

LED Downlight FUSION Series FA5-11W-940-24D



Light Output Ratio:	100.0%	
Luminaire Power:	12.36 W	
SHR Nominal:	0.00	Calculated using the TM5
SHR Maximum:	1.00	fine grid method.

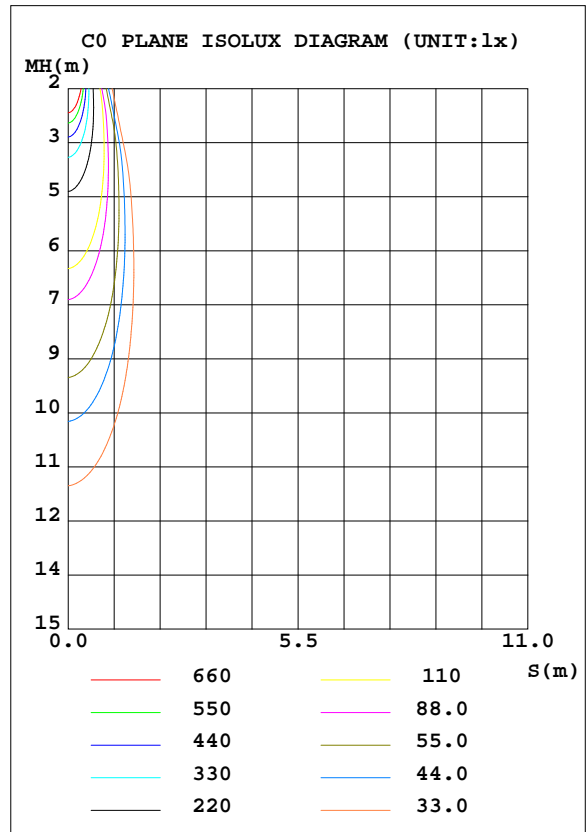
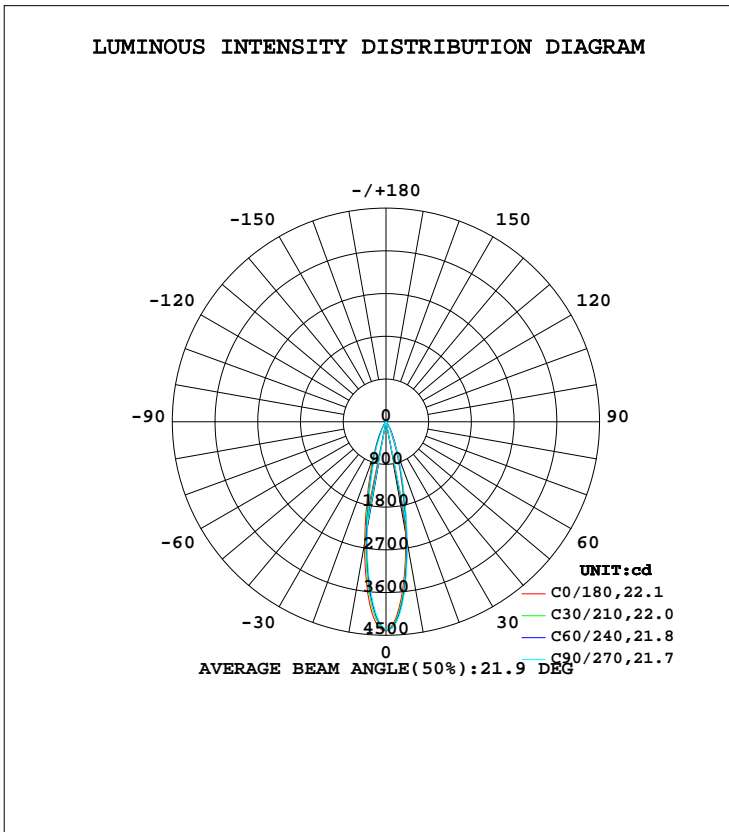
C Range: 0 - 360DEG  
C Interval: 15.0DEG  
Test Speed: HIGH  
Temperature: 25.3DEG  
Operators: Myles  
Test Date: 2018-06-08

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
Test System: EVERFINE GO-2000B\_V1 SYSTEM V2.0.362  
Humidity: 56%  
Test Distance: 5.850m [K=1.0000]  
Remarks:

**LUMINAIRE PHOTOMETRIC TEST REPORT**

Test:U:220.8V I:0.0652A P:12.36W PF:0.9032 Freq:49.90Hz Lamp Flux:910.316x1 lm		
NAME: FA5-11W-940-24D	TYPE:Downlight	SERIAL No.:
SPEC.:4000K	DIM.: L153mm*W45mm*H60mm	
MFR.: NEKO LIGHTING AG		

DATA OF LAMP		PHOTOMETRIC DATA			
MODEL	OSRAM-4000K	Imax(cd)	4404	S/MH(C0/180)	0.39
NOMINAL POWER(W)	13	LOR(%)	100.0	S/MH(C90/270)	0.35
RATED VOLTAGE(V)	220	TOTAL FLUX(lm)	910.32	η UP, DN(C0-180)	0.0,51.8
NOMINAL FLUX(lm)	910.316	CIE CLASS	DIRECT	η UP, DN(C180-360)	0.0,48.2
LAMPS INSIDE	1	η up(%)	0.0	CIBSE SHR NOM	0.00
TEST VOLTAGE(V)	220	η down(%)	100.0	CIBSE SHR MAX	1.00



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Remarks:

**ZONAL FLUX DIAGRAM**

ZONAL FLUX DIAGRAM:

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	%lum,lamp
10	2383	2539	2575	2620	2593	2350	2277	2286	0- 10	315.6	315.6	34.7,34.7
20	617.4	702.7	708.1	778.1	761.5	692.1	625.2	636.7	10- 20	371.9	687.5	75.5,75.5
30	142.4	215.2	150.5	243.0	144.0	215.2	134.9	198.7	20- 30	166.6	854.1	93.8,93.8
40	9.236	44.26	13.20	42.19	12.85	34.20	10.77	37.58	30- 40	50.38	904.5	99.4,99.4
50	0.4467	3.042	0.4356	3.250	0.4214	1.631	0.3582	1.644	40- 50	5.428	909.9	100,100
60	0.1576	0.0917	0.1751	0.0961	0.1420	0.1094	0.1355	0.1094	50- 60	0.2301	910.2	100,100
70	0.0678	0.0372	0.0809	0.0393	0.0502	0.0612	0.0524	0.0569	60- 70	0.0847	910.2	100,100
80	0.0372	0.0372	0.0481	0.0350	0.0262	0.0372	0.0328	0.0328	70- 80	0.0458	910.3	100,100
90	0.0350	0.0350	0.0350	0.0350	0.0219	0.0219	0.0219	0.0219	80- 90	0.0336	910.3	100,100
100									90-100			
110									100-110			
120									110-120			
130									120-130			
140									130-140			
150									140-150			
160									150-160			
170									160-170			
180									170-180			
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Conical surface Flux(90deg): 909.01 lm

%lum = 99.9%

%lamp = 99.9%

Conical surface Flux(120deg): 910.15 lm

%lum = 100.0%

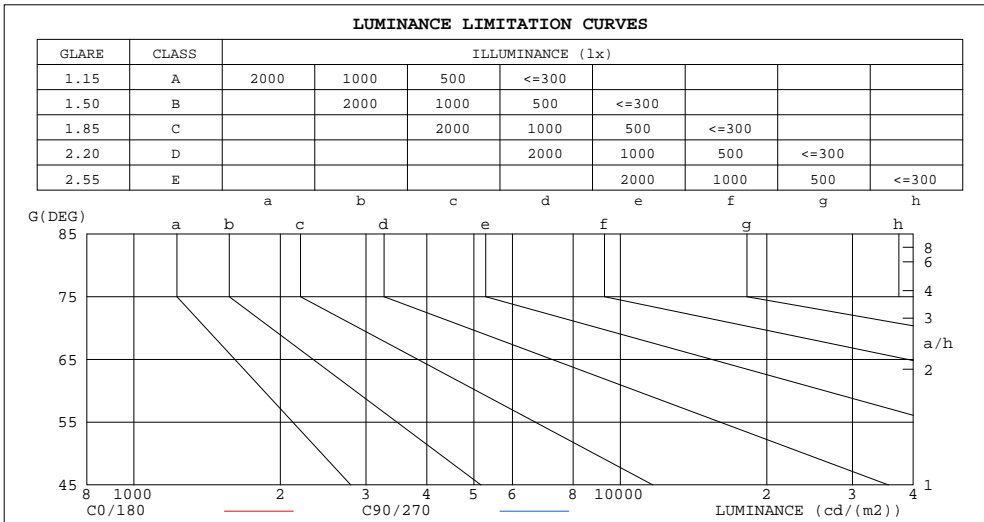
%lamp = 100.0%

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Test System:EVERFINE GO-2000B\_V1 SYSTEM V2.0.362  
Humidity:56%  
Test Distance:5.850m [K=1.0000]  
Remarks:

**LUMINANCE LIMITATION CURVES**

Test:U:220.8V I:0.0652A P:12.36W PF:0.9032 Freq:49.90Hz Lamp Flux:910.316x1 lm		
NAME: FA5-11W-940-24D	TYPE:Downlight	SERIAL No.:
SPEC.:4000K	DIM.: L153mm*W45mm*H60mm	
MFR.: NEKO LIGHTING AG		



LUMINANCE cd/(m2)		
G(DEG)	C0/180	C90/270
85	55	66
80	31	40
75	27	34
70	29	34
65	33	41
60	46	51
55	64	70
50	101	98
45	181	396

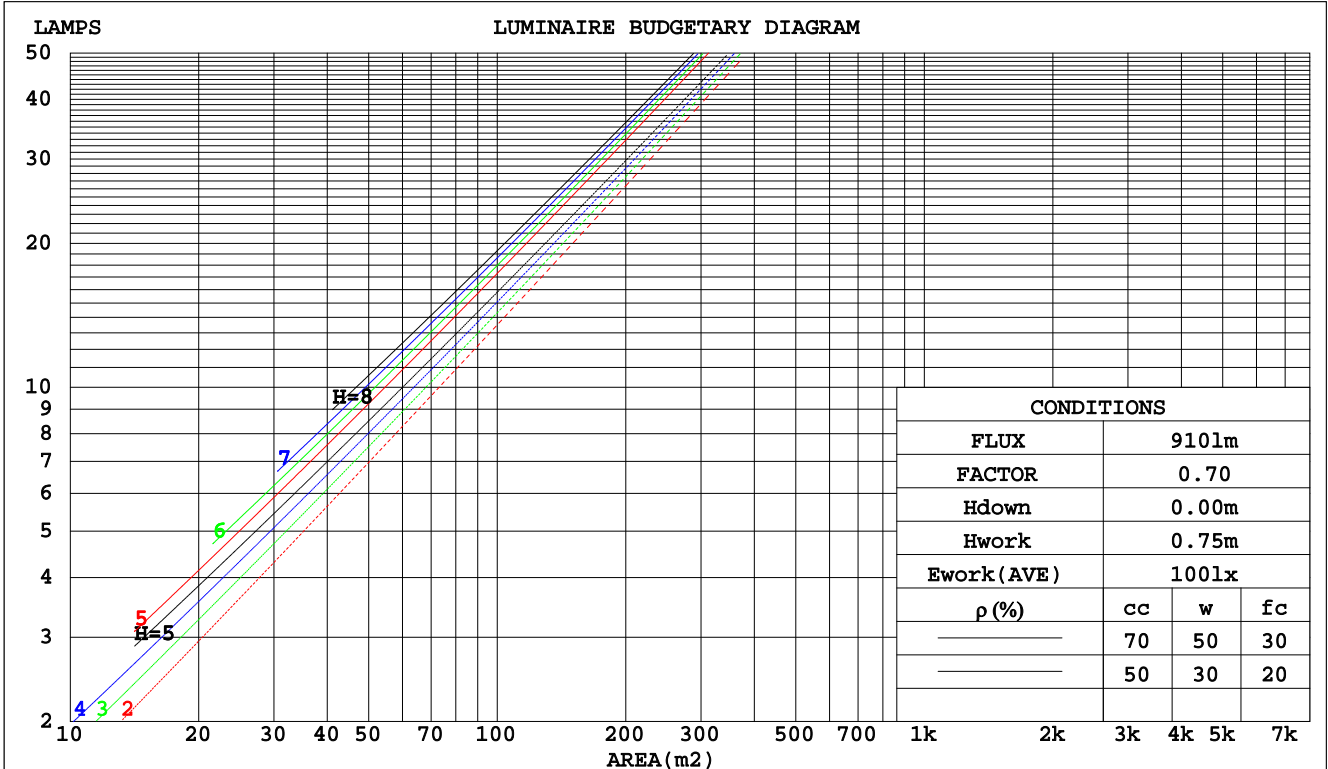
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**CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM**

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pcc	80%			70%			50%			30%			10%			0
	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pw																0
pfc	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	1.00
1.0	1.13	1.11	1.09	1.11	1.09	1.07	1.07	1.05	1.04	1.03	1.02	1.01	.00	.99	.98	.97
2.0	1.07	1.04	1.02	1.06	1.03	1.01	1.03	1.00	.99	.00	.98	.97	.97	.96	.95	.93
3.0	1.03	.99	.96	1.01	.98	.95	.99	.96	.94	.97	.94	.93	.95	.93	.91	.90
4.0	.99	.95	.92	.98	.94	.91	.96	.92	.90	.94	.91	.89	.92	.90	.88	.87
5.0	.95	.91	.88	.94	.90	.87	.92	.89	.87	.91	.88	.86	.90	.87	.85	.84
6.0	.91	.87	.84	.91	.87	.84	.89	.86	.83	.88	.85	.83	.87	.84	.82	.81
7.0	.88	.84	.81	.88	.84	.81	.87	.83	.81	.86	.83	.80	.85	.82	.80	.79
8.0	.86	.81	.78	.85	.81	.78	.84	.81	.78	.83	.80	.78	.82	.80	.77	.76
9.0	.83	.79	.76	.83	.79	.76	.82	.78	.76	.81	.78	.75	.80	.77	.75	.74
10.0	.81	.76	.74	.80	.76	.74	.79	.76	.73	.79	.76	.73	.78	.75	.73	.72



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WEC AND CCEC

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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	.138	.079	.025	.132	.075	.024	.119	.068	.022	.108	.062	.020	.097	.056	.018	
2.0	.128	.070	.022	.123	.068	.021	.113	.063	.019	.103	.058	.018	.095	.054	.017	
3.0	.120	.064	.019	.115	.062	.019	.107	.058	.018	.099	.054	.017	.092	.051	.016	
4.0	.113	.059	.017	.109	.057	.017	.102	.054	.016	.095	.051	.015	.089	.048	.015	
5.0	.106	.054	.016	.103	.053	.015	.097	.051	.015	.091	.048	.014	.086	.046	.014	
6.0	.101	.051	.014	.098	.050	.014	.093	.048	.014	.088	.046	.013	.083	.044	.013	
7.0	.096	.047	.013	.094	.047	.013	.089	.045	.013	.085	.043	.013	.081	.042	.012	
8.0	.092	.045	.013	.089	.044	.012	.085	.043	.012	.082	.041	.012	.078	.040	.012	
9.0	.088	.042	.012	.086	.042	.012	.082	.041	.012	.079	.039	.011	.076	.038	.011	
10.0	.084	.040	.011	.082	.040	.011	.079	.039	.011	.076	.038	.011	.073	.037	.011	

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	.168	.158	.148	.144	.135	.127	.099	.093	.088	.057	.054	.051	.018	.017	.017	
2.0	.150	.133	.118	.129	.114	.102	.088	.079	.071	.051	.046	.042	.016	.015	.014	
3.0	.136	.113	.096	.116	.098	.083	.080	.068	.058	.046	.040	.034	.015	.013	.011	
4.0	.123	.098	.079	.106	.085	.068	.073	.059	.048	.042	.035	.028	.014	.011	.009	
5.0	.113	.086	.066	.097	.074	.057	.067	.052	.040	.039	.030	.024	.012	.010	.008	
6.0	.104	.076	.055	.089	.066	.048	.062	.046	.034	.036	.027	.020	.012	.009	.007	
7.0	.097	.068	.047	.083	.059	.041	.057	.041	.029	.033	.024	.017	.011	.008	.006	
8.0	.090	.061	.041	.078	.053	.035	.054	.037	.025	.031	.022	.015	.010	.007	.005	
9.0	.085	.055	.035	.073	.048	.031	.050	.034	.022	.029	.020	.013	.010	.007	.004	
10.0	.080	.050	.031	.069	.044	.027	.048	.031	.019	.028	.018	.011	.009	.006	.004	

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 C Interval: 15.0DEG  
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γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000B\_V1 SYSTEM V2.0.362  
 Humidity:56%  
 Test Distance:5.850m [K=1.0000]  
 Remarks:

UGR(Unified Glare Rating) Table

Test:U:220.8V I:0.0652A P:12.36W PF:0.9032 Freq:49.90Hz Lamp Flux:910.316x1 lm		
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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	8.6	8.2	8.8	8.9	8.4	9.0	8.6	9.2	9.4
3H	7.8	8.4	8.1	8.6	8.8	8.2	8.9	8.5	9.0	9.2
4H	7.7	8.3	8.0	8.5	8.7	8.2	8.7	8.4	9.0	9.2
6H	7.6	8.2	7.9	8.4	8.7	8.1	8.6	8.4	8.9	9.1
8H	7.6	8.1	7.9	8.4	8.6	8.0	8.6	8.3	8.8	9.1
12H	7.6	8.1	7.9	8.3	8.6	8.0	8.5	8.3	8.8	9.0
4H 2H	7.7	8.3	8.0	8.5	8.7	8.2	8.7	8.4	9.0	9.2
3H	7.6	8.1	7.9	8.3	8.6	8.0	8.5	8.3	8.8	9.0
4H	7.5	7.9	7.8	8.2	8.5	7.9	8.4	8.2	8.7	9.0
6H	7.4	7.8	7.7	8.1	8.4	7.8	8.2	8.2	8.5	8.9
8H	7.3	7.7	7.7	8.0	8.4	7.7	8.1	8.1	8.5	8.8
12H	7.3	7.6	7.7	8.0	8.4	7.7	8.0	8.1	8.4	8.8
8H 4H	7.3	7.7	7.7	8.0	8.4	7.7	8.1	8.1	8.5	8.8
6H	7.2	7.5	7.6	7.9	8.3	7.6	7.9	8.0	8.3	8.7
8H	7.1	7.4	7.6	7.8	8.3	7.6	7.8	8.0	8.3	8.7
12H	7.1	7.3	7.5	7.8	8.2	7.5	7.7	8.0	8.2	8.6
12H 4H	7.3	7.6	7.7	8.0	8.4	7.7	8.0	8.1	8.4	8.8
6H	7.1	7.4	7.6	7.8	8.3	7.6	7.8	8.0	8.3	8.7
8H	7.1	7.3	7.5	7.8	8.2	7.5	7.7	8.0	8.2	8.6
Variations with the observer position at spacings:										
S = 1.0H	+ 2.8 / -20.4					+ 3.8 / -22.2				
1.5H	+ 5.7 / -19.3					+ 6.6 / -21.6				
2.0H	+ 4.1 / - 2.9					+ 6.5 / - 5.4				

CIE Pub.117, 910.3 lm Total Lamp Luminous Flux Correct (8log(F/F0) = -0.3)

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 Test System:EVERFINE GO-2000B\_V1 SYSTEM V2.0.362  
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**UTILIZATION FACTORS TABLE**

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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	91	86	82	91	85	82	90	85	82	79
0.80	98	93	90	97	93	90	96	92	89	86
1.00	102	97	94	101	96	93	100	96	93	89
1.25	105	101	98	104	100	97	102	99	96	93
1.50	108	104	101	107	103	100	104	101	99	95
2.00	110	106	103	109	105	103	106	103	101	96
2.50	111	108	105	110	107	104	107	104	102	97
3.00	113	110	107	111	108	106	108	106	104	98
4.00	115	112	110	113	110	109	109	107	106	99
5.00	116	114	112	114	112	111	110	109	107	100
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			

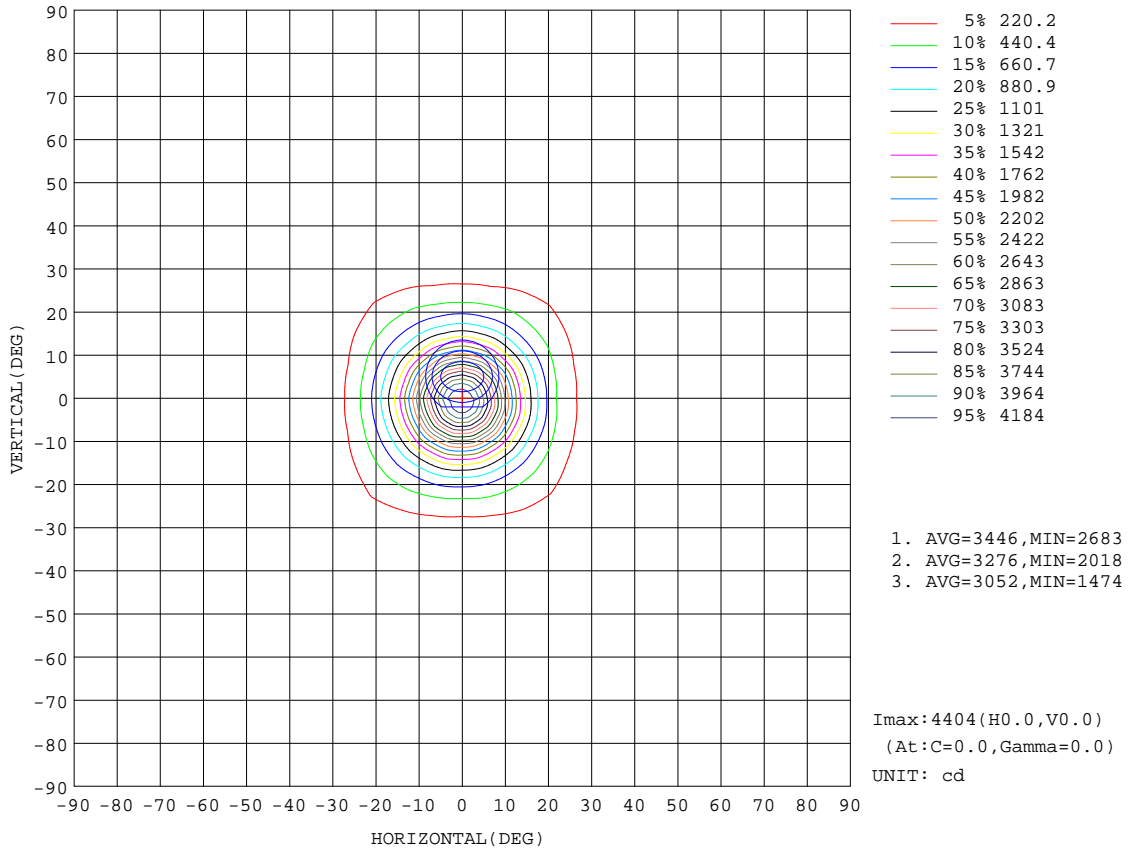
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ISOCANDELA DIAGRAM

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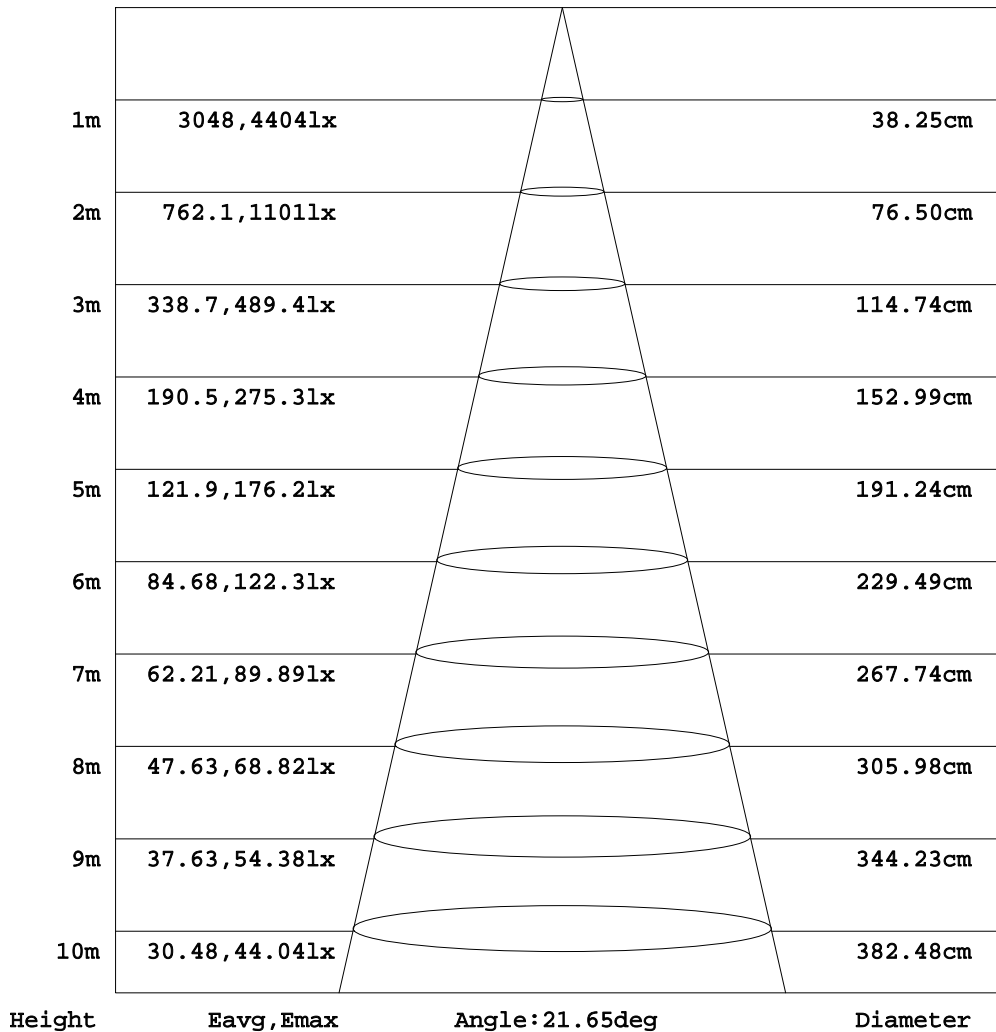
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**AAI Figure**

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Flux out:361.9 lm



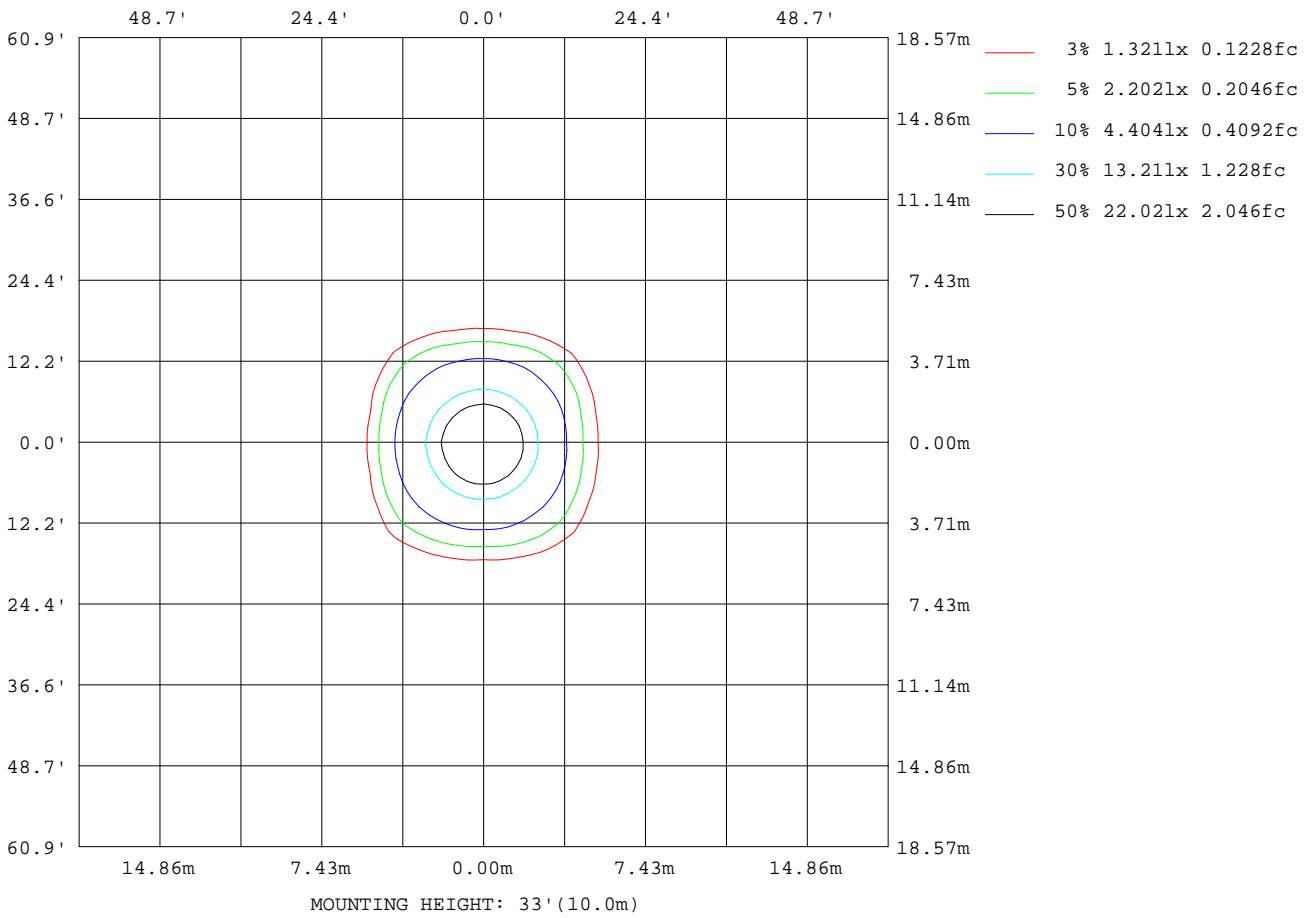
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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**ISOLUX DIAGRAM**

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LED Avg.L Report

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SPEC.:4000K	DIM.: L153mm*W45mm*H60mm	
MFR.: NEKO LIGHTING AG		

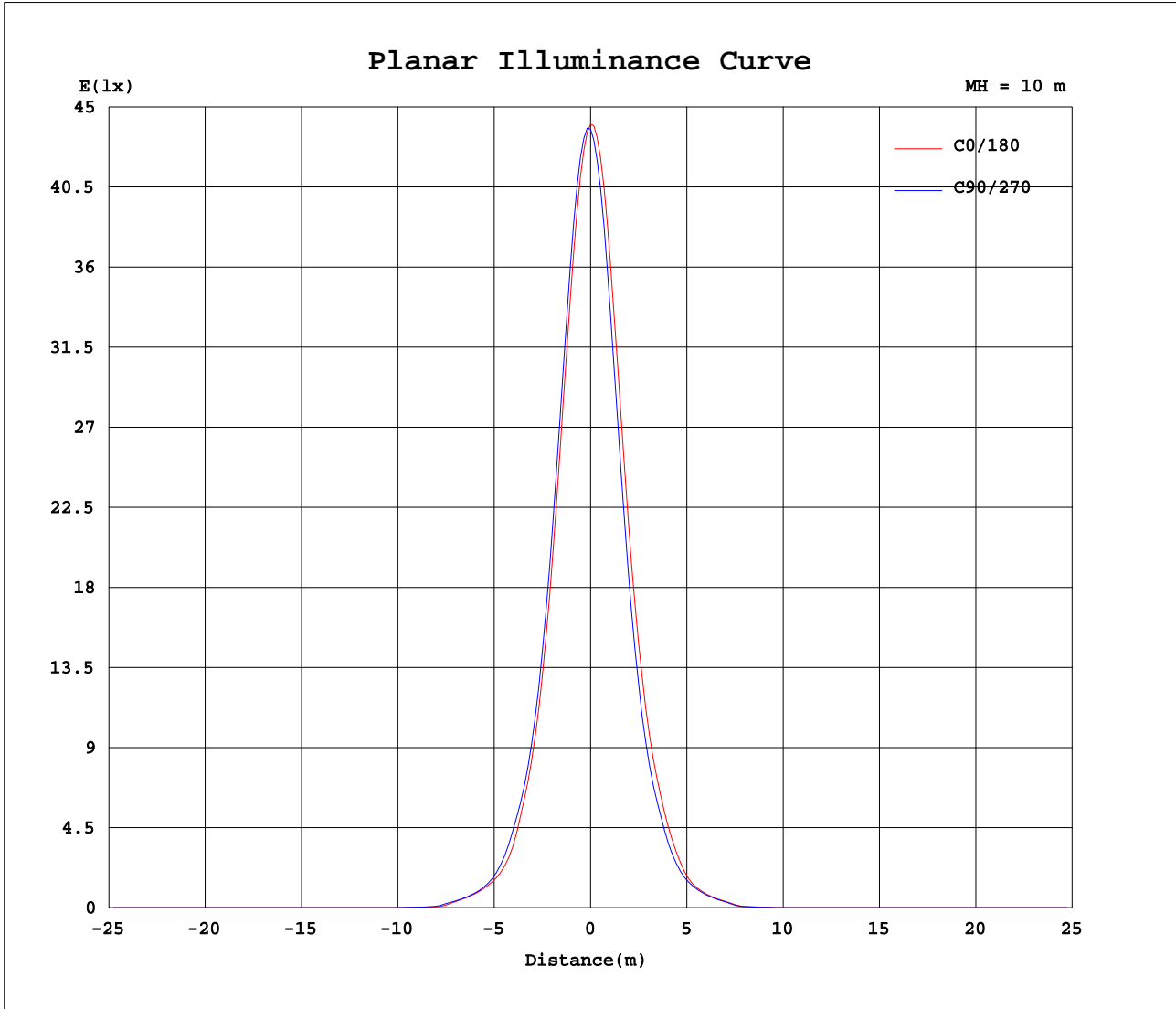
AvgL	cd/m2
L_0~180(65)av	31
L_0~180(75)av	23
L_0~180(85)av	46
L_90~270(65)av	35
L_90~270(75)av	28
L_90~270(85)av	53
L_45(65)av	23
L_45(75)av	22
L_45(85)av	52

Standard: GB/T 29293-2012

C Range: 0 - 360DEG  
C Interval: 15.0DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:Myles  
Test Date:2018-06-08

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
Test System:EVERFINE GO-2000B\_V1 SYSTEM V2.0.362  
Humidity:56%  
Test Distance:5.850m [K=1.0000]  
Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG  
 C Interval: 15.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators: Myles  
 Test Date: 2018-06-08

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System: EVERFINE GO-2000B\_V1 SYSTEM V2.0.362  
 Humidity: 56%  
 Test Distance: 5.850m [K=1.0000]  
 Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:220.8V I:0.0652A P:12.36W PF:0.9032 Freq:49.90Hz Lamp Flux:910.316x1 lm		
NAME: FA5-11W-940-24D	TYPE:Downlight	SERIAL No.:
SPEC.:4000K	DIM.: L153mm*W45mm*H60mm	
MFR.: NEKO LIGHTING AG		

Table--1

UNIT: cd

C( DEG) γ (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	4404	4399	4393	4386	4384	4376	4375	4365	4365	4356	4355	4349	4404	4399	4393	4386	4384	4376	4375
5	3720	3785	3792	3853	3854	3903	3889	3921	3885	3889	3837	3830	3883	3798	3769	3689	3676	3614	3623
10	2383	2459	2466	2539	2533	2596	2575	2623	2592	2620	2562	2555	2593	2483	2450	2350	2334	2259	2277
15	1249	1303	1308	1357	1355	1406	1384	1441	1421	1464	1417	1428	1447	1356	1334	1265	1243	1190	1197
20	617	656	672	703	702	716	708	735	749	778	764	755	761	731	727	692	670	635	625
25	268	291	339	381	381	355	326	354	409	435	410	360	344	352	394	397	364	297	277
30	142	152	173	215	194	163	150	165	196	243	184	148	144	144	180	215	172	140	135
35	63.7	73.2	86.5	106	91.8	78.6	71.3	78.4	88.6	106	79.8	67.6	65.7	65.4	75.5	89.4	77.8	64.5	60.8
40	9.24	11.5	27.3	44.3	36.2	15.2	13.2	15.7	35.7	42.2	28.0	13.7	12.9	13.3	23.5	34.2	25.9	12.5	10.8
45	0.88	2.27	6.25	12.7	7.46	4.52	1.93	5.03	8.08	13.5	8.29	2.53	0.84	1.60	7.47	9.05	6.60	1.12	0.64
50	0.45	0.43	0.45	3.04	0.41	0.39	0.44	0.39	0.40	3.25	0.42	0.40	0.42	0.42	0.38	1.63	0.31	0.36	0.36
55	0.25	0.23	0.23	0.16	0.23	0.23	0.28	0.23	0.23	0.16	0.22	0.23	0.24	0.25	0.20	0.17	0.19	0.22	0.22
60	0.16	0.13	0.13	0.09	0.14	0.14	0.18	0.14	0.14	0.10	0.14	0.13	0.14	0.15	0.11	0.11	0.10	0.15	0.14
65	0.10	0.07	0.09	0.06	0.09	0.08	0.12	0.09	0.09	0.06	0.09	0.08	0.09	0.10	0.07	0.08	0.07	0.10	0.08
70	0.07	0.04	0.06	0.04	0.07	0.06	0.08	0.06	0.07	0.04	0.07	0.05	0.05	0.07	0.04	0.06	0.04	0.07	0.05
75	0.05	0.04	0.05	0.04	0.05	0.04	0.06	0.04	0.05	0.03	0.05	0.04	0.03	0.05	0.03	0.04	0.03	0.05	0.04
80	0.04	0.03	0.04	0.04	0.04	0.04	0.05	0.03	0.04	0.03	0.04	0.03	0.03	0.04	0.03	0.04	0.03	0.04	0.03
85	0.03	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02
90	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02

C Range: 0 - 360DEG  
 C Interval: 15.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:Myles  
 Test Date:2018-06-08

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000B\_V1 SYSTEM V2.0.362  
 Humidity:56%  
 Test Distance:5.850m [K=1.0000]  
 Remarks:

**LUMINOUS DISTRIBUTION INTENSITY DATA**

Test:U:220.8V I:0.0652A P:12.36W PF:0.9032 Freq:49.90Hz Lamp Flux:910.316x1 lm		
NAME: FA5-11W-940-24D	TYPE:Downlight	SERIAL No.:
SPEC.:4000K	DIM.: L153mm*W45mm*H60mm	
MFR.: NEKO LIGHTING AG		

Table--2

UNIT: cd

C(DEG)\γ (DEG)	285	300	315	330	345														
0	4365	4365	4356	4355	4349														
5	3586	3624	3608	3663	3666														
10	2239	2295	2286	2353	2350														
15	1176	1210	1205	1241	1233														
20	622	637	637	640	630														
25	289	340	355	338	287														
30	137	164	199	171	149														
35	63.1	76.6	90.5	83.9	71.4														
40	11.8	22.5	37.6	28.7	11.2														
45	0.89	5.73	9.07	6.43	2.14														
50	0.35	0.30	1.64	0.38	0.42														
55	0.22	0.18	0.16	0.19	0.24														
60	0.14	0.10	0.11	0.10	0.14														
65	0.10	0.06	0.07	0.07	0.09														
70	0.07	0.04	0.06	0.04	0.06														
75	0.05	0.03	0.04	0.03	0.05														
80	0.04	0.02	0.03	0.02	0.04														
85	0.03	0.02	0.03	0.02	0.03														
90	0.02	0.02	0.02	0.02	0.02														

C Range: 0 - 360DEG  
 C Interval: 15.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators: Myles  
 Test Date: 2018-06-08

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System: EVERFINE GO-2000B\_V1 SYSTEM V2.0.362  
 Humidity: 56%  
 Test Distance: 5.850m [K=1.0000]  
 Remarks: