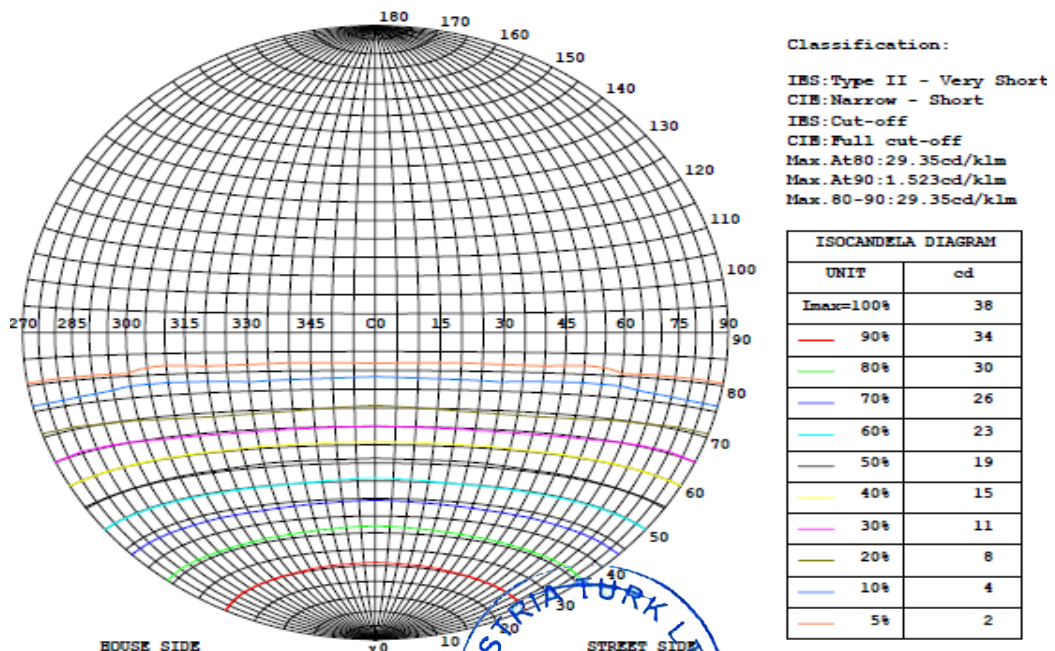
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**2.1 Fotometrik Deney Sonuçları (Photometric Test Results)**



Goniophotometer Measurement Result.



Streetlight Isocandela Diagram



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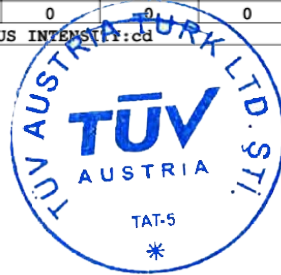
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**2.1 Fotometrik Deney Sonuçları (Photometric Test Results)**

**ZONAL FLUX DIAGRAM**

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
5	37.51	37.46	37.46	37.46	37.51	37.46	37.46	37.46	0- 5	0.8980	0.8980	0.87,0.87
10	37.07	37.01	36.98	37.01	37.07	37.01	36.98	37.01	5- 10	2.664	3.562	3.46,3.46
15	36.35	36.21	36.25	36.21	36.35	36.21	36.25	36.21	10- 15	4.347	7.909	7.68,7.68
20	35.47	35.25	35.24	35.25	35.47	35.25	35.24	35.25	15- 20	5.898	13.81	13.4,13.4
25	34.21	33.95	33.97	33.95	34.21	33.95	33.97	33.95	20- 25	7.270	21.08	20.5,20.5
30	32.79	32.35	32.35	32.35	32.79	32.35	32.35	32.35	25- 30	8.412	29.49	28.6,28.6
35	31.05	30.49	30.59	30.49	31.05	30.49	30.59	30.49	30- 35	9.286	38.77	37.7,37.7
40	28.74	28.34	28.26	28.34	28.74	28.34	28.26	28.34	35- 40	9.852	48.63	47.2,47.2
45	26.12	25.48	25.66	25.48	26.12	25.48	25.66	25.48	40- 45	10.01	58.63	56.9,56.9
50	23.13	22.44	22.66	22.44	23.13	22.44	22.66	22.44	45- 50	9.744	68.38	66.4,66.4
55	19.91	19.19	19.12	19.19	19.91	19.19	19.12	19.19	50- 55	9.113	77.49	75.3,75.3
60	15.81	15.27	15.13	15.27	15.81	15.27	15.13	15.27	55- 60	8.015	85.50	83,83
65	11.31	10.84	11.32	10.84	11.31	10.84	11.32	10.84	60- 65	6.428	91.93	89.3,89.3
70	8.037	6.871	6.819	6.871	8.037	6.871	6.819	6.871	65- 70	4.641	96.57	93.8,93.8
75	5.494	4.818	4.408	4.818	5.494	4.818	4.408	4.818	70- 75	3.122	99.70	96.8,96.8
80	2.898	2.701	2.123	2.701	2.898	2.701	2.123	2.701	75- 80	1.955	101.7	98.7,98.7
85	0.8239	0.7994	0.6915	0.7994	0.8239	0.7994	0.6915	0.7994	80- 85	0.8418	102.5	99.5,99.5
90	0.1401	0.1418	0.1568	0.1418	0.1401	0.1418	0.1568	0.1418	85- 90	0.1752	102.7	99.7,99.7
95	0.1289	0.1839	0.2574	0.1839	0.1289	0.1839	0.2574	0.1839	90- 95	0.0774	102.7	99.8,99.8
100	0.2098	0.2622	0.1210	0.2622	0.2098	0.2622	0.1210	0.2622	95-100	0.1483	102.9	99.9,99.9
105	0	0.0721	0	0.0721	0	0.0721	0	0.0721	100-105	0.0554	102.9	100,100
110	0	0	0.0148	0	0	0	0.0148	0	105-110	0.0080	103.0	100,100
115	0	0	0	0	0	0	0	0	110-115	0.0003	103.0	100,100
120	0	0	0	0	0	0	0	0	115-120	0	103.0	100,100
125	0	0	0	0	0	0	0	0	120-125	0	103.0	100,100
130	0	0	0	0	0	0	0	0	125-130	0	103.0	100,100
135	0	0	0	0	0	0	0	0	130-135	0	103.0	100,100
140	0	0	0	0	0	0	0	0	135-140	0	103.0	100,100
145	0	0	0	0	0	0	0	0	140-145	0	103.0	100,100
150	0	0	0	0	0	0	0	0	145-150	0	103.0	100,100
155	0	0	0	0	0	0	0	0	150-155	0	103.0	100,100
160	0	0	0	0	0	0	0	0	155-160	0	103.0	100,100
165	0	0	0	0	0	0	0	0	160-165	0	103.0	100,100
170	0	0	0	0	0	0	0	0	165-170	0	103.0	100,100
175	0	0	0	0	0	0	0	0	170-175	0	103.0	100,100
180	0	0	0	0	0	0	0	0	175-180	0	103.0	100,100
DEG	LUMINOUS INTENSITY: cd										UNIT: lm	



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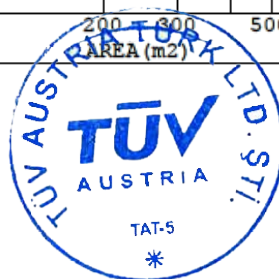
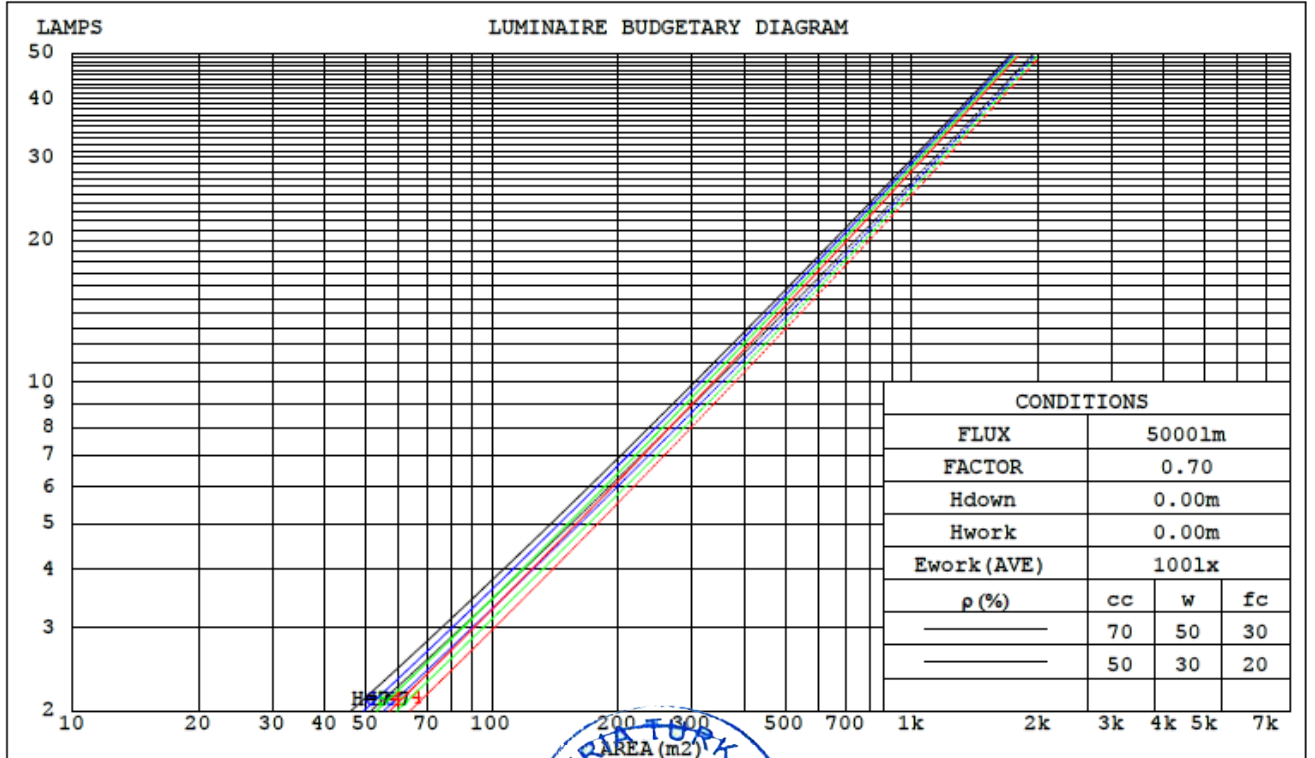
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**2.1 Fotometrik Deney Sonuçları (Photometric Test Results)**

**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	1.12	1.10	1.08	1.10	1.08	1.06	1.06	1.04	1.03	1.02	1.01	.00	.99	.98	.97	.95
2.0	1.06	1.02	.99	1.04	1.01	.98	1.01	.98	.96	.98	.96	.94	.95	.93	.92	.90
3.0	.00	.96	.92	.99	.95	.92	.96	.93	.90	.94	.91	.89	.92	.89	.87	.86
4.0	.95	.90	.87	.94	.90	.86	.92	.88	.85	.90	.87	.84	.88	.86	.83	.82
5.0	.90	.86	.82	.90	.85	.82	.88	.84	.81	.86	.83	.80	.85	.82	.80	.78
6.0	.86	.82	.78	.86	.81	.78	.84	.80	.77	.83	.79	.77	.82	.79	.76	.75
7.0	.83	.78	.74	.82	.77	.74	.81	.77	.74	.80	.76	.73	.79	.76	.73	.72
8.0	.79	.75	.71	.79	.74	.71	.78	.74	.71	.77	.73	.70	.76	.73	.70	.69
9.0	.76	.72	.68	.76	.71	.68	.75	.71	.68	.74	.70	.68	.74	.70	.68	.66
10.0	.74	.69	.66	.73	.69	.66	.72	.68	.65	.72	.68	.65	.71	.68	.65	.64



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**2.1 Fotometrik Deney Sonuçları (Photometric Test Results)**

**WEC AND CCEC**

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pf <sub>c</sub>	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)									
0.0																
1.0	.156	.089	.028	.149	.085	.027	.137	.078	.025	.125	.072	.023	.115	.066	.021	
2.0	.147	.080	.025	.141	.078	.024	.131	.073	.023	.121	.068	.021	.112	.064	.020	
3.0	.138	.073	.022	.133	.071	.022	.125	.068	.021	.117	.064	.020	.109	.060	.019	
4.0	.130	.068	.020	.126	.066	.020	.119	.063	.019	.112	.060	.018	.106	.057	.017	
5.0	.123	.063	.018	.120	.062	.018	.114	.059	.017	.108	.057	.017	.102	.054	.016	
6.0	.117	.059	.017	.114	.058	.017	.109	.056	.016	.103	.054	.016	.098	.052	.015	
7.0	.111	.055	.016	.109	.054	.015	.104	.053	.015	.099	.051	.015	.095	.049	.015	
8.0	.106	.052	.015	.104	.051	.014	.100	.050	.014	.096	.048	.014	.092	.047	.014	
9.0	.102	.049	.014	.100	.049	.014	.096	.047	.013	.092	.046	.013	.089	.045	.013	
10.0	.098	.047	.013	.096	.046	.013	.092	.045	.013	.089	.044	.013	.086	.043	.012	

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pf <sub>c</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	.170	.158	.147	.145	.135	.126	.099	.093	.087	.057	.054	.051	.018	.017	.016	
2.0	.153	.133	.116	.131	.114	.100	.090	.079	.070	.052	.046	.041	.017	.015	.013	
3.0	.139	.113	.093	.119	.098	.081	.082	.068	.057	.047	.040	.033	.015	.013	.011	
4.0	.128	.098	.076	.109	.085	.066	.075	.059	.047	.044	.035	.028	.014	.011	.009	
5.0	.118	.086	.063	.101	.075	.055	.070	.052	.039	.040	.031	.023	.013	.010	.008	
6.0	.110	.077	.053	.094	.066	.046	.065	.046	.033	.038	.027	.019	.012	.009	.006	
7.0	.102	.069	.045	.088	.060	.039	.061	.042	.028	.035	.025	.017	.011	.008	.005	
8.0	.096	.062	.039	.083	.054	.034	.057	.038	.024	.033	.022	.014	.011	.007	.005	
9.0	.091	.057	.034	.078	.049	.029	.054	.035	.021	.032	.020	.012	.010	.007	.004	
10.0	.086	.052	.030	.074	.045	.026	.051	.033	.018	.030	.019	.011	.010	.006	.004	



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**2.1 Fotometrik Deney Sonuçları (Photometric Test Results)**

**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	8.0	8.8	8.3	9.0	9.1	6.3	7.1	6.5	7.2	7.4
3H	8.1	8.8	8.4	9.0	9.2	6.3	7.0	6.5	7.2	7.4
4H	8.1	8.8	8.4	9.0	9.2	6.2	6.9	6.5	7.1	7.4
6H	8.0	8.7	8.3	8.9	9.2	6.2	6.8	6.5	7.1	7.3
8H	8.0	8.6	8.3	8.9	9.1	6.1	6.8	6.4	7.0	7.3
12H	8.0	8.6	8.3	8.8	9.1	6.1	6.7	6.4	6.9	7.2
4H 2H	7.9	8.6	8.2	8.8	9.0	6.3	6.9	6.5	7.2	7.4
3H	8.0	8.6	8.3	8.9	9.2	6.3	6.9	6.6	7.1	7.4
4H	8.0	8.6	8.4	8.9	9.2	6.2	6.8	6.6	7.1	7.4
6H	8.0	8.5	8.3	8.8	9.1	6.2	6.6	6.5	7.0	7.3
8H	7.9	8.4	8.3	8.7	9.1	6.1	6.6	6.5	6.9	7.3
12H	7.9	8.3	8.3	8.7	9.1	6.1	6.5	6.5	6.8	7.2
8H 4H	7.9	8.3	8.3	8.7	9.1	6.1	6.6	6.5	6.9	7.3
6H	7.9	8.2	8.3	8.6	9.0	6.1	6.4	6.5	6.8	7.2
8H	7.8	8.1	8.3	8.6	9.0	6.0	6.3	6.5	6.8	7.2
12H	7.8	8.0	8.2	8.5	8.9	6.0	6.2	6.4	6.7	7.2
12H 4H	7.8	8.3	8.3	8.6	9.0	6.1	6.5	6.5	6.9	7.3
6H	7.8	8.1	8.2	8.5	9.0	6.0	6.3	6.5	6.8	7.2
8H	7.8	8.0	8.2	8.5	8.9	6.0	6.2	6.4	6.7	7.2
Variations with the observer position at spacings:										
S = 1.0H	+ 2.5 / - 3.4					+ 2.2 / - 4.0				
1.5H	+ 3.8 / - 2.9					+ 3.4 / - 3.1				
2.0H	+ 3.6 / - 2.7					+ 3.4 / - 2.8				



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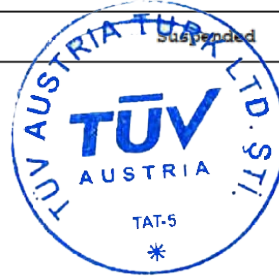
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**2.1 Fotometrik Deney Sonuçları (Photometric Test Results)**

**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) $k(RI) \times RCR = 5$									
$k = 0.60$	88	82	78	88	82	78	87	81	78	75
0.80	96	90	86	95	89	86	94	89	86	82
1.00	100	94	91	99	94	91	97	94	90	86
1.25	104	99	95	103	98	95	101	97	94	90
1.50	106	102	98	105	101	98	103	100	97	93
2.00	109	105	102	107	104	101	105	102	99	94
2.50	110	107	104	109	106	103	106	103	101	95
3.00	112	109	106	110	107	105	107	105	103	96
4.00	114	111	109	112	110	108	108	107	105	98
5.00	115	113	111	113	111	110	109	108	107	99
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004										
SHRNOM = 1.25										

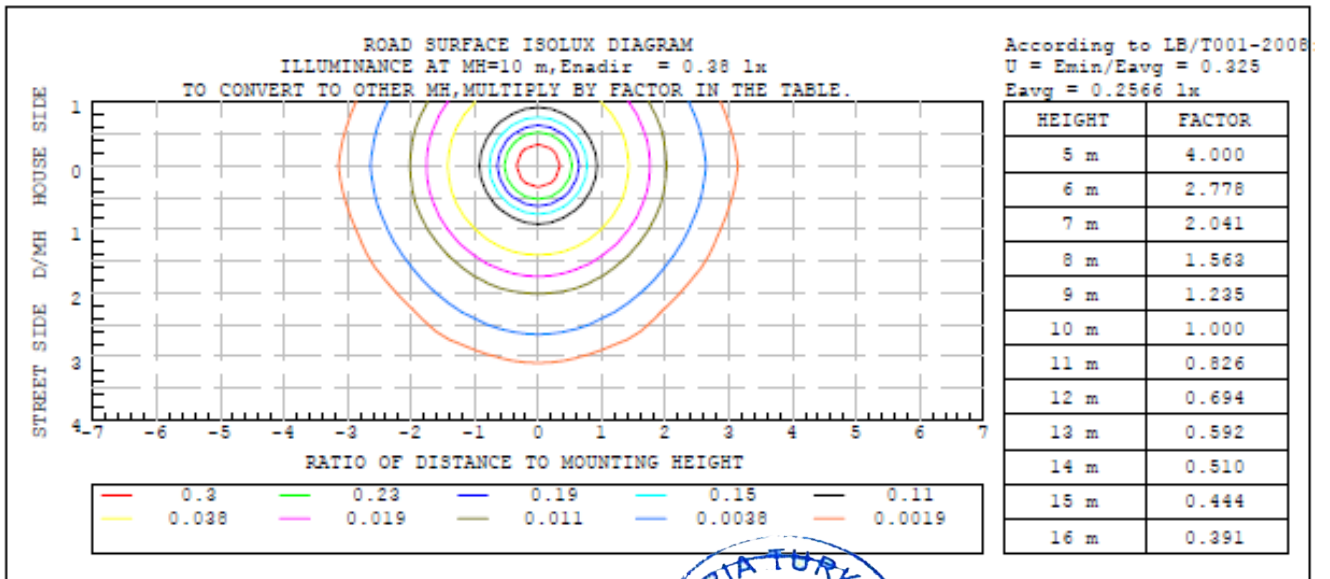
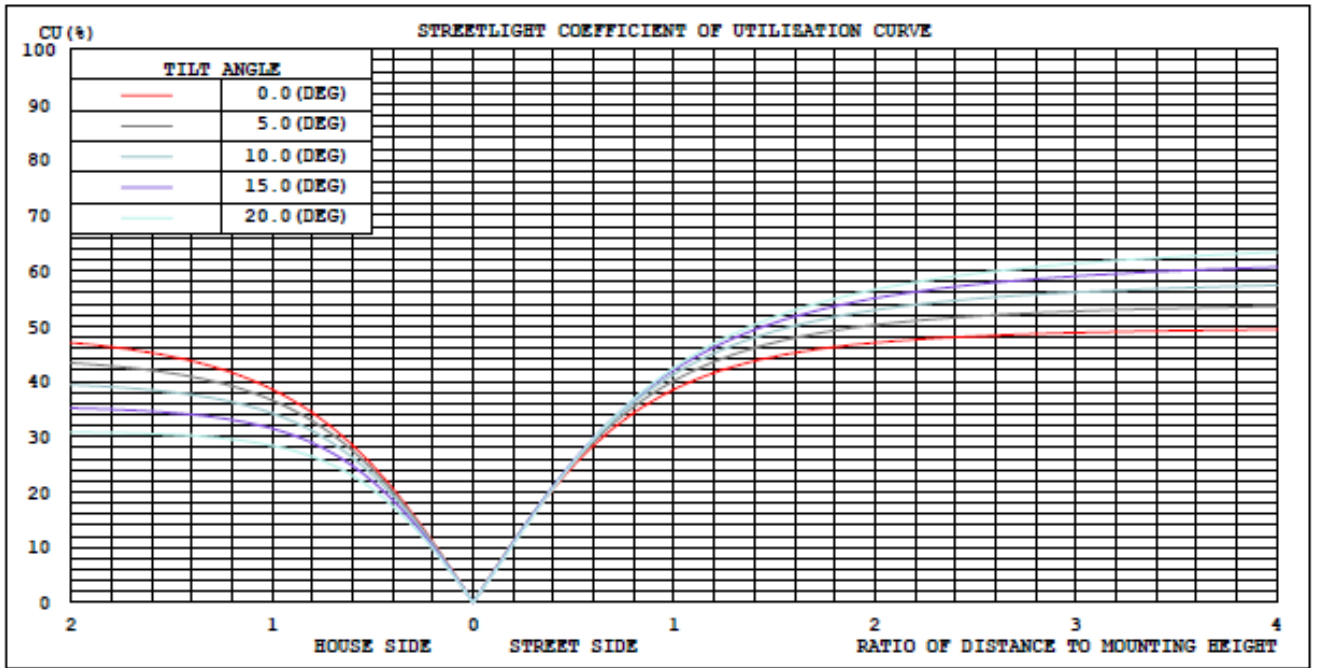


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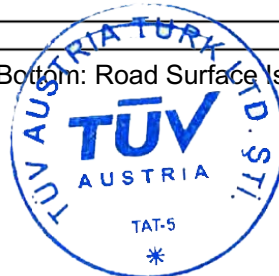
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**2.1 Fotometrik Deney Sonuçları (Photometric Test Results)**



Streetlight Coefficient of Utilization Curve, Bottom: Road Surface Isolux Diagram

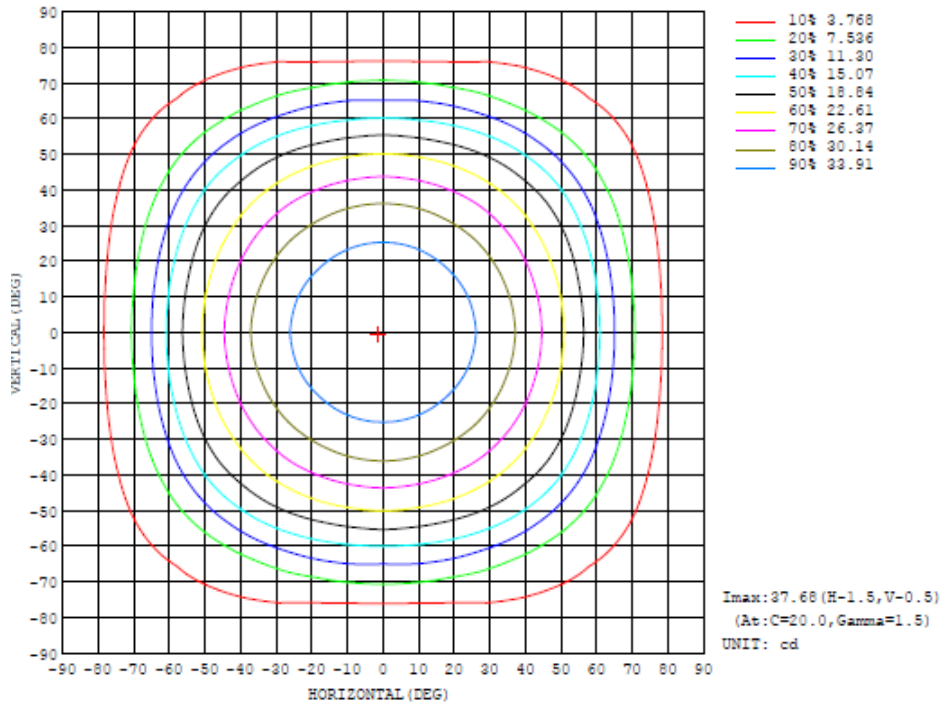


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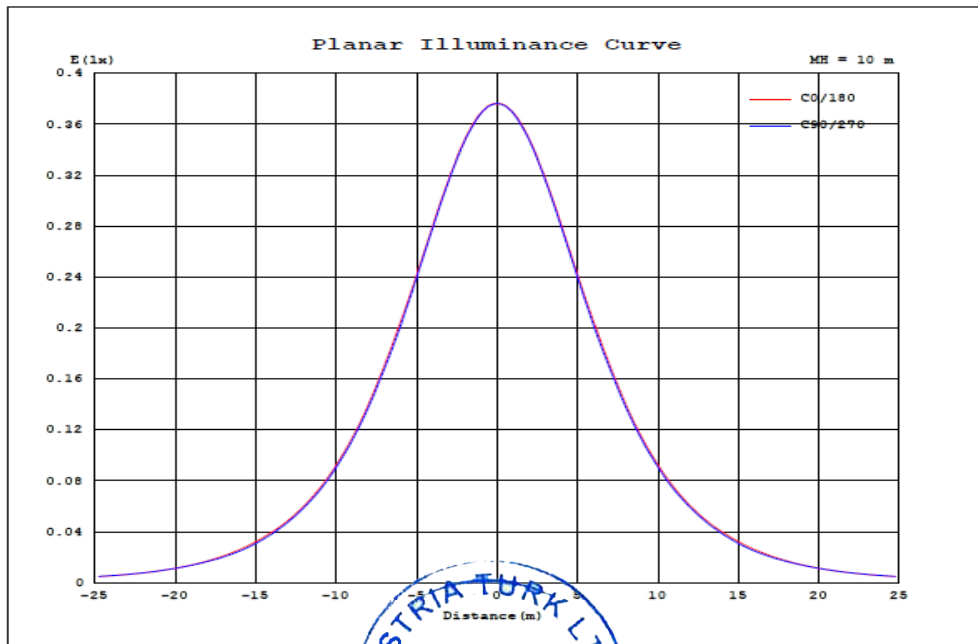
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**2.1 Fotometrik Deney Sonuçları (Photometric Test Results)**



Isocandela Diagram



Planar Illuminance Curve



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

(Electrical Measurements)

<b>Ölçülen Güç (W)</b> (Input Power)	2.4
<b>Ölçülen Gerilim (V)</b> (Input Voltage)	48
<b>Ölçülen Akım (A)</b> (Input Current)	0.05
<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)	2 hours

**Spektrokolorimetrik Ölçüm Sonuçları**

(Spectrocolorimetric Measurement Results)

<b>Chrom x</b>	0.3645
<b>Chrom y</b>	0.3535
<b>Duv</b>	-0.0063
<b>Chrom u'</b>	0.2238
<b>Chrom v'</b>	0.4885
<b>Peak</b>	451 nm
<b>Dominant</b>	583 nm
<b>CCT</b>	4313 K
<b>Nominal CCT</b>	4000 K
<b>Ra(CRI)</b>	80
<b>R9</b>	15
<b>S/P Ratio</b>	1.7
<b>Preburning time</b>	2 hr
<b>Test Configuration</b>	Hand-type spectrocolorimeter



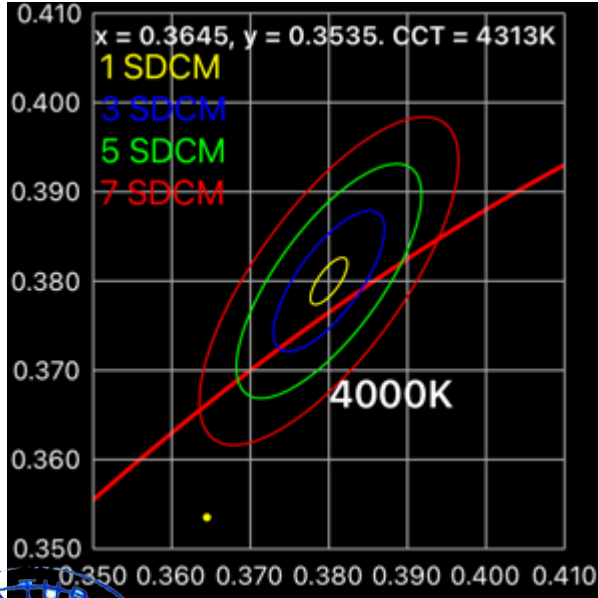
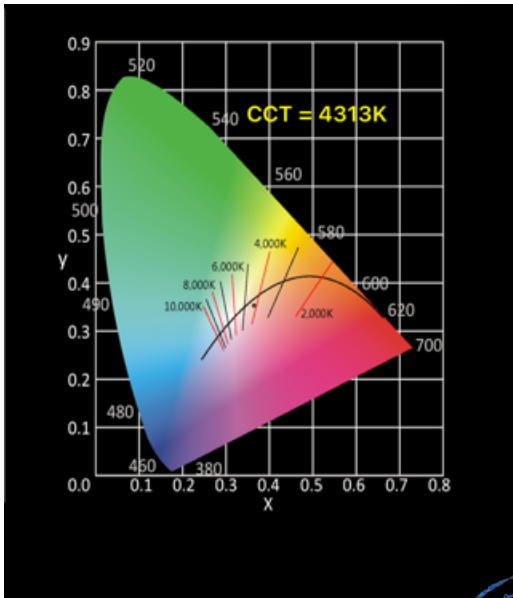
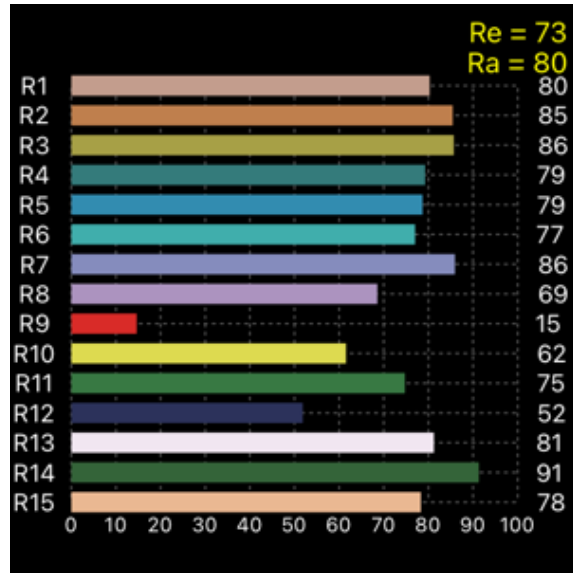
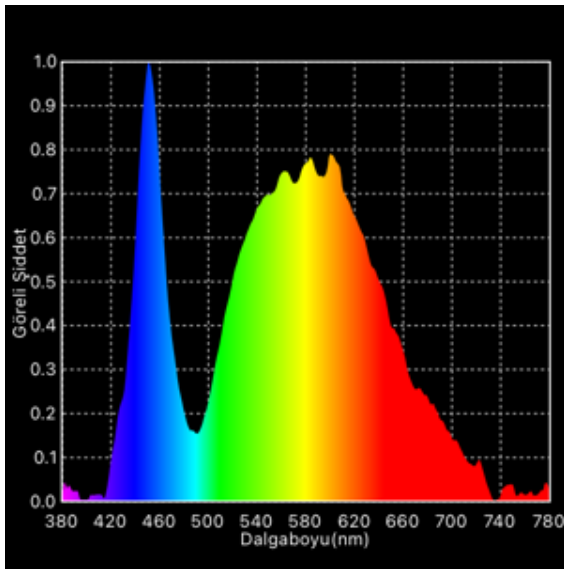
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2.2 Spektrokolorimetrik Deney Sonuçları (spectrocolorimetric Test Results)

Spectral Power Distribution



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

