

Servicios de Laboratorio

Goniofotometría



Test report realizado en Dark Room



El test report suministrado por Luz negra y realizado por el Goniofotómetro, nos ofrecerá mucha información y muy detallada sobre los aspectos lumínicos de la luminaria o del producto led analizado. De los cuales destacamos los siguientes:

- Lúmenes
- Eficiencia lumínica
- Diagrama ISOLUX
- Diagrama de distribución lumínica
- Diagrama de flujo por zonas
- Curvas de UGR
- Diagrama de Isocandelas
- Cono de iluminación de luxes
- Curva de iluminación
- Datos sobre la distribución
- Plugins EULUMDAT (.ldt)
- Plugins IESNA (.ies)
- Plugins CIBSE (.cib)
- Plugins CIE (.cie)
- Otros...

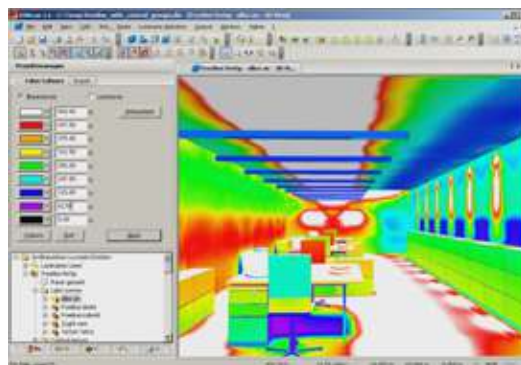
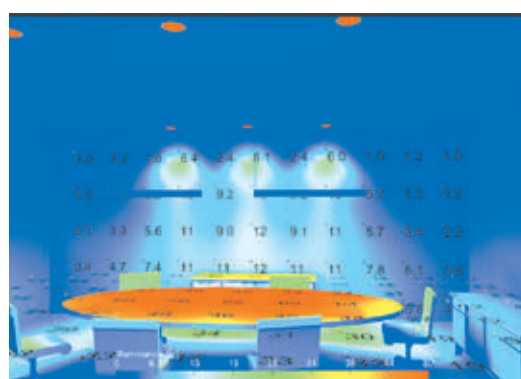


Image taken from DIALux



De todos ellos, lo más demandado suelen ser los plugins en formato .ies o .ldt para su uso en programas de cálculo lumínico profesional y renderización 3D como son **DIALux** y **RELUX**.

Con los plugins suministrados podremos, en dichos programas, renderizar la curva de luminosidad que nos ofrece el producto medido comprobando así si la luminaria cumple con los requisitos del proyecto en cuestión.

Tanto **DIALux** como **RELUX**, son en sus versiones programas gratuitos y además de permitir comprobar si la luminosidad y su distribución son correctas acorde a la necesidad del cliente, nos permiten diseñar y renderizar de forma sencilla y rápida una estancia añadiendo personas y objetos como mesas, camas, sillas, etc.... consiguiendo así un 3D mucho más realista.



Image taken from DIALux

La precisión y por lo tanto el coste de las mediciones realizadas con el Goniofotómetro van en función de la precisión que se necesite ya que una medición rápida se puede realizar en tan sólo 30 minutos. Una medición normal precisa de 3 a 4 horas y una medición con la máxima precisión requiere de 6 a 8 horas. Consulte con nuestro departamento técnico, las tarifas y descuentos. (Para clientes habituales y proyectos a medida se realizan mediciones gratuitas o con grandes descuentos).

GONIOMETER TEST REPORT

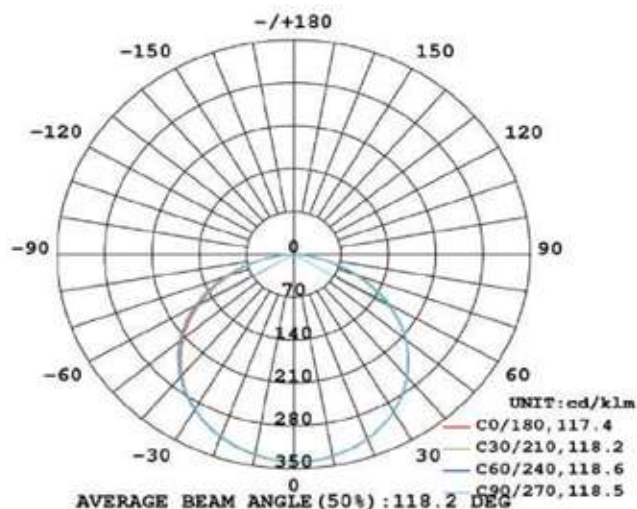
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LUMINAIRE PHOTOMETRIC TEST REPORT

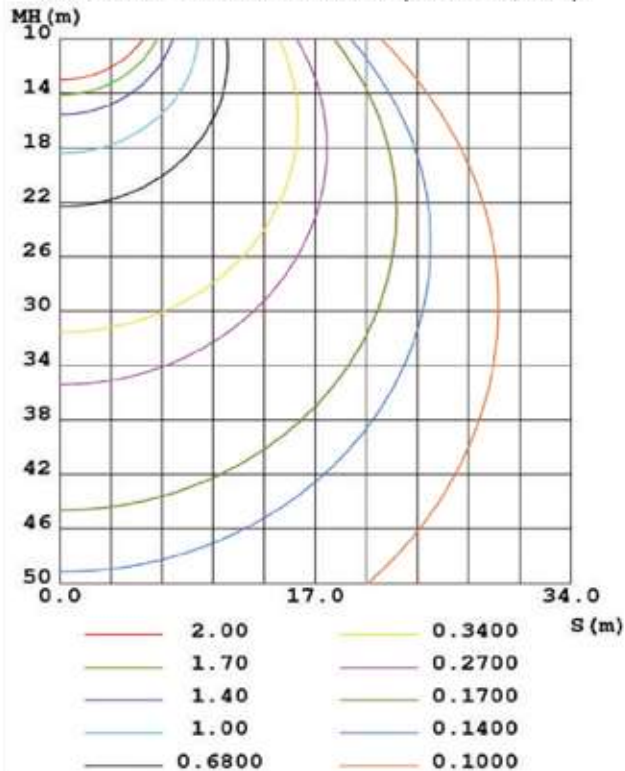
NAME: Tira rigida	TYPE: led	WEIGHT: 15
SPEC.: 435	DIM.: 560x20x6mm	SERIAL No.: 3234
MFR.: Luz Negra	SUR.: 22	Shielding Angle: 232

DATA OF LAMP		PHOTOMETRIC DATA				Eff: 143.32 lm/W
MODEL	560173	Imax (cd/klm)	338.6	S/MH (C0/180)	1.29	
NOMINAL POWER (W)	17.17	LOR (%)	102.6	S/MH (C90/270)	1.28	
RATED VOLTAGE (V)	25.308	TOTAL FLUX (lm/klm)	1025.9	η UP, DN (C0-180)	0.1, 51.3	
NOMINAL FLUX (lm)	2475	CIE CLASS	DIRECT	η UP, DN (C180-360)	0.1, 51.1	
LAMPS INSIDE	1	η up (%)	0.2	CIBSE SHR NOM	1.50	
TEST VOLTAGE (V)	220.0	η down (%)	102.4	CIBSE SHR MAX	1.50	

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0 PLANE ISOLUX DIAGRAM (UNIT: lx/klm)



C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: MEDIUM
Temperature: 25.3DEG
Operators: Sergio Carneros
Test Date: 02 May 2017

γ Range: 0 - 110DEG
 γ Interval: 0.5DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity: 65.0%
Test Distance: 8.200m [K=1.0000]
Remarks:

ZONAL FLUX DIAGRAM
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	334.1	334.9	334.8	334.2	332.3	331.6	331.4	332.3	0- 10	32.05	32.05	3.12, 3.2
20	320.0	320.6	320.5	320.4	316.9	316.5	315.8	316.6	10- 20	92.37	124.4	12.1, 12.4
30	296.0	296.0	296.0	296.6	292.2	292.5	291.6	291.6	20- 30	141.8	266.2	25.9, 26.6
40	261.8	261.4	261.6	262.9	258.0	260.1	259.2	257.2	30- 40	174.2	440.4	42.9, 44
50	217.3	216.9	217.2	219.5	214.6	218.8	218.0	213.6	40- 50	185.1	625.5	61, 62.5
60	160.8	162.9	163.6	166.8	162.5	167.4	166.3	160.4	50- 60	171.2	796.7	77.7, 79.7
70	98.66	100.9	102.3	106.2	103.0	107.1	105.5	98.64	60- 70	132.7	929.4	90.6, 92.9
80	37.61	37.48	38.83	43.46	41.34	44.12	42.65	38.81	70- 80	74.98	1004	97.9, 100
90	1.693	1.903	0.7814	2.807	2.355	2.873	1.014	1.651	80- 90	19.13	1024	99.8, 102
100	1.004	1.094	0.9235	0.9990	1.172	1.020	0.8838	0.9243	90-100	1.214	1025	99.9, 102
110	1.257	1.304	1.329	1.274	1.235	1.265	1.295	1.281	100-110	1.189	1026	100, 103
120	0	0	0	0	0	0	0	0	110-120	0.6332	1026	100, 103
130	0	0	0	0	0	0	0	0	120-130	0	1026	100, 103
140	0	0	0	0	0	0	0	0	130-140	0	1026	100, 103
150	0	0	0	0	0	0	0	0	140-150	0	1026	100, 103
160	0	0	0	0	0	0	0	0	150-160	0	1026	100, 103
170	0	0	0	0	0	0	0	0	160-170	0	1026	100, 103
180	0	0	0	0	0	0	0	0	170-180	0	1026	100, 103
DEG	LUMINOUS INTENSITY:cd/klm									UNIT:lm/klm		

C Range: 0 - 360DEG
 C Interval: 5.0DEG
 Test Speed: MEDIUM
 Temperature:25.3DEG
 Operators:Sergio Carneros
 Test Date:02 May 2017

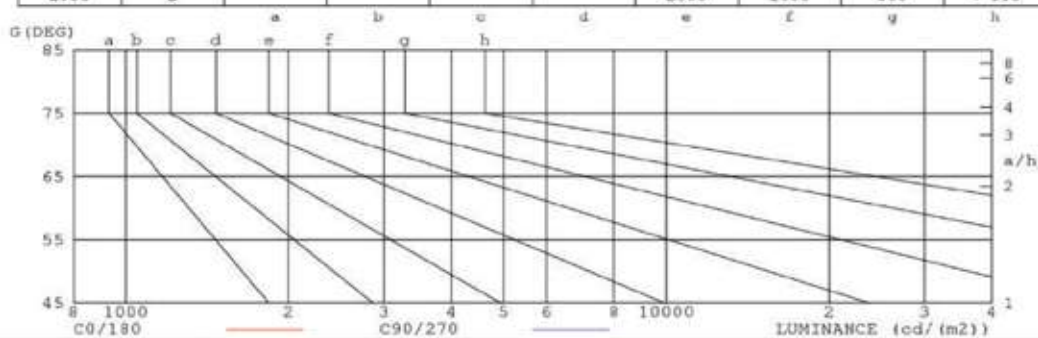
γ Range: 0 - 110DEG
 γ Interval: 0.5DEG
 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity:65.0%
 Test Distance:8.200m [K=1.0000]
 Remarks:

LUMINANCE LIMITATION CURVES

NAME: Tira rigida	TYPE: led	WEIGHT: 15
SPEC.: 435	DIM.: 560x20x6mm	SERIAL No.: 3234
MFR.: Luz Negra	SUR.: 22	Shielding Angle: 232

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	202	204
80	268	278
75	315	336
70	357	371
65	383	393
60	398	406
55	411	414
50	418	419
45	422	422

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Test Distance: 8.200m [K=1.0000]
Remarks:

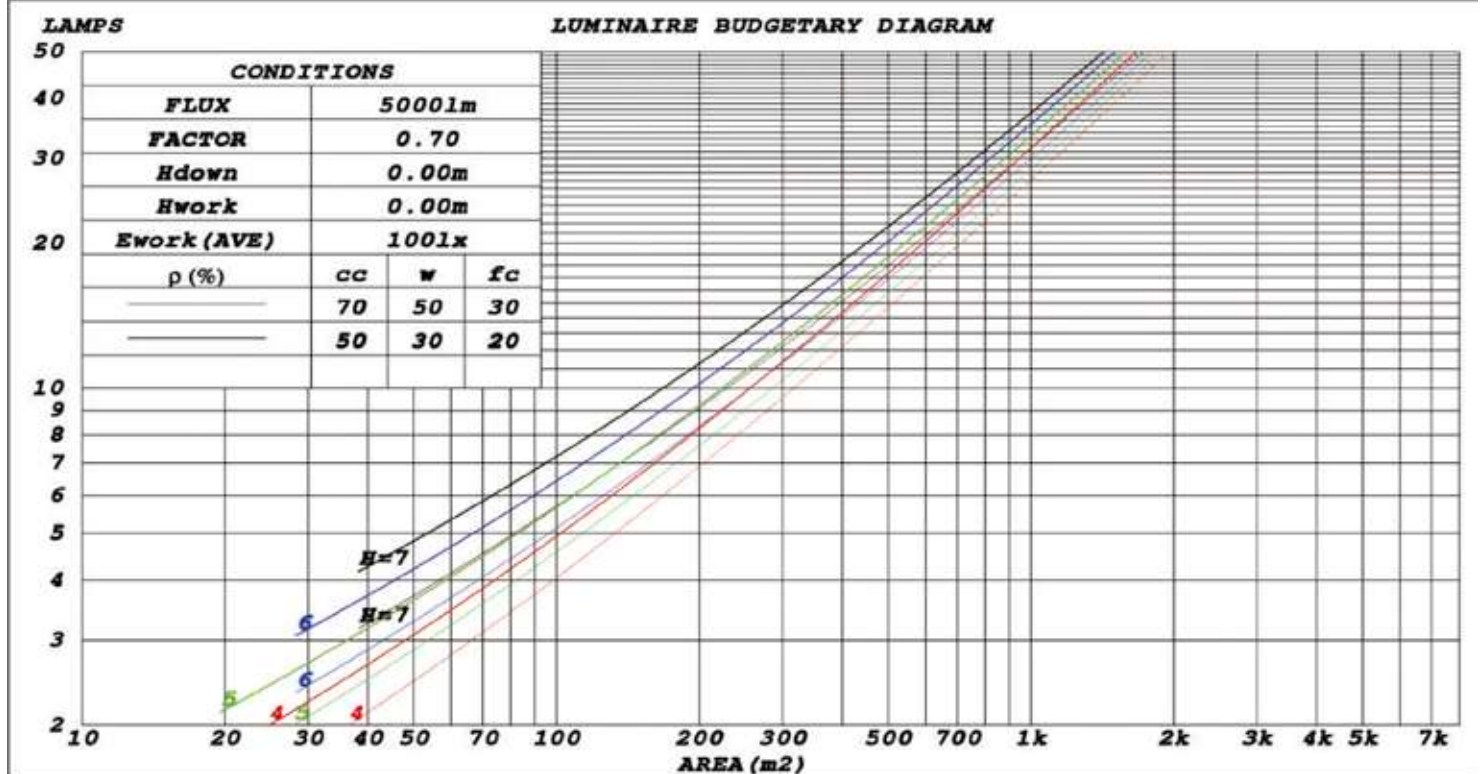
GONIOMETER TEST REPORT

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CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

NAME: Tira rigida	TYPE:led	WEIGHT:15
SPEC.:435	DIM.: 560x20x6mm	SERIAL No.:3234
MFR.: Luz Negra	SUR.:22	Shielding Angle:232

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						Coefficients of Utilization(CU)									
0.0	1.22	1.22	1.22	1.19	1.19	1.19	1.14	1.14	1.14	1.09	1.09	1.09	1.04	1.04	1.04	1.02
1.0	1.06	1.02	.98	1.04	.90	.96	.90	.96	.93	.95	.93	.90	.92	.89	.87	.85
2.0	.92	.85	.79	.90	.84	.78	.87	.81	.76	.83	.79	.74	.80	.76	.73	.71
3.0	.81	.72	.65	.79	.71	.65	.76	.69	.64	.73	.67	.62	.70	.66	.61	.59
4.0	.71	.62	.55	.70	.61	.55	.67	.60	.54	.65	.58	.53	.63	.57	.52	.50
5.0	.64	.54	.47	.62	.54	.47	.60	.52	.46	.58	.51	.46	.56	.50	.45	.43
6.0	.57	.48	.41	.56	.47	.41	.54	.46	.40	.52	.45	.40	.51	.45	.40	.38
7.0	.52	.43	.36	.51	.42	.36	.49	.41	.36	.48	.41	.35	.46	.40	.35	.33
8.0	.47	.38	.32	.46	.38	.32	.45	.37	.32	.44	.37	.32	.42	.36	.31	.29
9.0	.43	.35	.29	.43	.34	.29	.41	.34	.29	.40	.33	.28	.39	.33	.28	.26
10.0	.40	.32	.26	.39	.31	.26	.38	.31	.26	.37	.30	.26	.36	.30	.26	.24



GONIOMETER TEST REPORT
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WEC AND CCEC

NAME: Tira rigida	TYPE:led	WEIGHT:15
SPEC.:435	DIM.: 560x20x6mm	SERIAL No.:3234
MFR.: Luz Negra	SUR.:22	Shielding Angle:232

ρ_{cc}	80%			70%			50%			30%			10%			0	
ρ_w	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0	
ρ_{fc}	20%			20%			20%			20%			20%			0	
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients (WEC)										
0.0																	
1.0	.322	.183	.058	.315	.180	.057	.301	.173	.055	.288	.166	.053	.277	.160	.052		
2.0	.303	.166	.051	.297	.164	.050	.285	.158	.049	.274	.153	.048	.263	.149	.047		
3.0	.281	.149	.045	.275	.147	.044	.264	.143	.044	.254	.139	.043	.245	.136	.042		
4.0	.259	.135	.040	.254	.133	.039	.244	.130	.039	.235	.126	.038	.227	.123	.038		
5.0	.239	.122	.035	.235	.120	.035	.226	.118	.035	.218	.115	.034	.211	.113	.034		
6.0	.222	.111	.032	.218	.110	.032	.210	.108	.031	.203	.105	.031	.196	.103	.031		
7.0	.206	.102	.029	.203	.101	.029	.196	.099	.029	.189	.097	.028	.183	.095	.028		
8.0	.192	.094	.026	.189	.093	.026	.183	.091	.026	.177	.090	.026	.172	.088	.026		
9.0	.180	.087	.024	.177	.086	.024	.172	.085	.024	.167	.084	.024	.162	.082	.024		
10.0	.169	.081	.023	.167	.081	.022	.162	.079	.022	.157	.078	.022	.153	.077	.022		

ρ_{cc}	80%			70%			50%			30%			10%			0
ρ_w	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρ_{fc}	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients (CCEC)									
0.0	.197	.197	.197	.169	.169	.169	.115	.115	.115	.066	.066	.066	.021	.021	.021	
1.0	.187	.162	.139	.160	.139	.120	.110	.096	.083	.063	.055	.048	.020	.018	.016	
2.0	.179	.137	.102	.153	.118	.088	.105	.082	.061	.061	.048	.036	.019	.015	.012	
3.0	.171	.119	.078	.147	.103	.067	.101	.071	.047	.058	.042	.028	.019	.014	.009	
4.0	.164	.106	.061	.140	.091	.053	.097	.064	.037	.056	.037	.022	.018	.012	.007	
5.0	.156	.095	.050	.134	.082	.043	.092	.057	.031	.053	.034	.018	.017	.011	.006	
6.0	.149	.086	.042	.128	.075	.036	.088	.052	.026	.051	.031	.015	.017	.010	.005	
7.0	.142	.079	.036	.122	.069	.031	.084	.048	.022	.049	.028	.013	.016	.009	.004	
8.0	.135	.073	.031	.116	.064	.027	.080	.045	.019	.047	.026	.011	.015	.009	.004	
9.0	.129	.068	.028	.111	.059	.024	.077	.042	.017	.045	.025	.010	.014	.008	.003	
10.0	.123	.064	.025	.106	.056	.022	.073	.039	.015	.043	.023	.009	.014	.008	.003	

C Range: 0 - 360DEG
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γ Range: 0 - 110DEG
 γ Interval: 0.5DEG
 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity:65.0%
 Test Distance:8.200m [K=1.0000]
 Remarks:

GONIOMETER TEST REPORT
Page 6 Of 16
UGR(Unified Glare Rating) Table

NAME: Tira rigida					TYPE:led					WEIGHT:15				
SPEC.:435					DIM.: 560x20x6mm					SERIAL No.:3234				
MFR.: Luz Negra					SUR.:22					Shielding Angle:232				
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	6.7	8.2	6.9	8.4	8.6	6.7	8.3	7.0	8.5	8.7				
3H	8.2	9.6	8.5	9.8	10.1	8.3	9.7	8.6	10.0	10.2				
4H	8.7	10.1	9.0	10.3	10.6	8.9	10.2	9.2	10.5	10.7				
6H	9.1	10.3	9.4	10.6	10.9	9.2	10.5	9.6	10.8	11.1				
8H	9.2	10.4	9.5	10.7	11.0	9.3	10.6	9.7	10.8	11.1				
12H	9.2	10.4	9.6	10.7	11.0	9.4	10.6	9.7	10.9	11.2				
4H 2H	7.3	8.6	7.6	8.9	9.2	7.4	8.7	7.7	9.0	9.2				
3H	9.0	10.1	9.3	10.4	10.8	9.1	10.3	9.4	10.6	10.9				
4H	9.6	10.7	10.0	11.0	11.4	9.7	10.8	10.1	11.2	11.5				
6H	10.1	11.0	10.5	11.4	11.8	10.2	11.2	10.6	11.5	11.9				
8H	10.2	11.1	10.6	11.5	11.9	10.4	11.2	10.8	11.6	12.0				
12H	10.3	11.1	10.7	11.5	11.9	10.4	11.2	10.9	11.6	12.0				
8H 4H	9.9	10.8	10.3	11.1	11.5	10.0	10.9	10.4	11.2	11.6				
6H	10.4	11.2	10.9	11.6	12.0	10.6	11.3	11.0	11.7	12.1				
8H	10.7	11.3	11.1	11.7	12.2	10.8	11.4	11.2	11.9	12.3				
12H	10.8	11.4	11.3	11.8	12.3	10.9	11.5	11.4	11.9	12.4				
12H 4H	9.9	10.7	10.3	11.1	11.5	10.0	10.8	10.4	11.2	11.6				
6H	10.5	11.1	11.0	11.6	12.0	10.6	11.3	11.1	11.7	12.1				
8H	10.7	11.3	11.2	11.7	12.2	10.8	11.4	11.3	11.8	12.3				
Variations with the observer position at spacings:														
S = 1.0H	+ 0.2 / - 0.2					+ 0.1 / - 0.2								
1.5H	+ 0.2 / - 0.3					+ 0.2 / - 0.3								
2.0H	+ 0.2 / - 0.3					+ 0.2 / - 0.3								

 CIE Pub.117, 2475 lm Total Lamp Luminous Flux Correct ($8\log(F/F_0) = 3.1$)

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 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity:65.0%
 Test Distance:8.200m [K=1.0000]
 Remarks:

UTILIZATION FACTORS TABLE

NAME: Tira rigida	TYPE: led	WEIGHT: 15
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MFR.: Luz Negra	SUR.: 22	Shielding Angle: 232

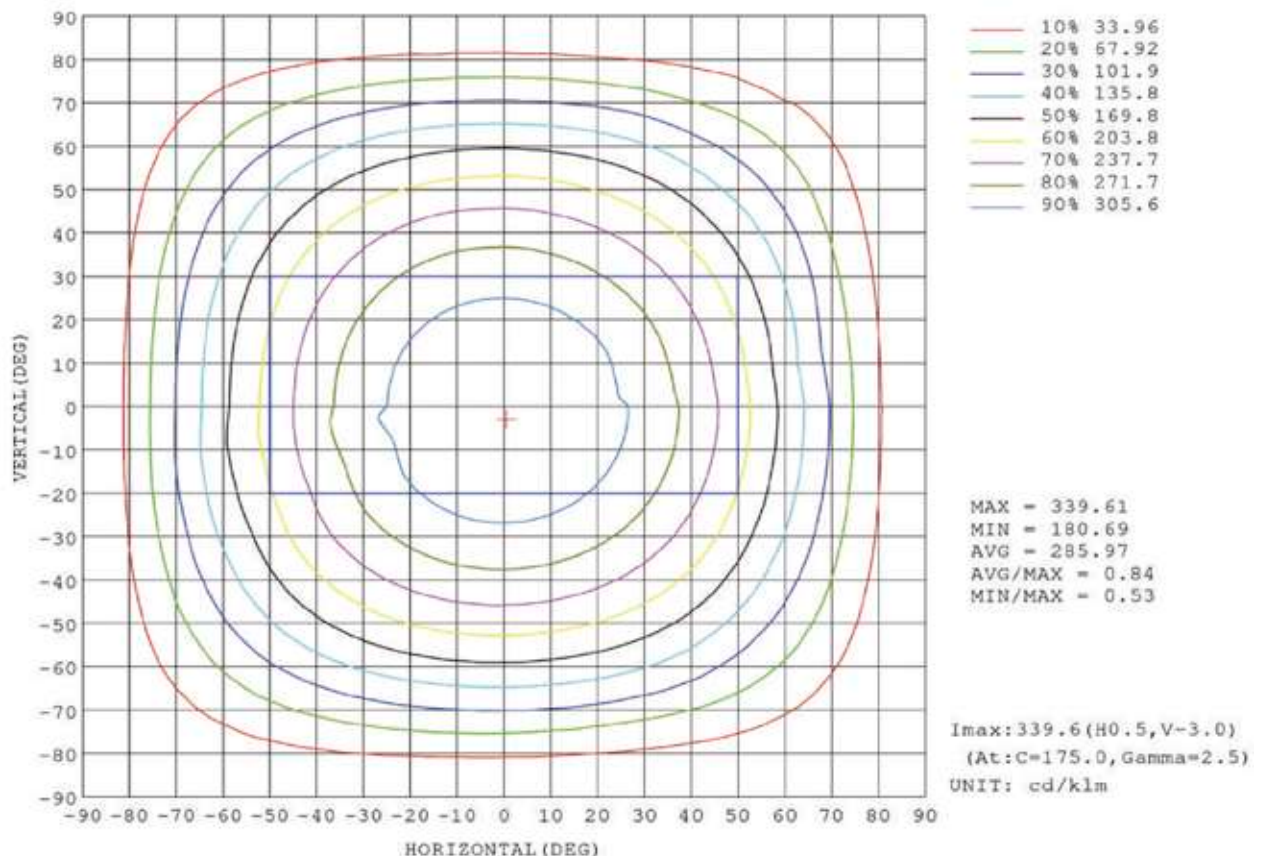
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS (PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	58	46	39	57	46	39	56	45	38	32
0.80	68	56	48	67	56	48	65	55	48	41
1.00	77	65	58	76	65	57	73	66	57	49
1.25	84	73	66	83	73	66	80	71	65	57
1.50	90	79	72	88	78	71	85	76	70	62
2.00	97	88	81	95	87	80	91	84	79	71
2.50	101	93	86	99	91	86	95	89	84	75
3.00	104	97	91	102	96	90	98	93	88	79
4.00	109	103	98	106	101	96	102	97	94	84
5.00	111	106	102	109	104	100	104	100	97	88
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004				Suspended				SHRNOM = 1.25		

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ISOCANDELA DIAGRAM

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MFR.: Luz Negra	SUR.:22	Shielding Angle:232

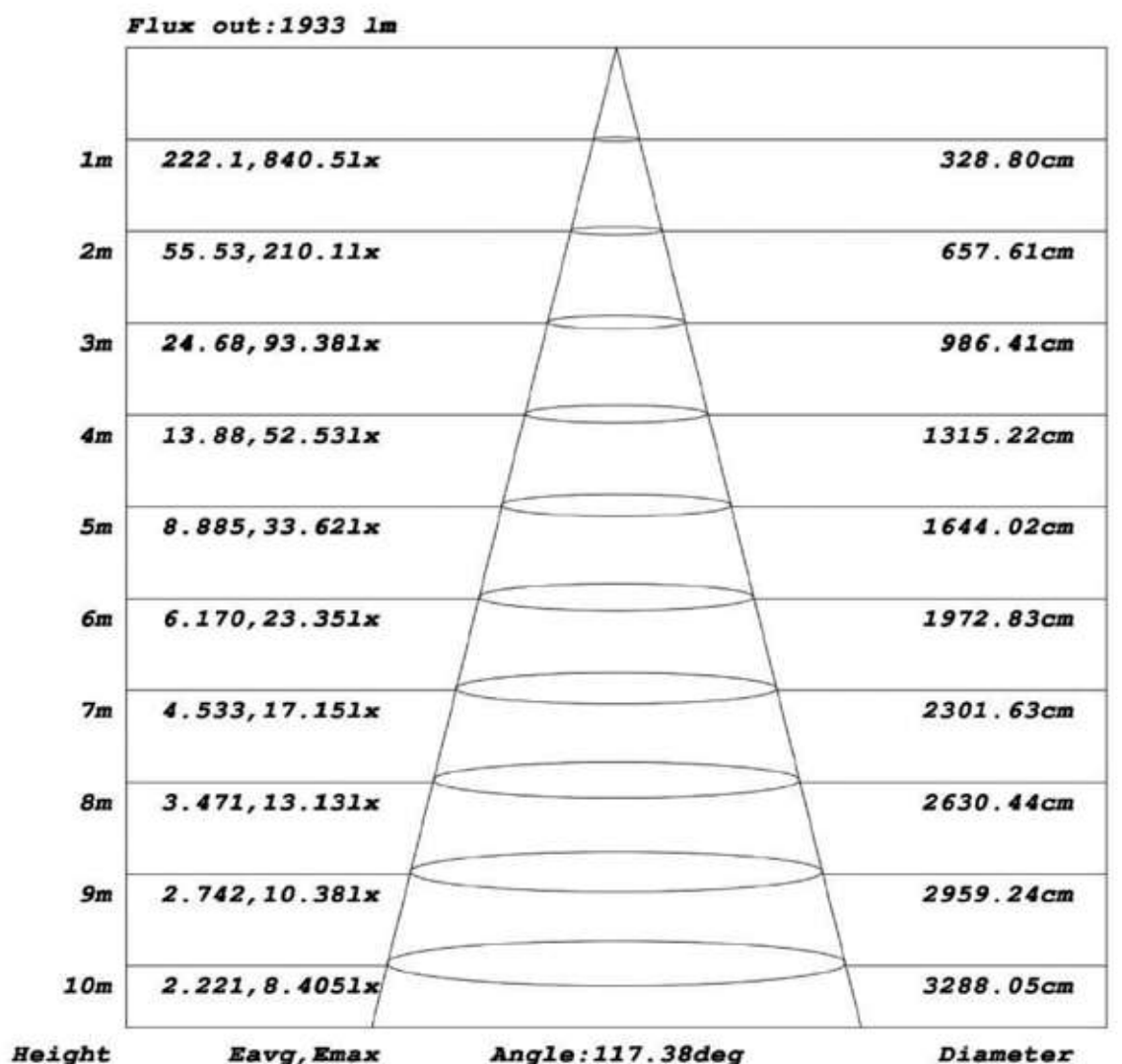


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AAI Figure

NAME: Tira rigida	TYPE: led	WEIGHT: 15
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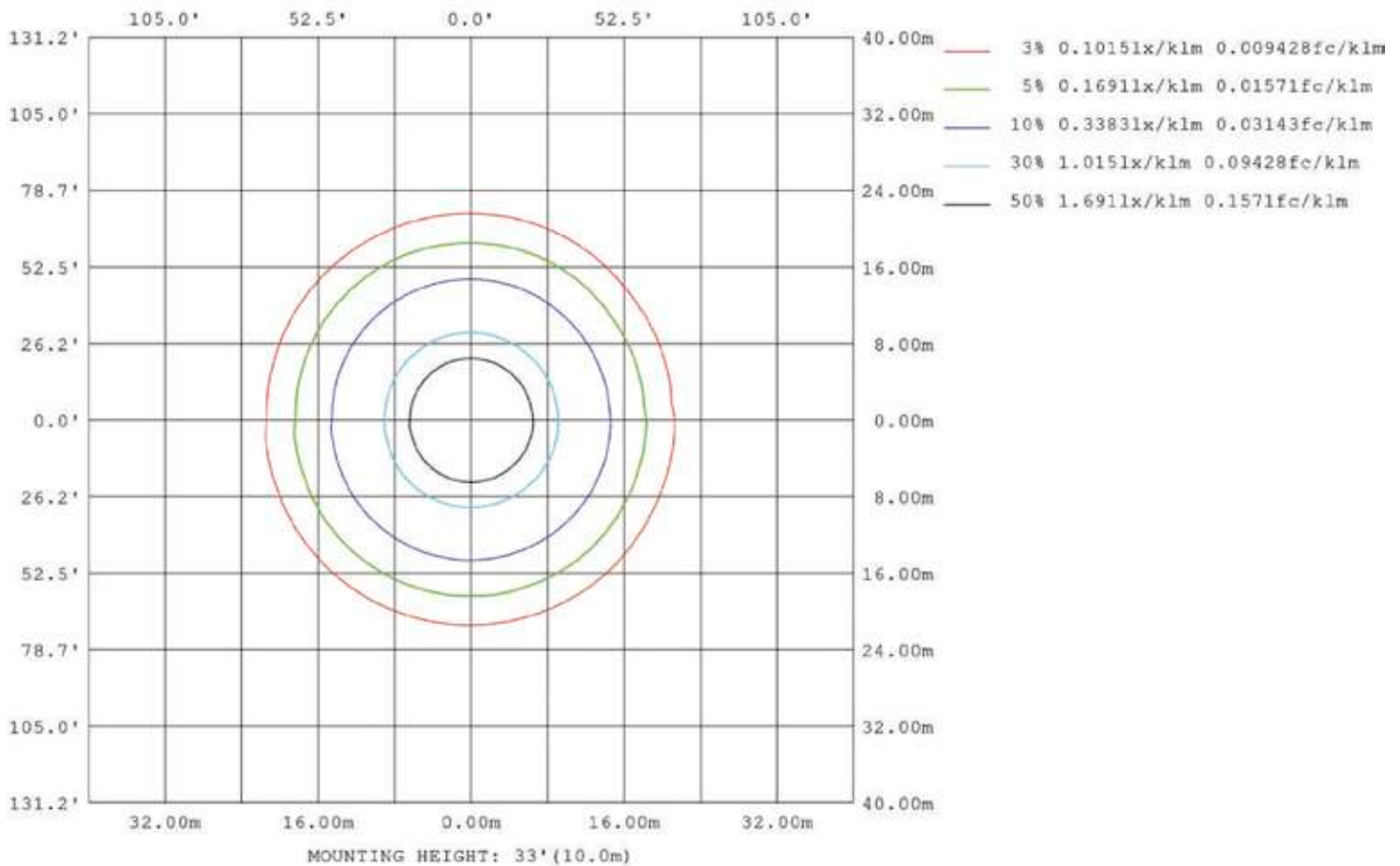
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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 C Interval: 5.0 DEG
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 Operators: Sergio Carneros
 Test Date: 02 May 2017

γ Range: 0 - 110 DEG
 γ Interval: 0.5 DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity: 65.0 %
 Test Distance: 8.200m [K=1.0000]
 Remarks:

ISOLUX DIAGRAM

NAME: Tira rigida	TYPE: led	WEIGHT: 15
SPEC.: 435	DIM.: 560x20x6mm	SERIAL No.: 3234
MFR.: Luz Negra	SUR.: 22	Shielding Angle: 232



C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: MEDIUM
Temperature: 25.3DEG
Operators: Sergio Carneros
Test Date: 02 May 2017

γ Range: 0 - 110DEG
γ Interval: 0.5DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity: 65.0%
Test Distance: 8.200m [K=1.0000]
Remarks:

LED Avg.L Report

NAME: Tira rigida	TYPE:led	WEIGHT:15
SPEC.:435	DIM.: 560x20x6mm	SERIAL No.:3234
MFR.: Luz Negra	SUR.:22	Shielding Angle:232

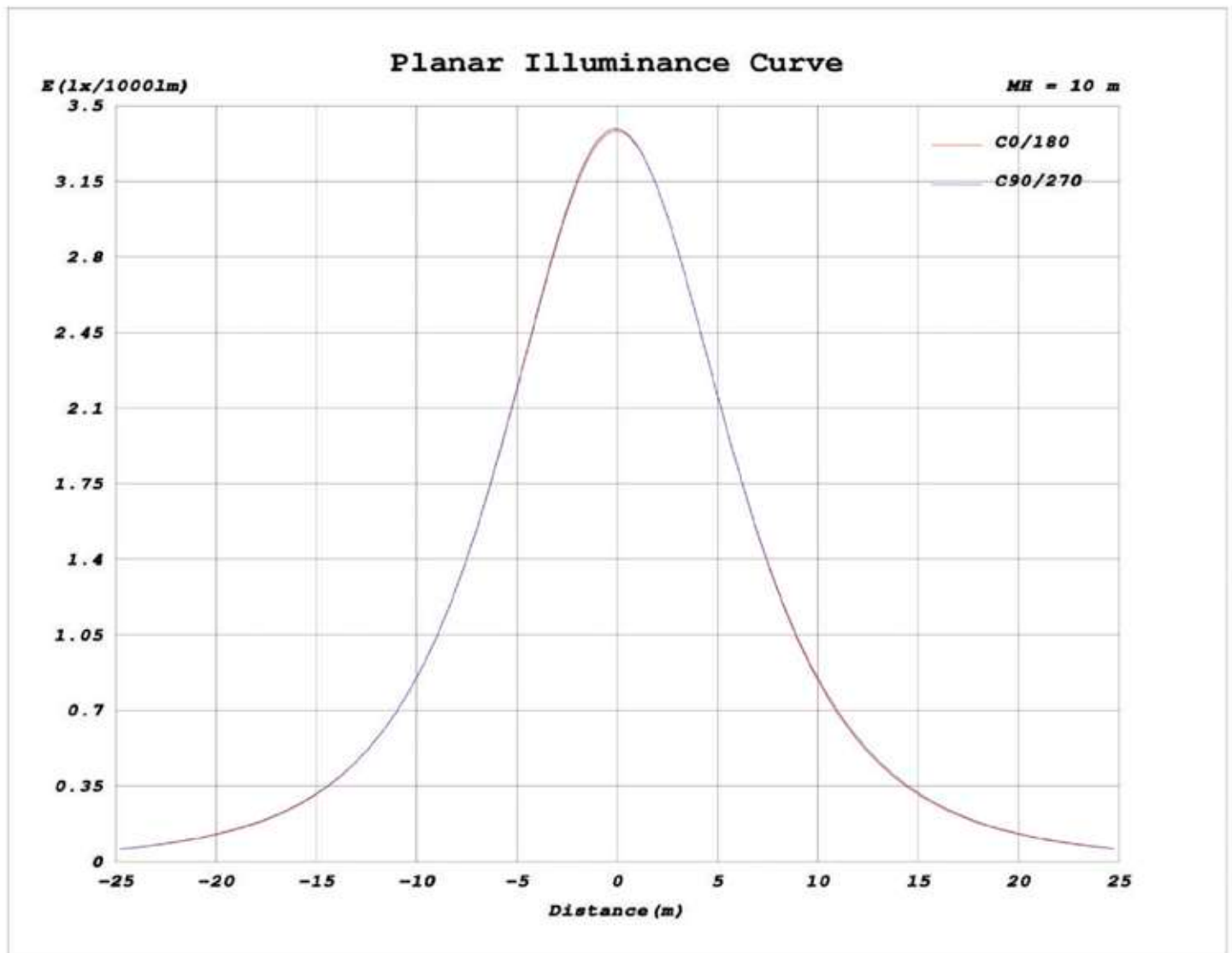
AvgL	cd/m2
L_0~180 (65) av	387
L_0~180 (75) av	329
L_0~180 (85) av	215
L_90~270 (65) av	396
L_90~270 (75) av	343
L_90~270 (85) av	220
L_45 (65) av	394
L_45 (75) av	339
L_45 (85) av	229

Standard: GB/T 29293-2012

C Range: 0 - 360DEG
 C Interval: 5.0DEG
 Test Speed: MEDIUM
 Temperature:25.3DEG
 Operators:Sergio Carneros
 Test Date:02 May 2017

γ Range: 0 - 110DEG
 γ Interval: 0.5DEG
 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity:65.0%
 Test Distance:8.200m [K=1.0000]
 Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: MEDIUM
Temperature: 25.3DEG
Operators: Sergio Carneros
Test Date: 02 May 2017

γ Range: 0 - 110DEG
γ Interval: 0.5DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
Humidity: 65.0%
Test Distance: 8.200m [K=1.0000]
Remarks:

GONIOMETER TEST REPORT
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LUMINOUS DISTRIBUTION INTENSITY DATA

NAME: Tira rigida	TYPE: led	WEIGHT: 15
SPEC.: 435	DIM.: 560x20x6mm	SERIAL No.: 3234
MFR.: Luz Negra	SUR.: 22	Shielding Angle: 232

Table--1

UNIT: cd/klm

C (DEG) Y (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338
5	337	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338
10	334	334	334	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335
15	328	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329
20	320	320	320	321	320	321	320	321	320	321	320	321	320	321	320	321	320	320	320
25	309	310	309	310	310	310	310	310	309	310	309	309	309	310	309	310	309	310	309
30	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296
35	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	279	280	280
40	262	262	262	262	262	262	261	262	261	261	261	261	261	261	261	261	261	262	262
45	241	241	241	241	241	241	240	241	240	240	240	240	240	240	240	240	240	241	241
50	217	218	217	217	217	217	217	217	217	217	217	217	216	217	217	217	217	217	217
55	191	191	190	191	190	191	191	191	191	191	191	191	191	191	191	191	191	192	192
60	161	161	160	161	160	161	161	162	162	163	163	163	163	163	163	163	163	164	164
65	131	131	130	131	130	130	130	131	131	133	133	133	133	133	133	133	133	134	134
70	98.7	99.3	98.7	98.8	97.8	98.2	97.7	99.0	99.4	101	101	101	101	101	101	102	102	103	102
75	65.9	66.2	65.8	66.3	66.4	67.1	66.7	67.0	66.7	66.7	65.9	66.1	65.8	66.2	66.4	68.0	67.6	69.4	70.0
80	37.6	37.8	37.3	37.6	37.1	37.7	37.4	38.0	37.5	37.5	36.9	36.8	36.6	37.1	37.1	37.8	38.4	38.9	38.8
85	14.2	14.4	14.1	14.3	14.0	14.3	14.1	14.4	14.0	14.2	14.0	14.4	14.2	14.4	13.8	14.1	13.4	14.1	14.3
90	1.69	1.78	1.74	1.83	1.80	1.88	1.85	1.91	1.86	1.90	1.84	1.88	1.83	1.86	1.76	1.78	1.45	1.00	0.78
95	0.85	0.86	0.87	0.87	0.88	0.89	0.91	0.92	0.92	0.93	0.93	0.93	0.94	0.93	0.93	0.92	0.85	0.73	0.74
100	1.00	1.01	1.03	1.03	1.04	1.05	1.04	1.02	1.03	1.09	1.13	1.12	1.13	1.11	1.04	0.94	0.93	0.92	0.92
105	1.11	1.10	1.10	1.10	1.10	1.09	1.10	1.10	1.11	1.11	1.13	1.15	1.16	1.13	1.12	1.12	1.12	1.12	1.12
110	1.26	1.26	1.26	1.27	1.28	1.28	1.29	1.29	1.30	1.30	1.31	1.31	1.32	1.32	1.32	1.32	1.32	1.33	1.33
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

C Range: 0 - 360DEG
 C Interval: 5.0DEG
 Test Speed: MEDIUM
 Temperature: 25.3DEG
 Operators: Sergio Carneros
 Test Date: 02 May 2017

Y Range: 0 - 110DEG
 Y Interval: 0.5DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity: 65.0%
 Test Distance: 8.200m [K=1.0000]
 Remarks:

GONIOMETER TEST REPORT
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LUMINOUS DISTRIBUTION INTENSITY DATA

NAME: Tira rigida	TYPE: led	WEIGHT: 15
SPEC.: 435	DIM.: 560x20x6mm	SERIAL No.: 3234
MFR.: Luz Negra	SUR.: 22	Shielding Angle: 232

Table--2

UNIT: cd/klm

C (DEG) Y (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338
5	338	338	338	338	338	338	338	338	338	337	337	337	337	337	337	338	338	337	336
10	335	335	335	335	335	335	335	334	334	334	334	334	333	333	334	334	336	332	332
15	329	329	329	329	329	329	329	329	329	328	328	328	327	327	328	329	330	326	326
20	321	321	321	321	321	321	321	320	320	320	320	319	319	318	319	321	322	317	317
25	310	310	310	310	310	310	310	310	310	309	309	308	308	307	308	310	312	306	305
30	297	296	297	296	297	297	297	297	297	296	296	295	295	294	295	297	298	292	292
35	281	280	281	281	281	281	281	281	281	281	280	280	279	278	279	281	281	276	276
40	262	262	263	262	263	263	263	263	263	262	262	262	261	260	261	261	261	258	258
45	241	241	242	242	242	242	243	242	242	242	242	241	241	240	240	240	239	238	237
50	218	218	218	218	219	219	220	219	220	219	219	219	218	217	217	216	216	215	215
55	192	192	193	193	194	194	194	194	194	194	194	194	194	192	192	192	194	190	190
60	165	164	165	165	166	166	167	166	167	166	167	166	167	166	167	167	168	163	163
65	135	134	135	135	136	136	137	137	137	137	137	137	138	137	139	138	138	134	134
70	103	103	104	104	105	105	106	105	106	106	107	106	107	107	107	107	107	103	104
75	71.1	71.0	71.9	71.9	72.8	72.7	73.6	73.4	74.2	74.1	74.7	74.5	75.1	74.7	75.2	74.5	74.6	71.6	72.2
80	39.5	39.5	40.4	41.1	42.0	42.0	42.7	42.7	43.5	43.4	44.0	43.7	44.2	43.6	44.0	43.4	42.8	41.3	41.8
85	14.8	14.8	15.6	15.7	16.3	16.6	17.5	17.6	18.3	18.2	18.6	18.1	18.3	17.7	18.0	17.1	17.5	16.1	16.3
90	1.12	1.59	2.00	2.03	2.18	2.21	2.42	2.53	2.81	2.85	2.99	2.87	2.90	2.71	2.67	2.45	2.65	2.36	2.36
95	0.73	0.81	0.91	0.95	0.95	0.94	0.91	0.91	0.94	1.01	1.11	1.14	1.16	1.12	1.10	1.21	1.46	1.24	1.24
100	0.92	0.92	0.91	0.98	1.02	1.02	1.01	1.01	1.00	0.99	1.02	1.05	1.07	1.12	1.18	1.31	1.35	1.17	1.17
105	1.12	1.12	1.11	1.10	1.10	1.14	1.16	1.13	1.10	1.10	1.09	1.11	1.14	1.17	1.21	1.22	1.25	1.08	1.08
110	1.33	1.32	1.31	1.30	1.30	1.29	1.29	1.28	1.27	1.27	1.26	1.28	1.30	1.34	1.34	1.35	1.40	1.24	1.24
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

C Range: 0 - 360DEG
 C Interval: 5.0DEG
 Test Speed: MEDIUM
 Temperature: 25.3DEG
 Operators: Sergio Carneros
 Test Date: 02 May 2017

Y Range: 0 - 110DEG
 Y Interval: 0.5DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity: 65.0%
 Test Distance: 8.200m [K=1.0000]
 Remarks:

GONIOMETER TEST REPORT
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LUMINOUS DISTRIBUTION INTENSITY DATA

NAME: Tira rigida	TYPE: led	WEIGHT: 15
SPEC.: 435	DIM.: 560x20x6mm	SERIAL No.: 3234
MFR.: Luz Negra	SUR.: 22	Shielding Angle: 232

Table--3

UNIT: cd/klm

C (DEG) γ (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338
5	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336
10	332	332	332	332	332	332	332	332	332	331	331	331	331	331	331	331	331	331	332
15	326	325	325	325	325	325	325	325	325	325	325	325	325	325	324	324	325	325	325
20	317	317	317	317	317	317	317	316	316	316	316	316	316	316	316	316	316	316	316
25	306	306	306	306	306	306	306	306	306	305	305	305	305	305	305	305	305	305	305
30	292	292	292	292	292	292	293	293	293	292	293	292	292	292	292	291	292	292	292
35	276	276	277	277	277	277	277	277	278	277	278	277	278	277	276	276	276	276	276
40	258	258	259	259	260	260	260	260	261	260	261	261	261	260	259	259	259	259	259
45	238	238	239	239	240	240	240	241	241	241	241	241	241	241	240	240	240	240	239
50	216	216	217	217	218	218	219	219	219	219	220	219	220	219	218	218	218	218	218
55	191	191	193	193	194	194	194	194	195	195	195	195	195	194	194	193	194	193	193
60	164	165	166	166	167	167	168	167	168	168	168	167	168	167	167	166	166	166	166
65	135	136	137	137	138	138	138	138	139	138	139	138	138	137	137	137	137	136	137
70	105	105	106	106	107	107	108	107	108	107	107	107	107	106	106	105	106	105	105
75	73.4	73.7	74.7	74.8	75.4	75.2	75.5	75.1	75.4	75.0	75.2	74.7	74.8	74.1	74.0	73.3	73.4	72.9	72.9
80	42.8	43.1	43.8	43.8	44.4	44.1	44.5	44.1	44.4	44.0	44.3	43.8	43.9	41.8	43.3	42.6	42.7	42.1	42.3
85	17.1	17.3	17.9	17.9	18.3	18.3	18.5	18.4	18.6	18.3	18.4	18.0	18.0	17.5	17.4	16.7	16.6	15.9	16.3
90	2.56	2.68	2.90	2.88	2.98	3.04	2.99	2.87	2.91	2.78	2.80	2.65	2.65	2.46	2.23	1.43	1.01	1.10	1.60
95	1.27	1.33	1.38	1.35	1.30	1.25	1.21	1.17	1.12	1.07	1.01	0.96	0.85	0.72	0.70	0.70	0.70	0.72	0.73
100	1.17	1.20	1.30	1.28	1.23	1.18	1.12	1.02	0.93	0.89	0.88	0.88	0.88	0.90	0.88	0.89	0.88	0.89	0.90
105	1.07	1.07	1.06	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.08	1.08	1.09	1.08	1.09	1.09	1.09	1.09
110	1.24	1.24	1.24	1.25	1.26	1.26	1.27	1.27	1.27	1.27	1.28	1.28	1.29	1.28	1.28	1.29	1.30	1.30	1.30
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

C Range: 0 - 360DEG
 C Interval: 5.0DEG
 Test Speed: MEDIUM
 Temperature: 25.3DEG
 Operators: Sergio Carneros
 Test Date: 02 May 2017

γ Range: 0 - 110DEG
 γ Interval: 0.5DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity: 65.0%
 Test Distance: 8.200m [K=1.0000]
 Remarks:

GONIOMETER TEST REPORT
Page 16 Of 16
LUMINOUS DISTRIBUTION INTENSITY DATA

NAME: Tira rigida	TYPE: led	WEIGHT: 15
SPEC.: 435	DIM.: 560x20x6mm	SERIAL No.: 3234
MFR.: Luz Negra	SUR.: 22	Shielding Angle: 232

Table--4

UNIT: cd/klm

C (DEG) γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338				
5	336	336	336	336	336	336	337	337	337	337	337	337	337	337	337				
10	332	332	332	332	332	332	332	333	333	333	333	333	333	333	333				
15	325	325	325	325	325	326	326	326	326	327	327	327	327	327	326				
20	316	316	316	316	316	317	317	317	317	318	318	318	318	318	318				
25	305	305	305	305	305	305	305	306	306	307	307	307	307	307	307				
30	291	291	291	292	292	292	292	292	292	293	294	294	294	293	292				
35	276	276	276	276	276	276	276	276	276	277	278	278	278	278	277				
40	258	258	258	258	257	258	257	258	258	259	259	260	260	260	260				
45	239	238	238	238	237	237	237	237	237	238	239	240	240	240	239				
50	217	216	215	215	214	214	214	214	213	215	215	216	216	217	215				
55	192	192	191	191	190	189	188	188	187	188	188	189	189	189	188				
60	165	165	164	164	163	162	160	160	158	159	159	160	159	159	157				
65	136	136	135	135	134	132	130	129	128	130	130	130	129	129	125				
70	103	105	104	104	102	100	98.6	98.8	98.2	98.4	97.8	98.3	97.7	90.5	94.3				
75	71.5	71.4	70.8	70.8	69.5	68.9	67.9	68.3	67.7	67.7	67.1	66.7	65.4	66.5	64.9				
80	40.9	40.3	40.1	40.4	39.5	39.4	38.8	39.1	37.3	35.2	36.4	36.3	36.5	35.9	36.1				
85	15.8	15.6	15.2	15.5	15.1	14.0	13.6	14.1	13.8	13.4	12.8	12.9	13.1	13.3	12.9				
90	1.71	1.79	1.76	1.77	1.69	1.70	1.65	1.70	1.59	1.60	1.52	1.53	1.47	1.44	1.39				
95	0.73	0.73	0.73	0.72	0.72	0.71	0.72	0.73	0.74	0.73	0.73	0.73	0.73	0.74	0.76				
100	0.91	0.91	0.91	0.90	0.90	0.90	0.92	0.92	0.93	0.93	0.93	0.91	0.92	0.91	0.92				
105	1.09	1.09	1.10	1.09	1.09	1.09	1.09	1.10	1.11	1.11	1.12	1.11	1.11	1.10	1.11				
110	1.30	1.29	1.29	1.29	1.29	1.28	1.28	1.28	1.28	1.29	1.30	1.31	1.31	1.31	1.31				
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				

C Range: 0 - 360DEG
 C Interval: 5.0DEG
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 Temperature: 25.3DEG
 Operators: Sergio Carneros
 Test Date: 02 May 2017

γ Range: 0 - 110DEG
 γ Interval: 0.5DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.400
 Humidity: 65.0%
 Test Distance: 8.200m [K=1.0000]
 Remarks: