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ÖLÇÜM RAPORU
MEASUREMENT REPORT

TL-806

19-TST-0095-
140

07-19

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

: PD60S-RGBW-4CH.DMX DIRECT VIEW PIXEL DOT

Numunenin kabul tarihi
The date of receipt of test item

: 01.07.2019

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

: 10.07.2019

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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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

Saltuk Buğra GÜNEŞ

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

: PD60S-RGBW-4CH.DMX DIRECT VIEW PIXEL DOT

Seri Numarası / Serial Number

: Test Numunesi
Test Sample

Beyan Gücü / Rated Power

: 4.32 W

Beyan Gerilimi / Rated Voltage

: 48 VDC

Sembollerin Tanımı / Definitions of Symbols

DGC= Deneyden Geçen Cihaz
EUT=Equipment Under Test



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

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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	☒
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	Integrating sphere	28.05.2018	28.05.2020	☒

1.3 Komponent listesi (Component list)

Komponent (Components)	Üretici (Manufacturer)	Model (Model)	Teknik Data (Technical Data)	Standart no. (Standart No.)
LED	Cree Inc	CLQ6A	Led-RGBW, IF= 100 mA, VF= 2.1 V, 3 V, 3.1 V, 2.9 V	Cree® LED Lamp, Reliability Test Standard (JEITA ED-4701 100, 105, MIL-STD-202G, JEITA ED-4701 200 201, JEITA ED-4701 100 103, JEITA ED-4701 200 202,
PCB	Odak Baskılı Devre San. Ve Tic. Ltd.Şti.	C13091_R1.1	2 Layer 1.6mm FR4 Black Solder Mask/White Silk Screen/Gold Plating/35+35umCu	UL 796, IPC, RoHs



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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON

Elektriksel Ölçümler

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	4,32
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,09
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 Luminous Flux) (lm)	162,35
Maksimum Işık Şiddeti (Max. Light Intensity) (cd)	68,71
Armatür Etkinliği (Luminaire Efficacy) (lm/W)	37,58



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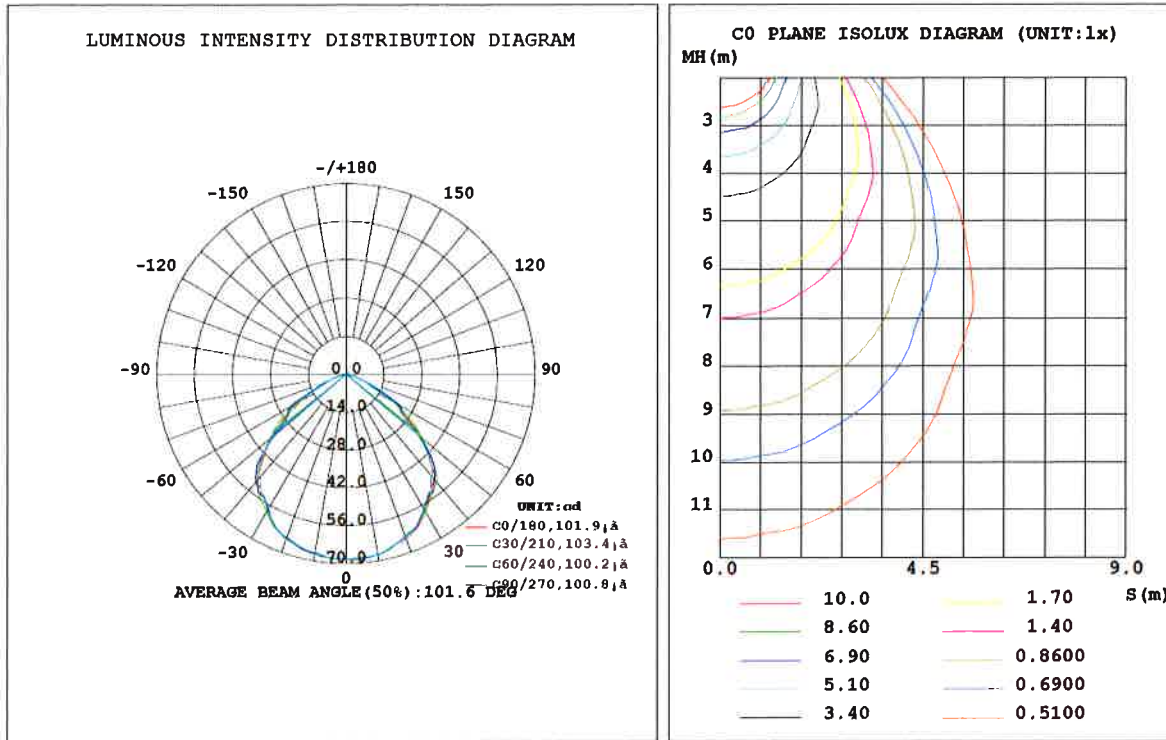
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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON



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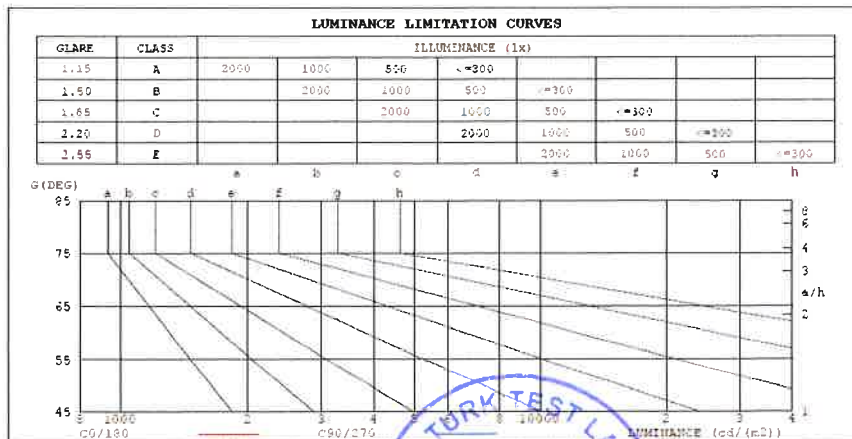
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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON

**ZONAL FLUX DIAGRAM
AND LUMINANCE LIMITATION CURVES**

ZONAL FLUX DIAGRAM:

Y	C0	C45	C90	C135	C180	C225	C270	C315	Y	Zone	Φ total	lum, lamp
5	67.94	68.24	67.90	68.12	68.44	68.27	67.86	67.82	0- 5	1.628	1.628	1.1
10	67.67	67.59	67.63	67.47	67.64	67.62	67.62	67.22	5- 10	4.846	6.474	3.55, 3.99
15	66.00	66.28	66.30	65.75	66.04	65.78	65.77	65.92	10- 15	7.914	14.39	8.85, 8.86
20	64.71	64.70	64.57	63.82	64.48	63.71	64.17	64.16	15- 20	10.72	25.10	15.5, 15.5
25	62.24	62.11	62.04	61.72	62.31	61.81	61.62	61.45	20- 25	13.23	38.33	23.6, 23.6
30	57.85	58.17	58.09	57.68	58.69	58.00	57.41	57.12	25- 30	15.16	53.48	32.9, 32.9
35	54.08	54.64	53.72	54.30	54.03	54.50	53.29	54.25	30- 35	16.42	69.91	43.1, 43.1
40	50.96	51.30	49.43	51.48	50.63	51.34	49.03	50.63	35- 40	17.58	87.49	53.9, 53.9
45	43.09	43.55	44.05	44.23	43.84	43.68	42.98	42.76	40- 45	17.77	105.3	64.8, 64.8
50	35.52	35.41	35.71	35.20	36.20	34.84	34.44	34.57	45- 50	16.16	121.4	74.8, 74.8
55	27.41	28.06	26.03	29.76	27.66	28.79	24.91	27.99	50- 55	13.46	134.9	83.1, 83.1
60	19.35	19.35	21.81	19.18	20.03	18.86	20.04	17.27	55- 60	11.21	146.1	90.90
65	12.10	14.65	10.66	15.09	11.34	13.89	10.06	14.06	60- 65	8.101	154.2	95.95
70	4.713	5.584	8.790	5.995	6.304	5.439	6.271	4.920	65- 70	4.822	159.0	97.9, 97.9
75	1.584	2.387	2.836	2.828	2.154	2.231	1.963	2.080	70- 75	2.252	161.3	99.3, 99.3
80	0.7101	0.7857	0.8841	0.9452	0.8532	0.8520	0.8395	0.8000	75- 80	0.7336	162.0	99.8, 99.8
85	0.1696	0.2059	0.2542	0.2889	0.2282	0.2379	0.2199	0.2263	80- 85	0.3062	162.3	100, 100
90	0	0	0	0	0	0	0	0	85- 90	0.0441	162.3	100, 100
95	0	0	0	0	0	0	0	0	90- 95	0.0008	162.3	100, 100
100	0	0	0	0	0	0	0	0	95- 100	0	162.3	100, 100
105	0	0	0	0	0	0	0	0	100- 105	0	162.3	100, 100
110	0	0	0	0	0	0	0	0	105- 110	0	162.3	100, 100
115	0	0	0	0	0	0	0	0	110- 115	0	162.3	100, 100
120	0	0	0	0	0	0	0	0	115- 120	0	162.3	100, 100
125	0	0	0	0	0	0	0	0	120- 125	0	162.3	100, 100
130	0	0	0	0	0	0	0	0	125- 130	0	162.3	100, 100
135	0	0	0	0	0	0	0	0	130- 135	0	162.3	100, 100
140	0	0	0	0	0	0	0	0	135- 140	0	162.3	100, 100
145	0	0	0	0	0	0	0	0	140- 145	0	162.3	100, 100
150	0	0	0	0	0	0	0	0	145- 150	0	162.3	100, 100
155	0	0	0	0	0	0	0	0	150- 155	0	162.3	100, 100
160	0	0	0	0	0	0	0	0	155- 160	0	162.3	100, 100
165	0	0	0	0	0	0	0	0	160- 165	0	162.3	100, 100
170	0	0	0	0	0	0	0	0	165- 170	0	162.3	100, 100
175	0	0	0	0	0	0	0	0	170- 175	0	162.3	100, 100
180	0	0	0	0	0	0	0	0	175- 180	0	162.3	100, 100
DEG	LUMINOUS INTENSITY: cd									UNIT: lm		



LUMINANCE cd/ (m2)		
G (DEG)	C0/130	C90/270
85	19	29
80	41	51
75	61	110
70	138	257
65	286	252
60	387	436
55	478	454
50	553	556
45	609	623

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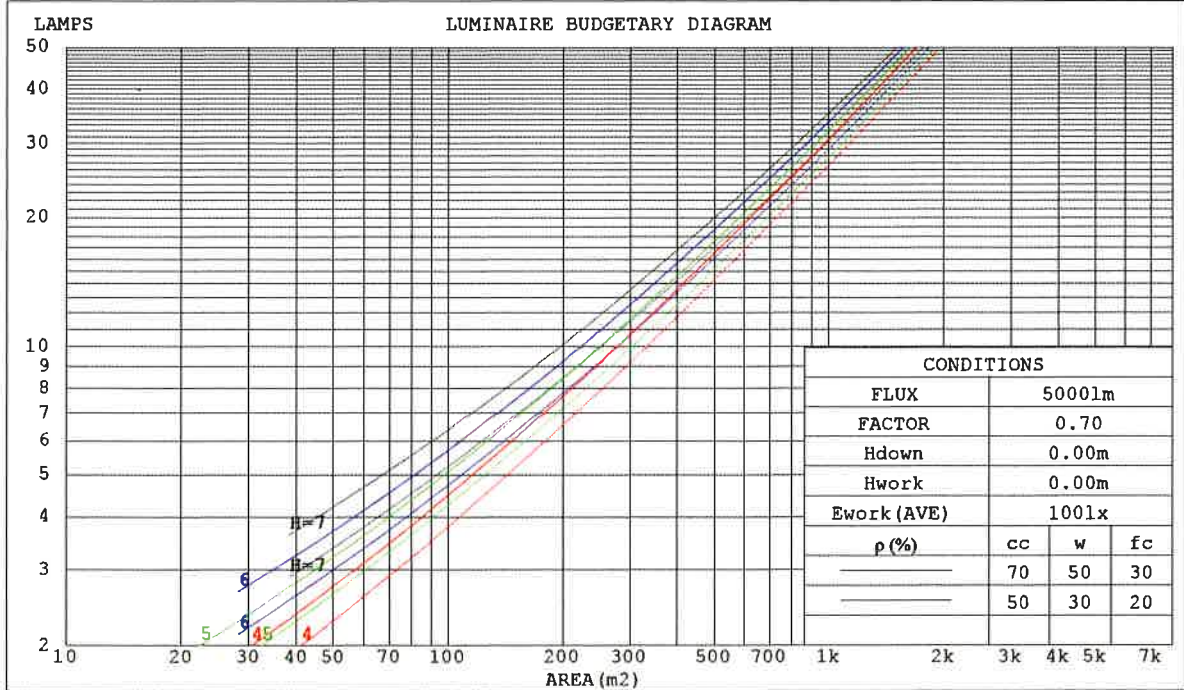
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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON)

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

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 _c	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	1.07	1.03	1.00	1.05	1.01	.99	1.00	.98	.95	.97	.94	.93	.93	.91	.90	.88
2.0	.95	.89	.84	.93	.88	.83	.90	.85	.81	.87	.83	.80	.84	.81	.78	.76
3.0	.85	.77	.72	.83	.76	.71	.80	.75	.70	.78	.73	.69	.75	.71	.68	.66
4.0	.76	.68	.62	.74	.67	.61	.72	.66	.61	.70	.64	.60	.68	.63	.59	.57
5.0	.68	.60	.54	.67	.59	.54	.65	.58	.53	.63	.57	.52	.61	.56	.52	.50
6.0	.62	.53	.47	.61	.53	.47	.59	.52	.47	.57	.51	.46	.56	.50	.46	.44
7.0	.56	.48	.42	.55	.47	.42	.54	.47	.42	.52	.46	.41	.51	.45	.41	.39
8.0	.51	.43	.38	.51	.43	.38	.49	.42	.37	.48	.42	.37	.47	.41	.37	.35
9.0	.47	.39	.34	.47	.39	.34	.45	.39	.34	.44	.38	.34	.43	.38	.33	.32
10.0	.44	.36	.31	.43	.36	.31	.42	.35	.31	.41	.35	.31	.40	.35	.30	.29



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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON 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 Coefficients(WEC)											
0.0																		
1.0	.253	.144	.046	.246	.140	.045	.233	.134	.043	.221	.128	.041	.210	.122	.039			
2.0	.248	.136	.042	.242	.133	.041	.231	.128	.040	.220	.124	.039	.211	.119	.038			
3.0	.236	.126	.038	.231	.124	.037	.221	.120	.036	.212	.116	.036	.203	.113	.035			
4.0	.223	.116	.034	.218	.114	.034	.210	.111	.033	.201	.108	.033	.194	.105	.032			
5.0	.210	.107	.031	.206	.106	.031	.198	.103	.030	.190	.100	.030	.184	.098	.029			
6.0	.197	.099	.028	.193	.098	.028	.186	.096	.028	.180	.093	.027	.174	.092	.027			
7.0	.185	.092	.026	.182	.091	.026	.176	.089	.026	.170	.087	.025	.165	.085	.025			
8.0	.175	.085	.024	.172	.085	.024	.166	.083	.024	.161	.081	.024	.156	.080	.023			
9.0	.165	.080	.022	.162	.079	.022	.157	.078	.022	.152	.076	.022	.148	.075	.022			
10.0	.156	.075	.021	.153	.074	.021	.149	.073	.021	.145	.072	.020	.141	.071	.020			

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	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	.176	.157	.139	.151	.134	.120	.103	.092	.083	.059	.054	.048	.019	.017	.016	
2.0	.166	.132	.103	.143	.114	.089	.098	.079	.062	.056	.046	.037	.018	.015	.012	
3.0	.158	.114	.079	.135	.098	.069	.093	.068	.048	.054	.040	.028	.017	.013	.009	
4.0	.150	.100	.062	.129	.087	.054	.089	.060	.038	.051	.035	.023	.017	.012	.007	
5.0	.143	.090	.050	.123	.078	.044	.085	.054	.031	.049	.032	.018	.016	.010	.006	
6.0	.137	.081	.042	.117	.070	.036	.081	.049	.026	.047	.029	.015	.015	.009	.005	
7.0	.130	.074	.035	.112	.064	.031	.077	.045	.022	.045	.027	.013	.015	.009	.004	
8.0	.124	.069	.030	.107	.059	.026	.074	.042	.019	.043	.025	.011	.014	.008	.004	
9.0	.119	.064	.026	.102	.055	.023	.071	.039	.016	.041	.023	.010	.013	.008	.003	
10.0	.114	.059	.023	.098	.052	.020	.068	.036	.014	.040	.021	.009	.013	.007	.003	



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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON

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	10.2	11.6	10.4	11.8	12.0	10.3	11.7	10.5	11.9	12.1
3H	10.5	11.8	10.8	12.0	12.2	10.7	12.0	11.0	12.2	12.5
4H	10.4	11.7	10.8	11.9	12.1	10.7	11.9	11.0	12.2	12.4
6H	10.4	11.5	10.7	11.8	12.0	10.7	11.8	11.0	12.0	12.3
8H	10.3	11.4	10.6	11.7	12.0	10.6	11.7	11.0	12.0	12.3
12H	10.3	11.3	10.6	11.6	11.9	10.6	11.6	10.9	11.9	12.2
4H 2H	10.5	11.7	10.8	11.9	12.1	10.5	11.7	10.8	12.0	12.2
3H	10.8	11.9	11.2	12.2	12.5	11.1	12.1	11.4	12.4	12.7
4H	10.8	11.7	11.2	12.1	12.4	11.1	12.0	11.5	12.3	12.7
6H	10.7	11.6	11.1	11.9	12.3	11.0	11.9	11.4	12.2	12.6
8H	10.7	11.5	11.1	11.8	12.2	11.0	11.8	11.4	12.1	12.5
12H	10.7	11.4	11.1	11.7	12.1	11.0	11.7	11.4	12.0	12.4
8H 4H	10.7	11.5	11.1	11.9	12.2	11.0	11.8	11.4	12.1	12.5
6H	10.7	11.3	11.1	11.7	12.1	11.0	11.6	11.4	12.0	12.4
8H	10.7	11.2	11.1	11.6	12.1	10.9	11.5	11.4	11.9	12.4
12H	10.6	11.1	11.1	11.5	12.0	10.9	11.4	11.4	11.8	12.3
12H 4H	10.7	11.4	11.1	11.8	12.2	11.0	11.7	11.4	12.0	12.4
6H	10.7	11.2	11.1	11.6	12.1	10.9	11.5	11.4	11.9	12.4
8H	10.6	11.1	11.1	11.5	12.0	10.9	11.4	11.4	11.8	12.3
Variations with the observer position at spacings:										
S = 1.0H	+ 0.8 / - 1.0					+ 0.5 / - 0.8				
1.5H	+ 0.5 / - 0.5					+ 0.5 / - 0.8				
2.0H	+ 1.0 / - 1.3					+ 0.9 / - 1.1				

CIE Pub.117 Corrected 162.3 lm Total Lamp Luminous Flux.(8log(F/F0) = -6.3)



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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON

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) $k(RI) \times RCR = 5$									
$k = 0.60$	62	52	45	62	51	45	60	51	45	39
0.80	73	62	56	72	62	56	70	61	55	49
1.00	82	72	65	80	71	65	78	72	65	58
1.25	89	80	73	87	79	73	85	77	72	66
1.50	93	85	79	92	84	78	89	82	77	71
2.00	99	92	87	98	91	86	95	89	85	78
2.50	103	96	91	101	95	90	97	92	88	81
3.00	106	100	95	104	98	94	100	96	92	84
4.00	109	104	100	107	102	99	103	99	96	88
5.00	111	107	104	108	105	102	104	101	99	90
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			



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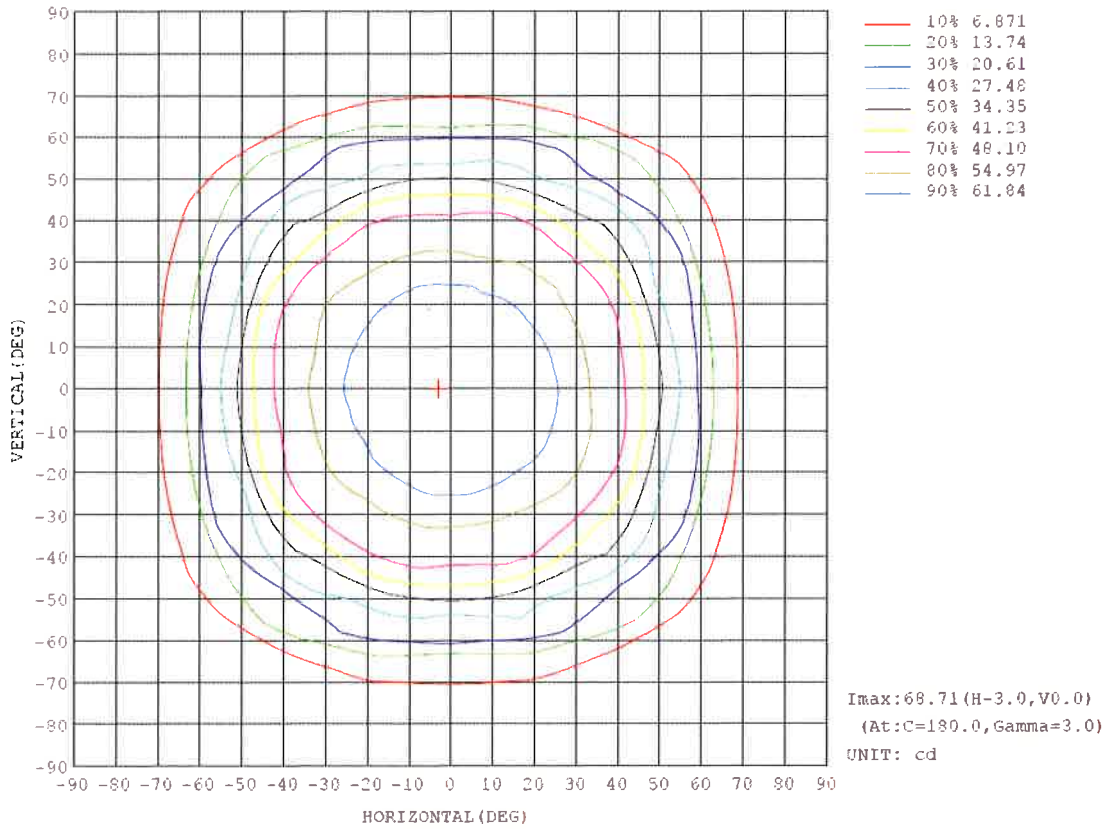
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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON ISOCANDELA DIAGRAM)



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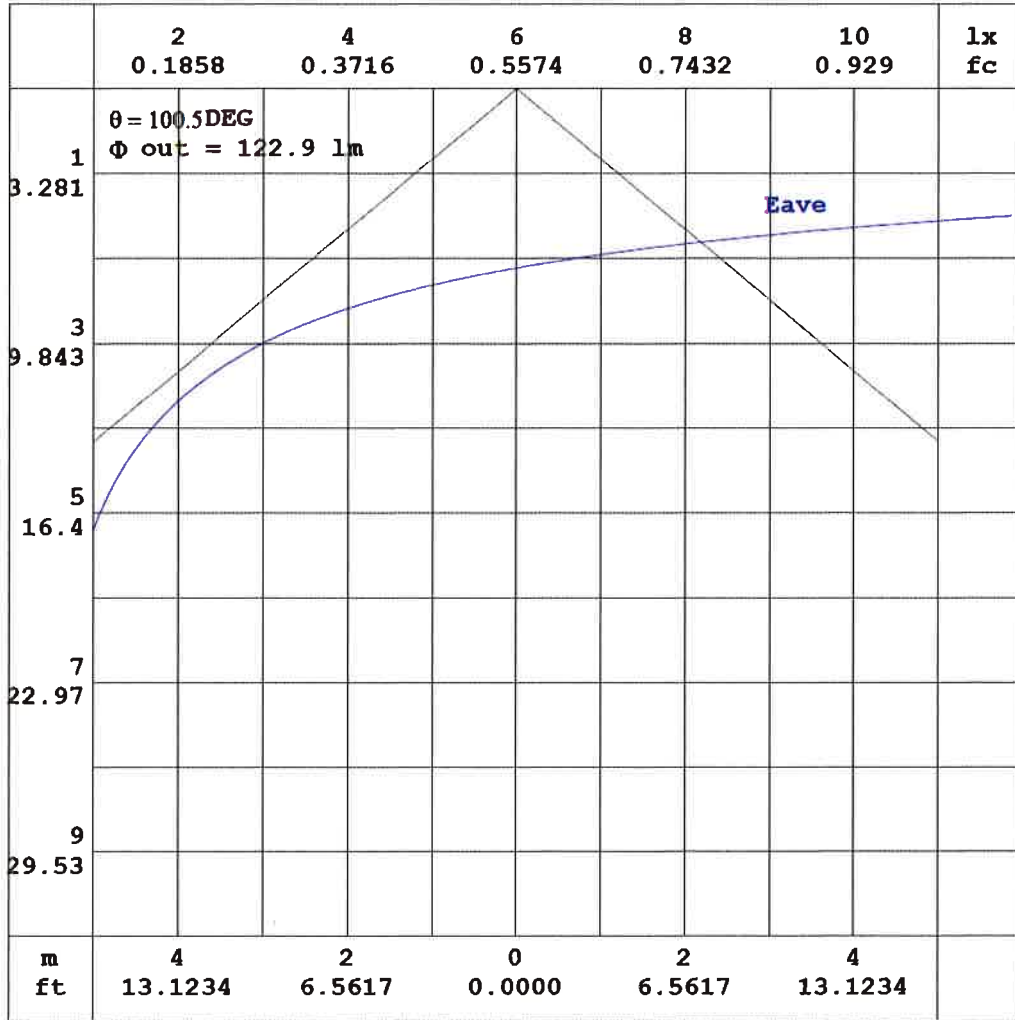
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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON**AAI CURVES**

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



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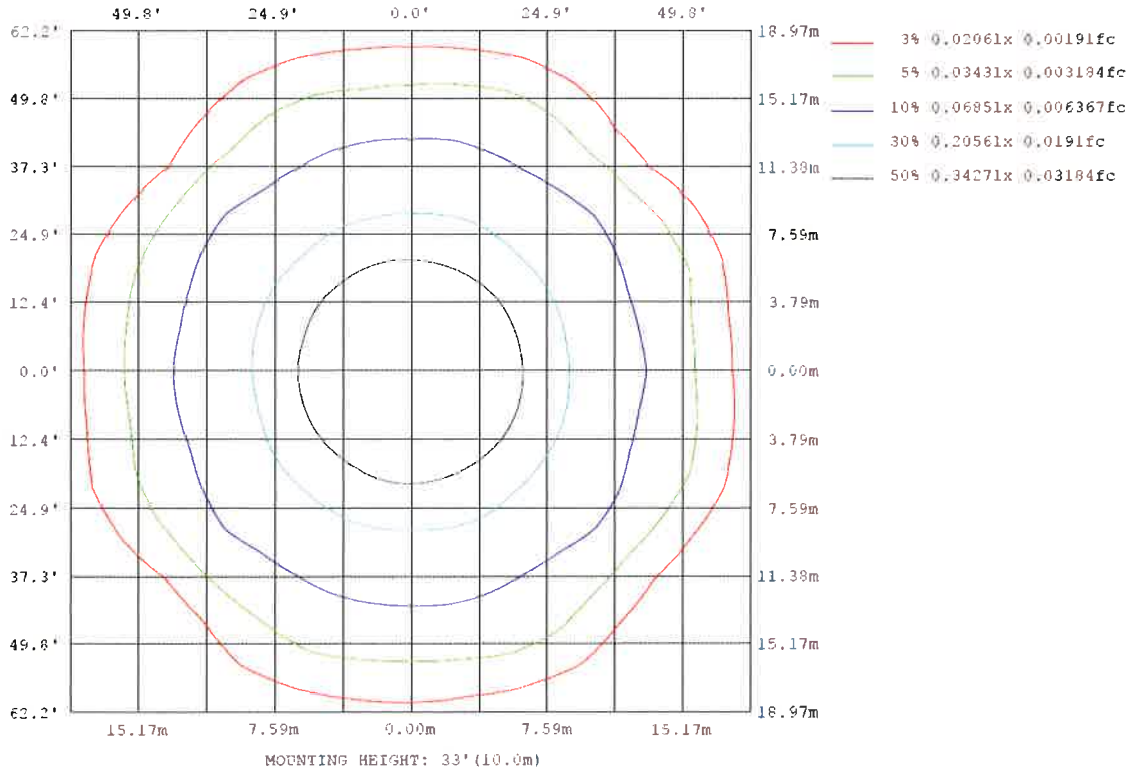
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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON

ISOLUX DIAGRAM



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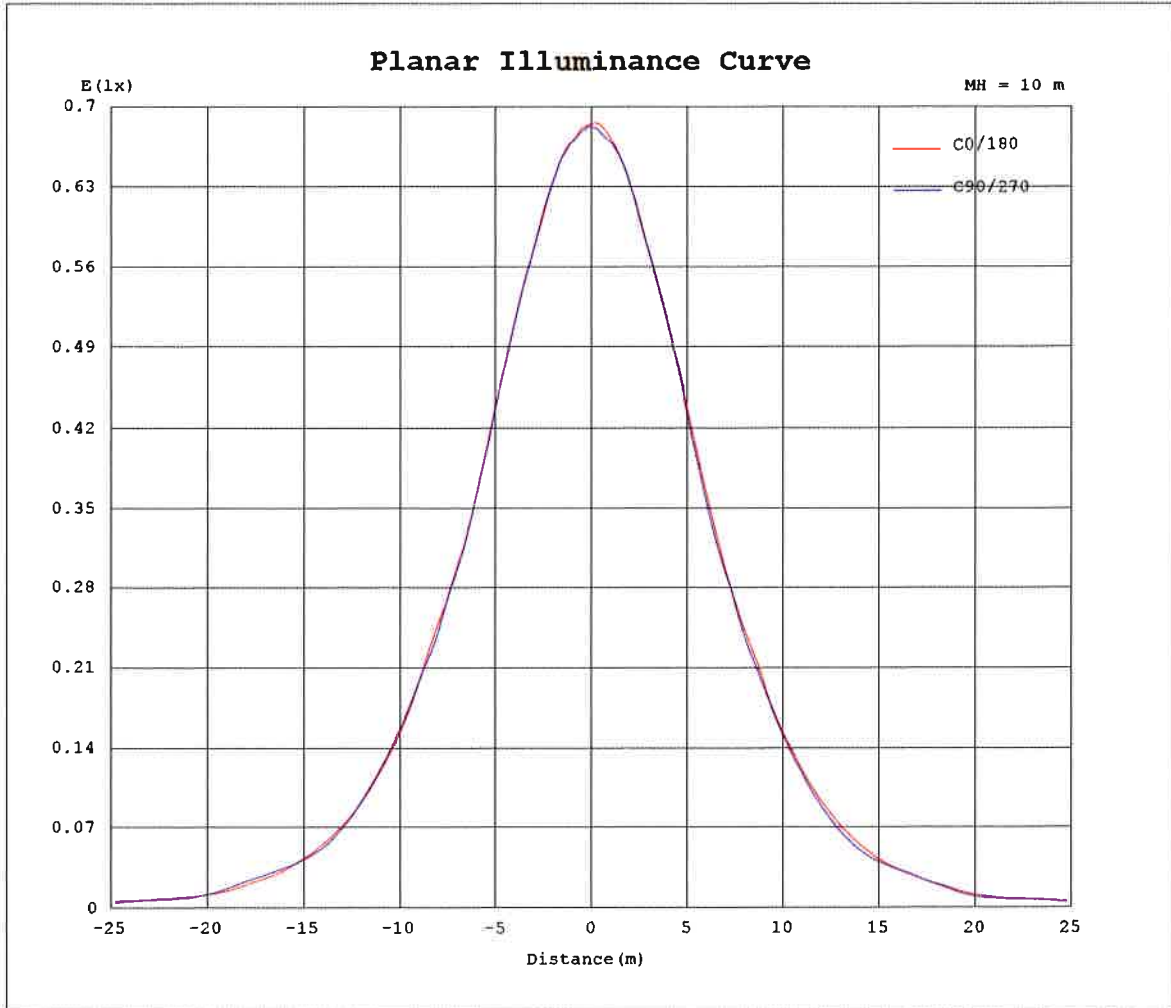
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2.1 RGBW FULL ON Fotometrik Deney Sonuçları (Photometric Test Results of the RGBW FULL ON



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2.2

RGBW FULL ON Spektrokolorimetrik Deney Sonuçları (spectrocolorimetric Test Results of the RGBW FULL ON)

Elektriksel Ölçümler

(Electrical Measurements)

Ölçülen Güç (W) (Input Power)	4,32
Ölçülen Gerilim (V) (Input Voltage)	48 VDC
Ölçülen Akım (A) (Input Current)	0,09
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	0,2620
Chrom y	0,3025
Duv	0,0186
Chrom u'	0,1716
Chrom v'	0,4459
Peak	466 nm
Dominant	486 nm
CCT	11206 K
Nominal CCT	-K
Ra(CRI)	83
R9	-9
S/P Ratio	3,3
Preburning time	1 hr
Test Configuration	4π



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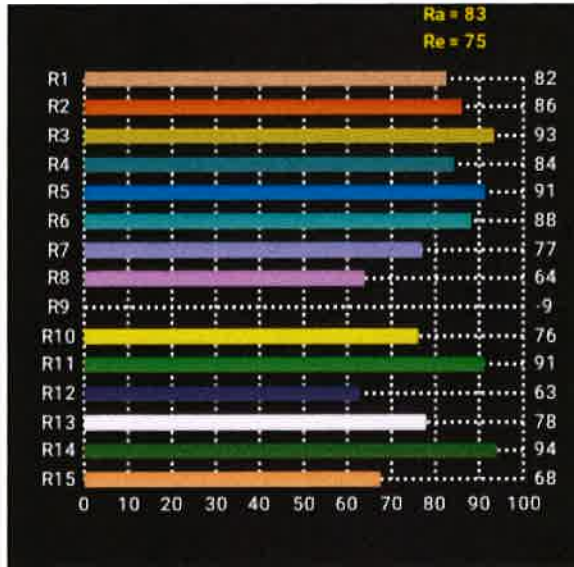
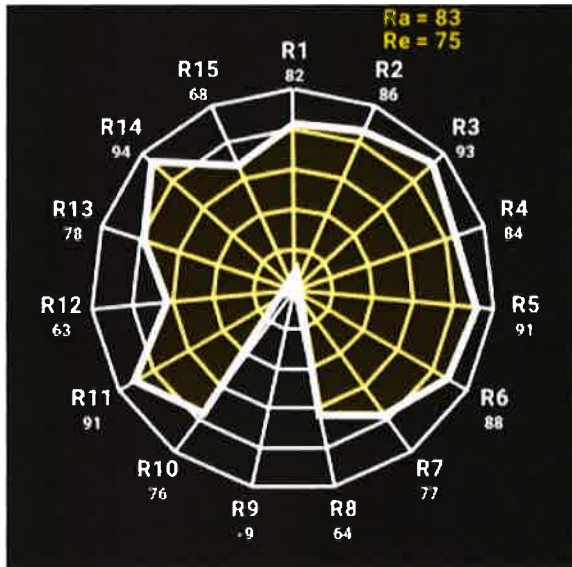
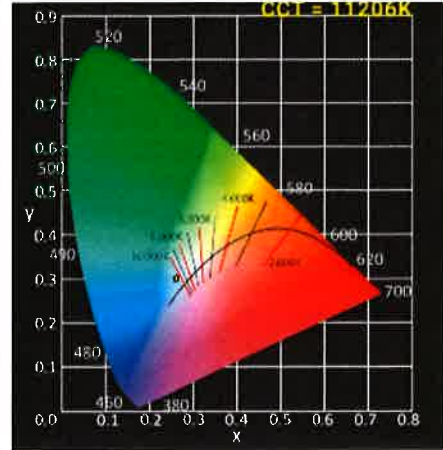
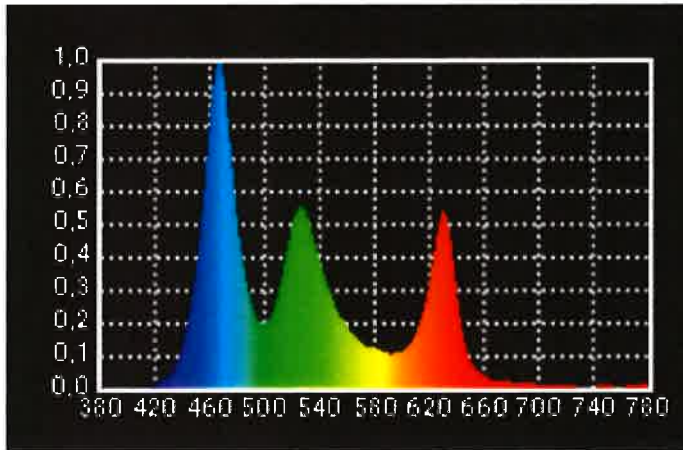
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2.2

RGBW FULL ON Spektrokolorimetrik Deney Sonuçları (spectrocolorimetric Test Results of the RGBW FULL ON)

Spectral Power Distribution



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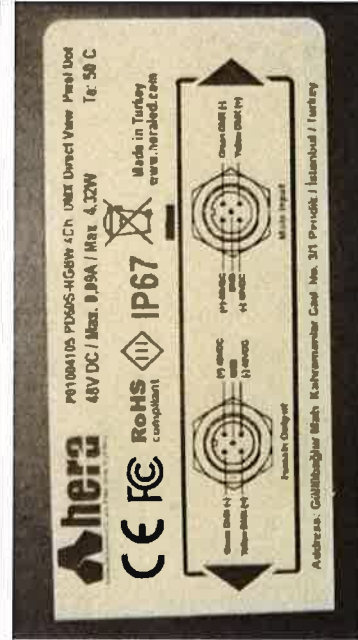
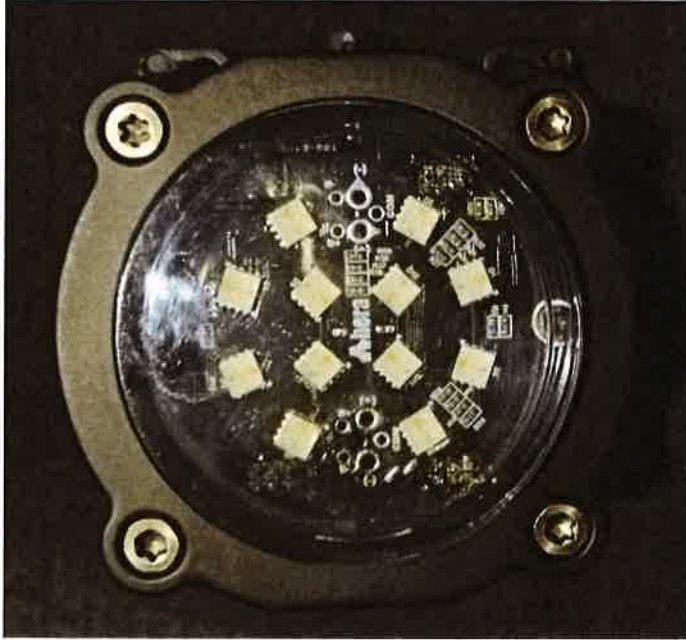
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3.1 DGC'nin Fotoğrafları (Photos of EUT)



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