

Ölçüm Sonuçları ve Analiz Raporu  
(Measurement Results and Analysis Report)

AB-1115-T

00861-1

12.11.2019

MÜŞTERİNİN ADI / ADRESİ (CUSTOMER NAME/ADDRESS)	Ali Alanya Elektrik Elektronik Aydınlatma Sanayi Ve Ticaret Limited Şirketi Organize Sanayi Bölgesi 16.Cadde No:12 Merkez/Karaman Tel: 0338 217 18 42
TALEP/RAPOR NO (ORDER/REPORT NO)	861-1
NUMUNENİN KABUL TARİHİ (THE DATE OF RECEIPT OF TEST ITEM)	07.11.2019
ÖLÇÜMÜN YAPILDIĞI TARİH (DATE OF TEST)	07.11.2019
NUMUNENİN ADI VE TARİFİ (NAME AND IDENTITY OF TEST ITEM)	PROJEKTÖR FORTE-2/FTR1506566BL
UYGULANAN STANDART/METOD (APPLIED STANDARD/METHOD)	TS EN 13032-1:2004 + A1:2012 Light and Lighting :Measurement and Presentation of Photometric Data of Lamps and Luminaires-Part1: Measurement and File. IES-LM-79-08 Approved Method : Electrical and Photometric Measurements of Solid-State Lighting Products
RAPORUN SAYFA SAYISI (NUMBER OF PAGES OF THE REPORT)	19
AÇIKLAMALAR (EXPLANATIONS)	Gonyofotometre ve Spektroradyometre sonuçlarını içerir.

Deney laboratuvarı olarak faaliyet gösteren EVATEG Optik Laboratuvarı, TÜRKAK'TAN AB- 1115-T akreditasyon numarası ile TS EN 13032-1:2004+A1:2012 ve IES-LM-79-08 standardına göre akredite edilmiştir. (EVATEG Optical Laboratory accredited by TÜRKAK under registration number AB-1115-T for TS EN 13032-1:2004+A1:2012 and IES-LM-79-08 as test laboratory.)

Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır. (Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test report.)

Mühür  
(Seal)

Tarih  
(Date)

Ölçüm Sorumlusu  
(Person in charge of measurement)

Onaylayan  
(Approval)

Songül Evren

Prof. Dr. Mehmet ARIK

Sonuçlar sadece yukarıda tanımlanan numune için geçerlidir. Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz raporlar geçersizdir. (Results are only valid for the sample which is defined above. This report shall not be reproduced other than in full except with the permission of the laboratory. Testing reports without signature and seal are not valid.) 6-R.001-Rev:9

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LABORATUVAR BİLGİSİ (LABORATORY INFORMATION)

ADRES (ADDRESS)	Özyeğin Üniversitesi Çekmeköy Kampüsü Nişantepe Mah. Orman Sok. 34794 Çekmeköy – İSTANBUL
ÇEVRE ŞARTLARI (ENVIRONMENTAL CONDITIONS)	25 °C ± 1, %40RH ± %10 Laboratuvarımıza kabul edilen ürünün 25°C'de +/- 1 sapmayla ve bağıl nemi %45'de ± %10 sapma ile ortam şartlarında standartlara uygun olarak ölçümü tamamlanmıştır.

NUMUNE BİLGİLERİ (SAMPLE INFORMATION)

TANIMI (DESCRIPTION)	PROJEKTÖR
MODELİ/KODU (MODEL/CODE)	FORTE-2/FRT1506566BL
BEYAN GÜCÜ (RATED POWER)	150W
ÇALIŞMA GERİLİMİ (RATED VOLTAGE)	220-240VAC
ÇALIŞMA FREKANSI (RATED FREQUENCY)	50/60Hz
ÇALIŞMA AKIMI (RATED CURRENT)	0,6A
IŞIK KAYNAĞI TİPİ / MARKASI (LIGHT SOURCE TYPE / MARK)	LED/NICHIA
IŞIK KAYNAĞI AÇIKLAMASI (LIGHT SOURCE DESCRIPTION)	Yarıiletken (LED)
IŞIK KAYNAĞI SAYISI (NUMBER OF SOURCE)	320 adet
BALAST/LED SÜRÜCÜ BİLGİLERİ (BALAST/LED DRIVER INFORMATION)	Philips Xitanium 150W
DUY TİPİ (LAMP-HOLDER TYPE)	-
ATEŞLEYİCİ BİLGİLERİ (IGNITOR INFORMATION)	-

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DENEY EKİPMANLARI (TEST EQUIPMENTS)

GONIOPHOTOMETER (GONYOFOTOMETRE) (LMT / GO 1920-V)					
Cihaz Kodu	Cihaz Adı	Cihazın Markası	Cihazın Modeli	Son Kal.Tarihi	Gelecek Kal.Tarihi
ED014	Digital Power Meter	Yokogawa	WT310	11.03.2019	11.03.2021
ED015	Programmable AC Source	Chroma	6415	06.03.2019	06.03.2021
ED016	Fotometre Başlığı	LMT	06B3072	12.03.2019	12.03.2021
ED017	Eğim Ölçer	Nclinometer	IP 65	15.04.2019	15.04.2021
ED018	Goniometer-Control-Unit	LMT	-	-	-
ED019	Photometer Unit	LMT	-	-	-
ED020	Çizgi Lazer	Bosch	GCL 2-50 C	-	-
ED037	Hava İstasyonu	PCE Instruments	PCE-FWS 20	-	12.03.2021

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ÖLÇÜM SONUÇLARI (MEASUREMENT RESULTS)

KARARLI HAL SÜRESİ (STEADY STATE TIME)	120 dk
ORTALAMA GERİLİM (AVERAGE VOLTAGE) (V)	220
FREKANS (FREQUENCY) (HZ)	50
AKTİF GÜÇ (ACTIVE POWER) (W)	127.7
ORTALAMA AKIM (AVERAGE CURRENT) (MA)	585
GÜÇ FAKTÖRÜ (POWER FACTOR) (PF)	0.990
IŞIK AKISI (LUMINOUS FLUX) (LM)	17805
VERİMLİLİK (EFFICIENCY) (LM/W)	139
MERKEZİ YOĞUNLUK (0,0) (CENTRAL INTENSTY) (CD)	6530
RENKSEL GERİVERİM İNDEKSİ (COLOR RENDERING INDEX) (CRI)	6697
RENK SICAKLIĞI (COLORATED COLOR TEMPERATURE) (CCT) (K)	74

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DENEYE İLİŞKİN GRAFİKLER VE TABLOLAR (GRAPHICS AND TABLES RELATED TO EXPERIMENT)

RADYOMETRİ DİYAGRAMLARI

(RADIOMETRY DIAGRAMS)

Parameter	Scan
Date/Time	08-11-19 9:31
Radiant Flux (Watts)	5.79E+01
Scotopic Luminous Flux (lm')	3.84E+04
Chromaticity x coord	0.3098
Chromaticity y coord	0.325
Chromaticity u coord	0.1973
Chromaticity v coord	0.3105
Delta uv	0.0019
Chromaticity u' coord	0.1973
Chromaticity v' coord	0.4657
Peak Wavelength (nm)	453.4
Center Wavelength (nm)	452.5
Centroid Wavelength (nm)	539
Dominant Wavelength (nm)	487
Full Width Half Max Bandwidth (nm)	19.9
Excitation Purity (%)	8.6
Correlated Color Temperature (deg. K)	6697
SDCM	6.5 F 6500
Correlation	0.0054
Correlation Coefficient	0.000560558
Color Rendering Index Average (RA)	74.15451201

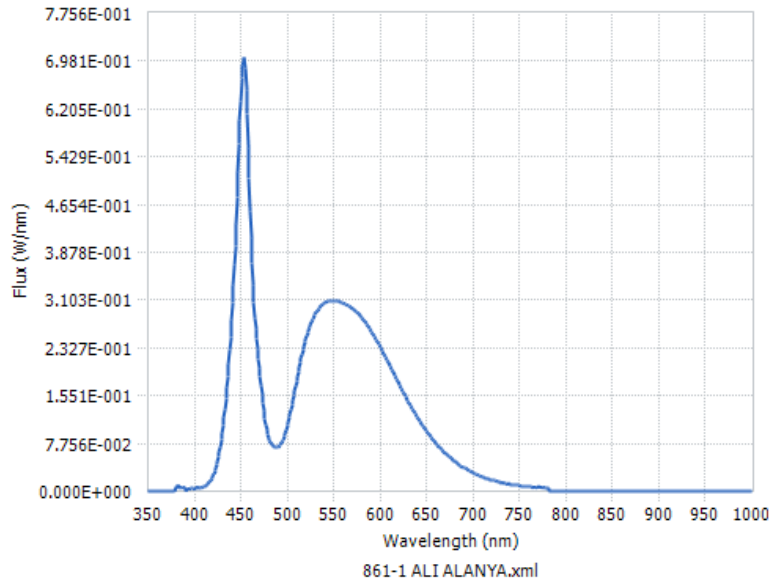
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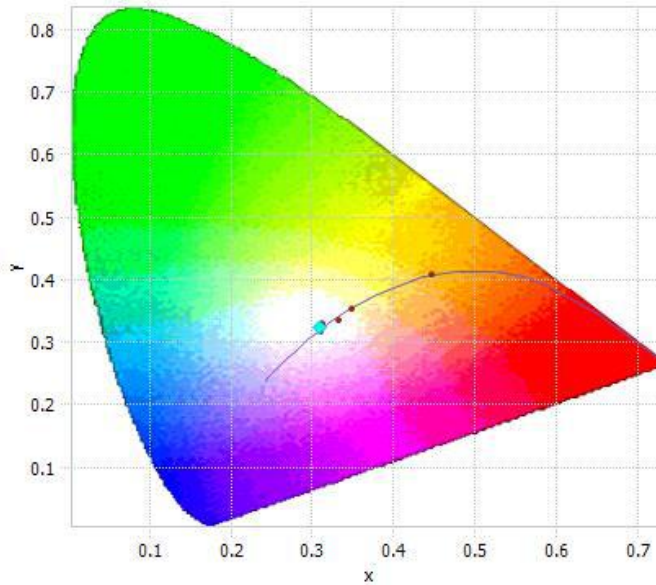
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▼ SPECTRAL FLUX GRAPH:



▼ CHROMATICITY DIAGRAM:

CIE 1931, 2 Degree



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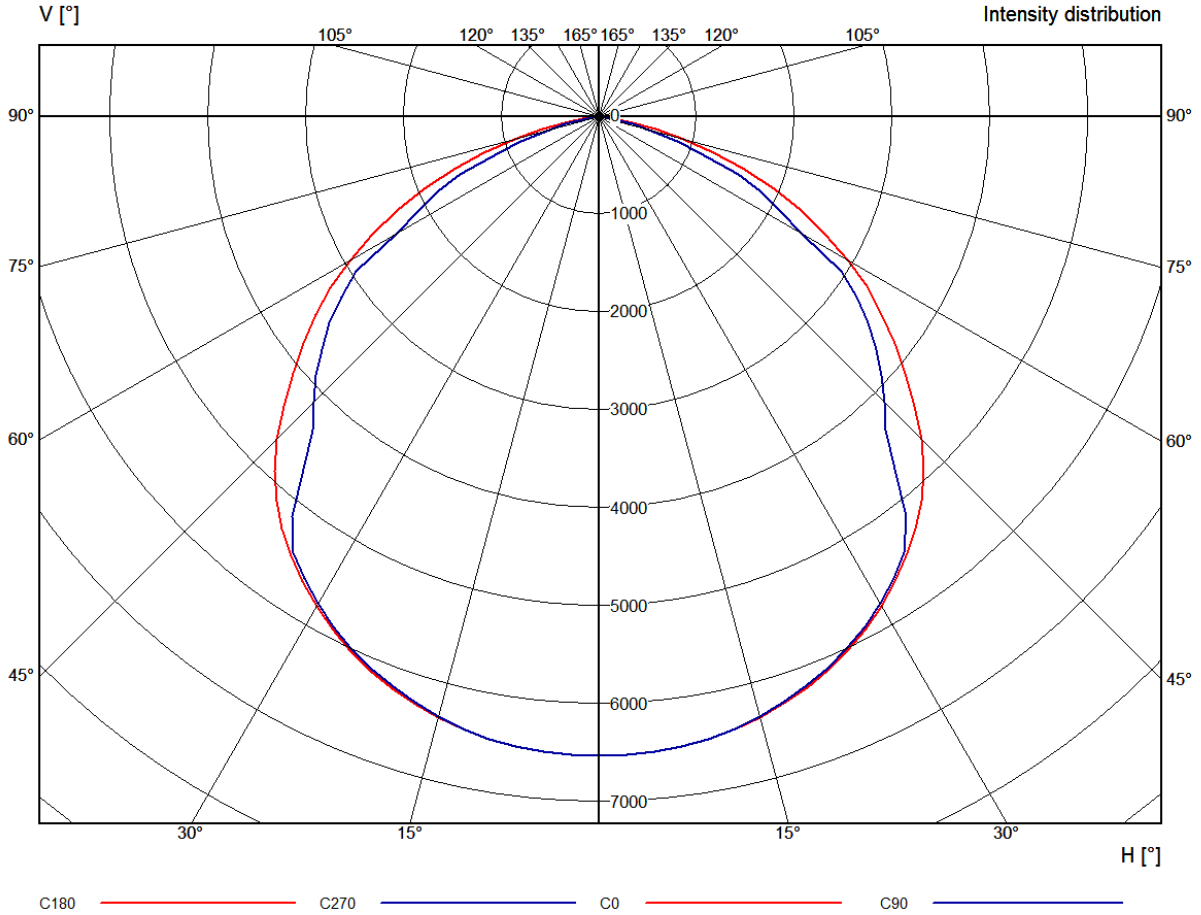
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FOTOMETRİ DİYAGRAMLARI (PHOTOMETRY DIAGRAMS)

Kutup Diyagramı (Polar Diagram)



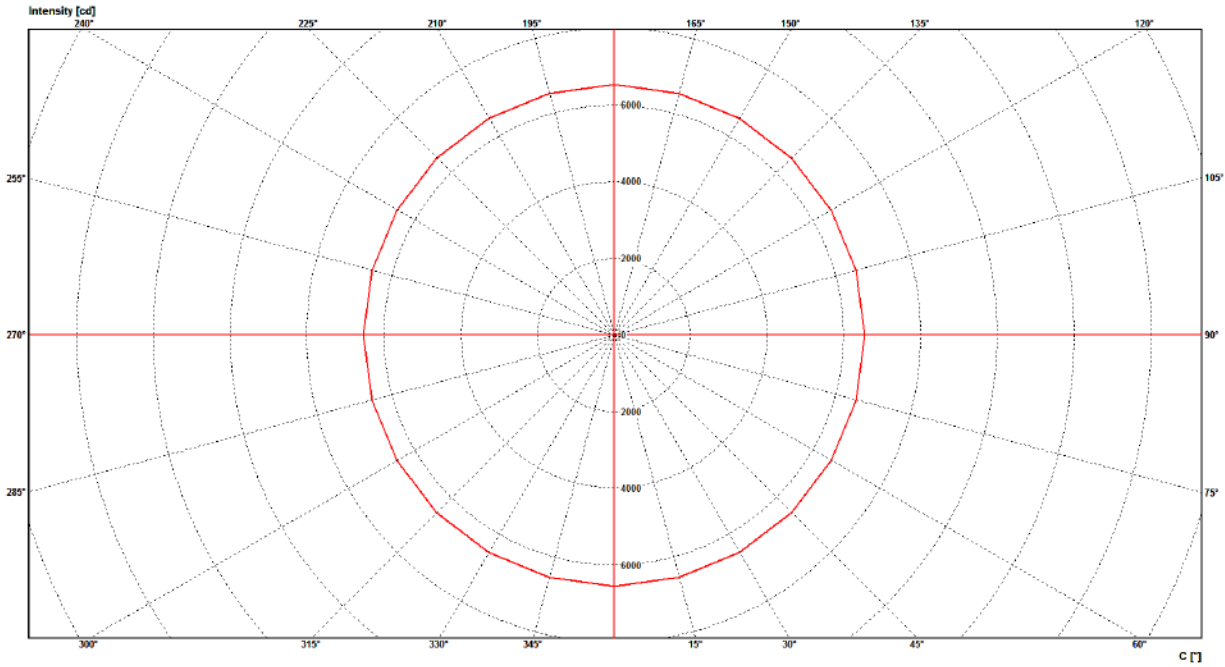
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Koni Diyagramı (Cone Diagram)





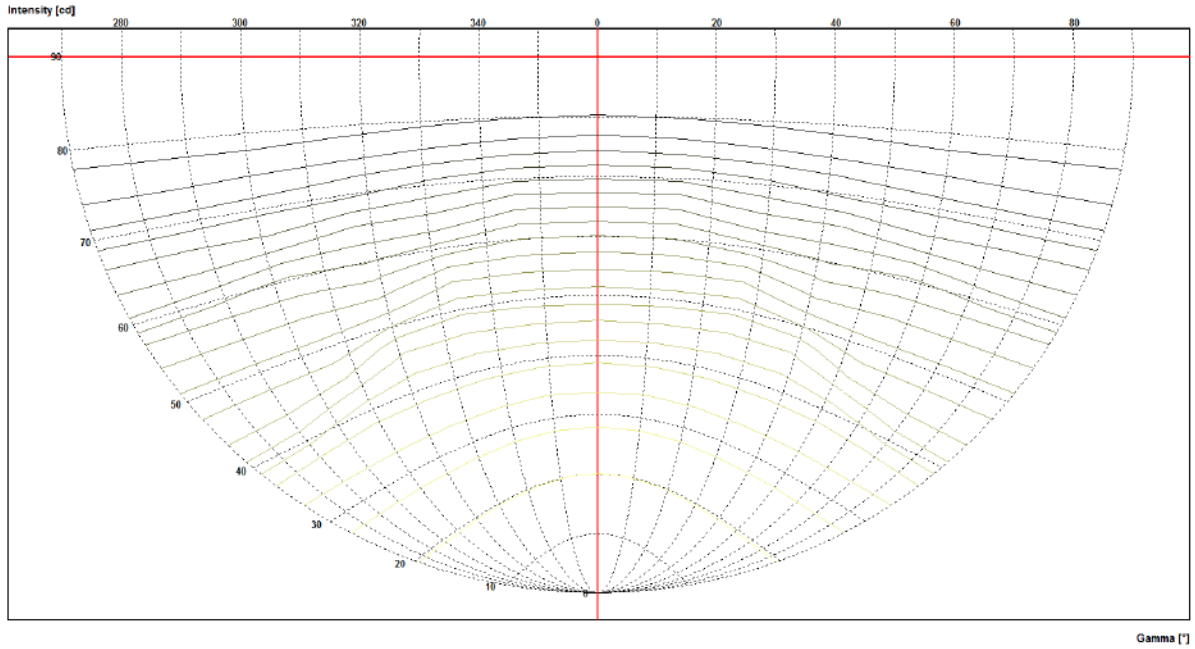
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Isocandela Diyagramı (Isocandela Diagram)



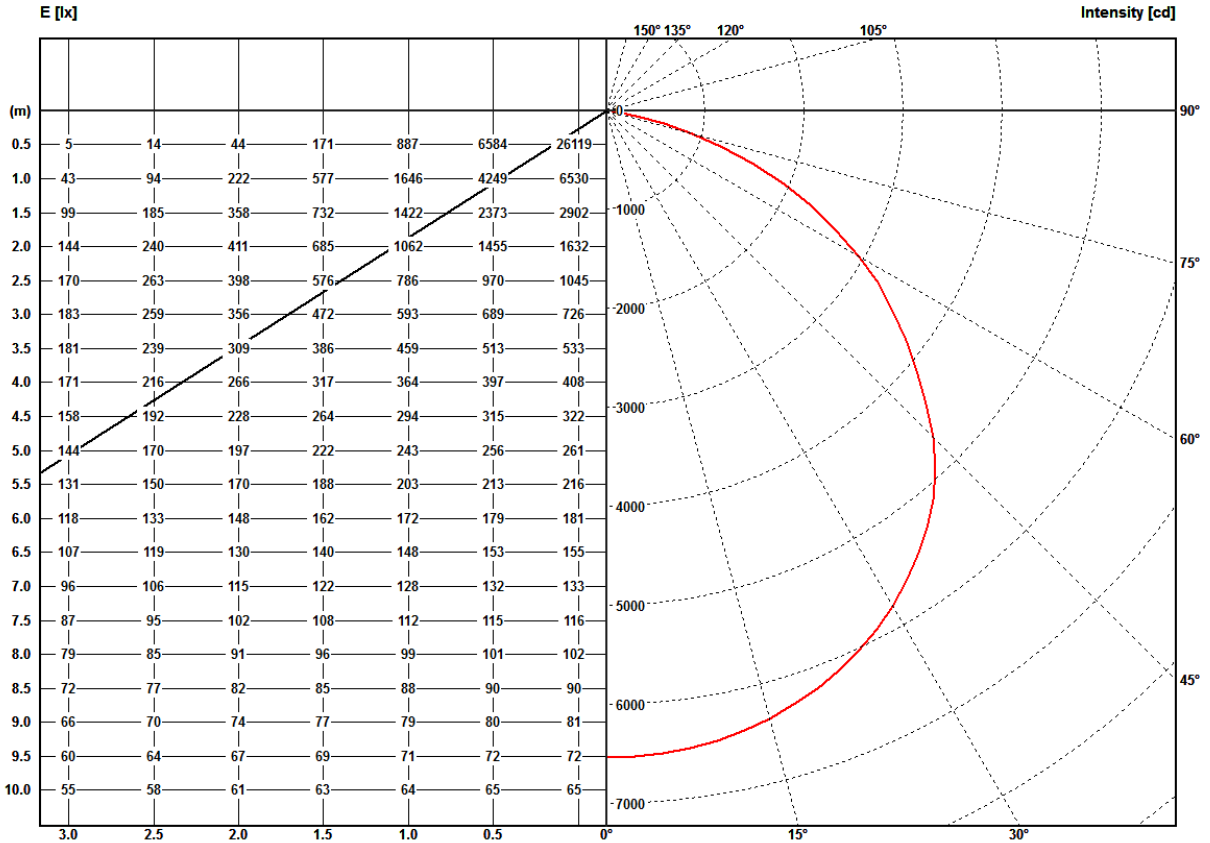
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Lüks-Kandela Diyagramı (Illuminance and Intensity Diagram)



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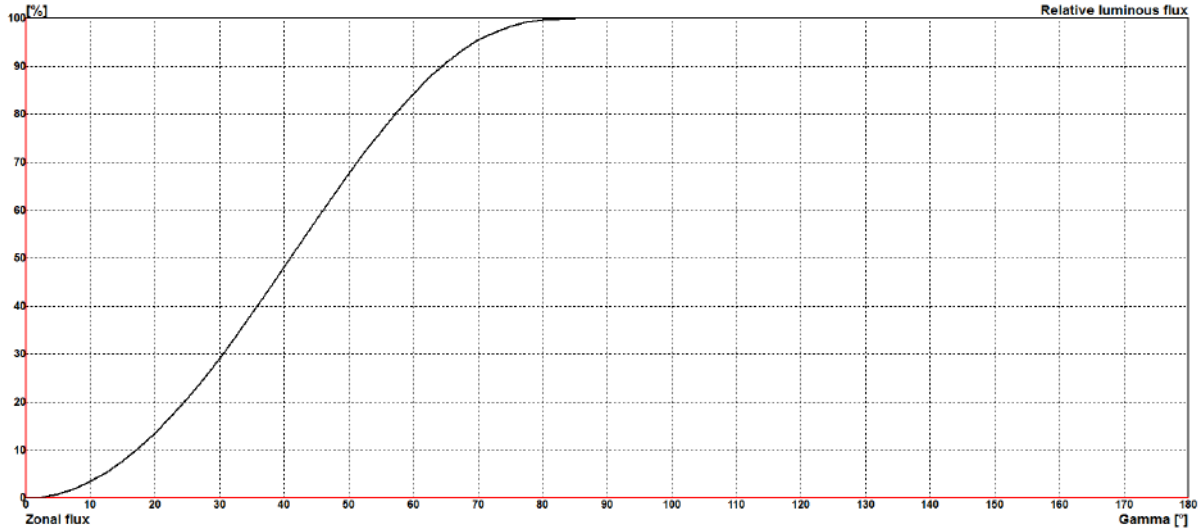
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### Bölgesel Akı Diyagramı (Zonal Flux Diagram)



## Ölçüm Sonuçları ve Analiz Raporu

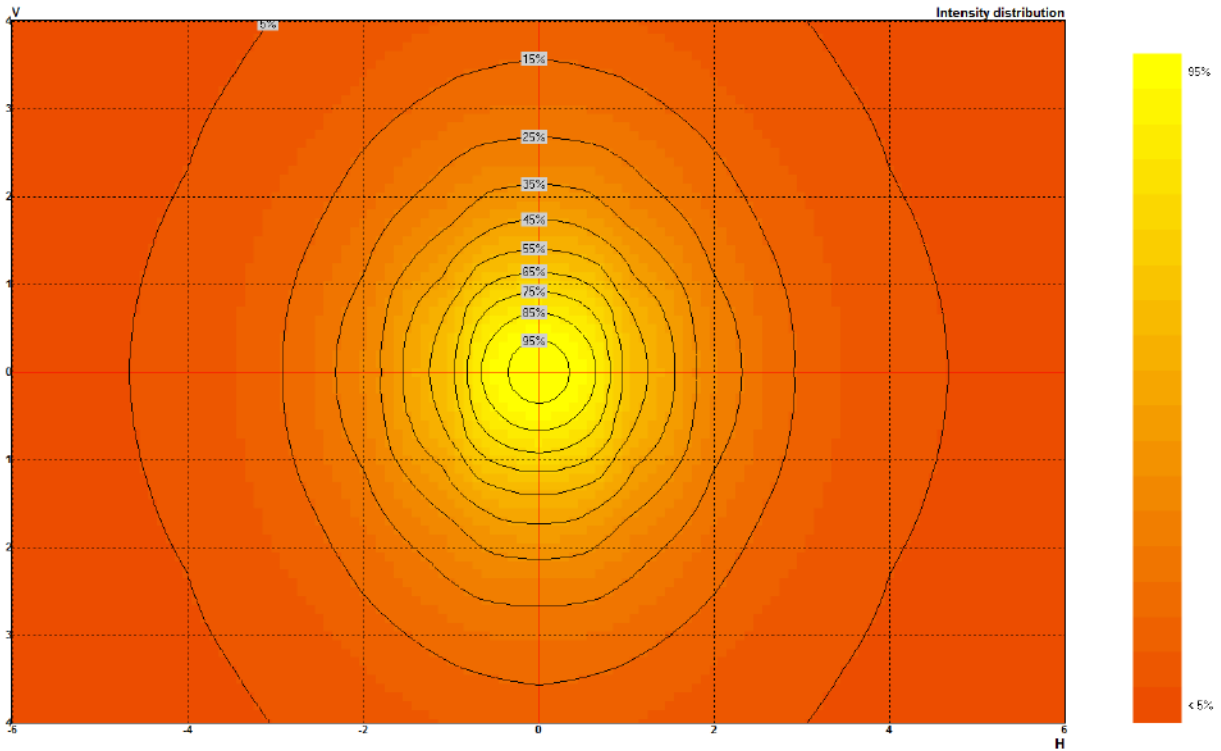
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### Eşğri Diyagramı (Isoline Diagram)



## Ölçüm Sonuçları ve Analiz Raporu

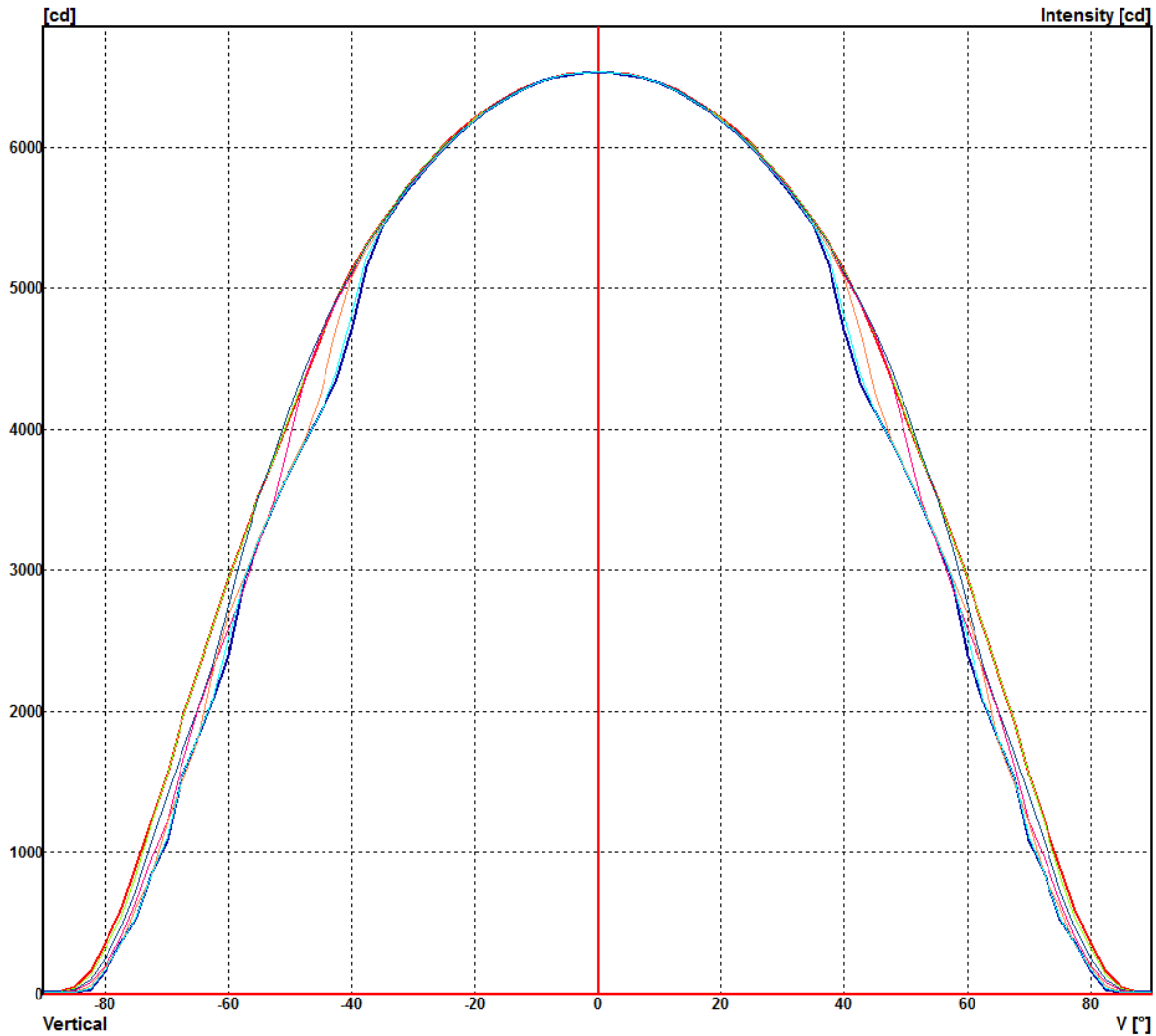
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### Kartezyen Diyagram (Cartesian Diagram)



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UGR Kamaşma Tablosu (UGR Glare Diagram)

Ceiling reflectance		0.7		0.5		0.3		0.7		0.5		0.3	
Wall reflectance		0.5		0.3		0.5		0.3		0.5		0.3	
Floor cavity reflectance		0.2											
Room dimension		Viewed crosswise						Viewed endwise					
2H	2H	18.1	19.7	18.5	20.0	20.4	17.4	19.0	17.8	19.3	19.6		
	3H	19.4	20.9	19.8	21.2	21.6	18.4	19.8	18.8	20.2	20.5		
	4H	19.8	21.2	20.2	21.5	21.9	18.6	19.9	19.0	20.3	20.6		
	6H	20.0	21.2	20.4	21.6	22.0	18.7	19.9	19.1	20.3	20.6		
	8H	19.9	21.1	20.3	21.5	21.9	18.6	19.8	19.0	20.2	20.6		
	12H	19.9	21.0	20.3	21.4	21.8	18.5	19.7	19.0	20.1	20.5		
4H	2H	18.6	20.0	19.0	20.3	20.7	18.1	19.4	18.5	19.8	20.1		
	3H	20.1	21.2	20.5	21.6	22.0	19.1	20.3	19.5	20.7	21.1		
	4H	20.5	21.5	21.0	21.9	22.4	19.4	20.4	19.8	20.8	21.3		
	6H	20.7	21.5	21.1	22.0	22.4	19.4	20.3	19.9	20.8	21.2		
	8H	20.7	21.5	21.1	21.9	22.4	19.4	20.2	19.9	20.7	21.1		
	12H	20.7	21.4	21.1	21.9	22.4	19.4	20.2	19.9	20.6	21.1		
8H	4H	20.5	21.4	21.0	21.8	22.3	19.5	20.3	20.0	20.8	21.2		
	6H	20.7	21.4	21.2	21.9	22.4	19.5	20.2	20.0	20.7	21.2		
	8H	20.8	21.4	21.3	21.9	22.4	19.6	20.2	20.1	20.7	21.2		
	12H	20.8	21.3	21.3	21.8	22.3	19.5	20.0	20.1	20.5	21.1		
12H	4H	20.5	21.3	21.0	21.7	22.2	19.5	20.3	20.0	20.7	21.2		
	6H	20.7	21.3	21.3	21.8	22.3	19.6	20.2	20.1	20.7	21.2		
	8H	20.7	21.2	21.3	21.8	22.3	19.6	20.1	20.1	20.6	21.1		

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TM5 Kullanım Faktörleri (TM5 Utilization Factors)

Utilization factors			LOR=100.0% DLOR=100.0% ULOR=0.0%								
Room reflection			Room index								
C	W	F	0.75	1	1.25	1.5	2	2.5	3	4	5
0.70	0.50	0.20	63	71	79	84	91	96	99	103	105
	0.30		56	64	72	78	85	91	94	99	102
	0.10		51	59	67	73	81	86	91	96	100
0.50	0.50	0.20	61	69	77	81	88	92	95	99	101
	0.30		55	63	71	76	83	88	91	96	99
	0.10		50	58	66	72	79	85	88	93	96
0.30	0.50	0.20	60	68	74	79	85	89	92	95	97
	0.30		54	62	69	74	81	86	89	93	95
	0.10		50	58	65	71	78	83	86	91	94
0.00	0.00	0.00	48	55	63	68	75	79	82	86	89
			SHR NOM=1.50			SHR MAX=1.63			SHR MAX TR=1.89		

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LiTG Kullanım Faktörleri (LiTG Utilization Factors)

Ceiling	70	80	80	50	50	80	80	80	50	50	30	0
Wall	50	50	30	50	30	80	50	30	50	30	30	0
Working plane	20	30	30	30	30	10	10	10	10	10	10	0
Roomindices	Utilization coefficients for ceiling mounted luminaires											
0.6	45	47	37	44	36	68	44	36	42	35	34	27
0.8	56	59	48	56	47	77	55	47	53	45	45	37
1	64	68	58	64	55	83	63	55	61	53	52	45
1.25	74	79	68	73	65	90	72	64	69	63	61	54
1.5	80	86	76	80	72	94	78	71	75	69	68	61
2	88	96	86	88	81	98	85	79	82	77	75	69
2.5	94	103	94	94	88	101	91	85	87	83	81	75
3	99	108	101	99	94	104	95	90	91	87	86	80
4	103	114	107	103	99	106	98	94	95	91	89	84
5	106	118	112	107	102	107	101	97	97	94	92	87
Roomindices	Utilization coefficients for pendant mounted luminaires											
0.6	42	43	35	43	35	64	42	34	41	34	34	27
0.8	53	55	46	54	46	73	53	45	52	45	44	37
1	62	64	55	62	54	80	61	53	59	52	52	45
1.25	71	74	65	71	64	87	70	62	68	62	61	54
1.5	78	82	73	78	70	91	76	69	74	68	67	61
2	86	91	83	86	79	97	83	77	81	76	75	69
2.5	92	99	91	92	86	100	89	83	86	82	81	75
3	97	105	97	97	92	103	93	88	90	86	85	80
4	101	110	103	102	97	105	97	93	94	90	89	84
5	105	115	108	105	101	107	100	96	97	94	92	87



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IES Kullanım Faktörleri (IES Utilization Factors)

Ceiling	80	80	80	80	70	70	70	70	50	50	50	30	30	30	10	10	10	0
Wall	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Working plane	20 %																	
Cavity ratio	Utilization coefficients																	
1	114	109	104	100	111	106	102	98	102	98	95	98	95	92	94	91	89	87
2	105	96	89	84	102	94	88	83	91	85	81	87	83	79	84	80	77	75
3	95	85	76	70	93	83	75	69	80	74	68	77	72	67	74	70	66	64
4	88	75	66	59	85	74	65	59	71	64	58	69	62	57	67	61	56	54
5	79	66	56	49	77	64	55	49	62	54	48	60	53	48	58	52	47	45
6	72	58	48	42	70	57	48	42	55	47	41	53	46	41	52	45	40	38
7	66	52	42	36	64	51	42	36	49	41	36	48	41	35	47	40	35	33
8	61	46	37	31	59	46	37	31	44	36	31	43	36	30	42	35	30	28
9	58	42	34	28	56	43	34	28	41	33	28	40	33	27	39	32	27	25
10	54	39	30	24	52	40	30	24	38	30	25	37	30	24	36	29	24	22

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Bölgesel Akı Tablosu (Zonal Flux Table)

V	Imin	Imax	Imean	Flux [lm]	Total [lm]	LOR [%]	Total [%]
0.0	366.7	366.7	366.7	0.00	0.00	0.00	0.00
2.5	366.5	366.5	366.5	39.04	39.04	0.22	0.22
5.0	365.7	365.8	365.7	116.87	155.91	0.66	0.88
7.5	364.4	364.5	364.5	194.00	349.91	1.09	1.97
10.0	362.3	362.6	362.5	269.87	619.78	1.52	3.48
12.5	359.6	359.9	359.7	343.84	963.62	1.93	5.41
15.0	356.2	356.7	356.4	415.41	1379.03	2.33	7.75
17.5	352.2	352.8	352.5	484.10	1863.13	2.72	10.46
20.0	347.5	348.4	348.0	549.45	2412.58	3.09	13.55
22.5	342.4	343.4	342.8	610.98	3023.56	3.43	16.98
25.0	336.3	337.6	336.9	668.09	3691.66	3.75	20.73
27.5	329.7	331.2	330.5	720.36	4412.02	4.05	24.78
30.0	322.4	324.2	323.3	767.38	5179.40	4.31	29.09
32.5	314.3	316.3	315.3	808.46	5987.86	4.54	33.63
35.0	305.4	307.7	306.5	843.11	6830.97	4.74	38.37
37.5	289.3	298.4	296.0	869.53	7700.51	4.88	43.25
40.0	264.1	287.9	282.1	883.10	8583.61	4.96	48.21
42.5	243.4	276.1	266.3	882.44	9466.05	4.96	53.16
45.0	231.7	263.6	251.1	873.14	10339.19	4.90	58.07
47.5	219.9	249.2	235.9	858.46	11197.65	4.82	62.89
50.0	207.7	232.9	219.7	835.86	12033.50	4.69	67.58
52.5	194.7	215.4	203.3	805.06	12838.56	4.52	72.11
55.0	179.4	198.2	187.8	769.69	13608.25	4.32	76.43
57.5	162.4	182.6	171.6	729.23	14337.48	4.10	80.52
60.0	134.5	165.3	151.1	673.35	15010.84	3.78	84.31
62.5	116.6	146.4	130.4	602.35	15613.19	3.38	87.69
65.0	100.6	127.8	111.9	530.22	16143.41	2.98	90.67
67.5	84.0	108.9	94.0	459.87	16603.29	2.58	93.25
70.0	60.9	87.2	73.4	380.68	16983.96	2.14	95.39
72.5	47.0	69.1	55.8	298.53	17282.49	1.68	97.07
75.0	29.3	50.0	37.7	219.14	17501.63	1.23	98.30
77.5	19.3	33.4	24.1	146.48	17648.11	0.82	99.12
80.0	9.3	19.6	12.9	88.50	17736.60	0.50	99.62
82.5	2.0	9.2	4.9	42.91	17779.51	0.24	99.86
85.0	1.0	2.9	1.6	15.76	17795.27	0.09	99.95
87.5	0.7	1.0	0.8	5.93	17801.20	0.03	99.98
90.0	0.7	0.8	0.7	3.85	17805.05	0.02	100.00

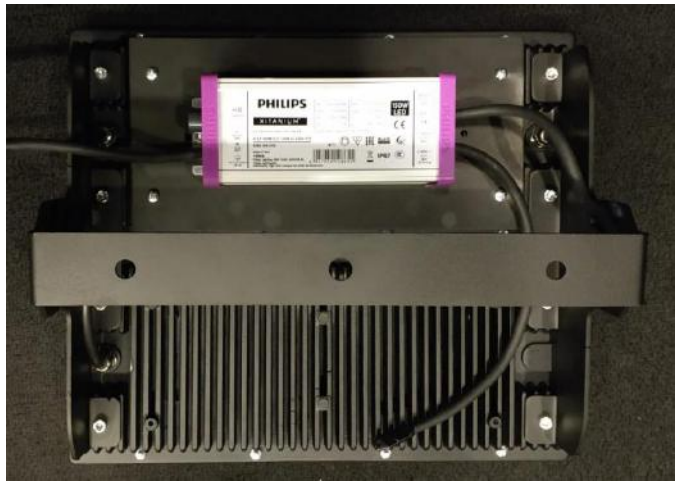
Ölçüm Sonuçları ve Analiz Raporu  
(Measurement Results and Analysis Report)

AB-1115-T

00861-1

12.11.2019

Test Ürünü Fotoğrafı (Photo of the Test Item)



Raporun Sonu (End of Report)