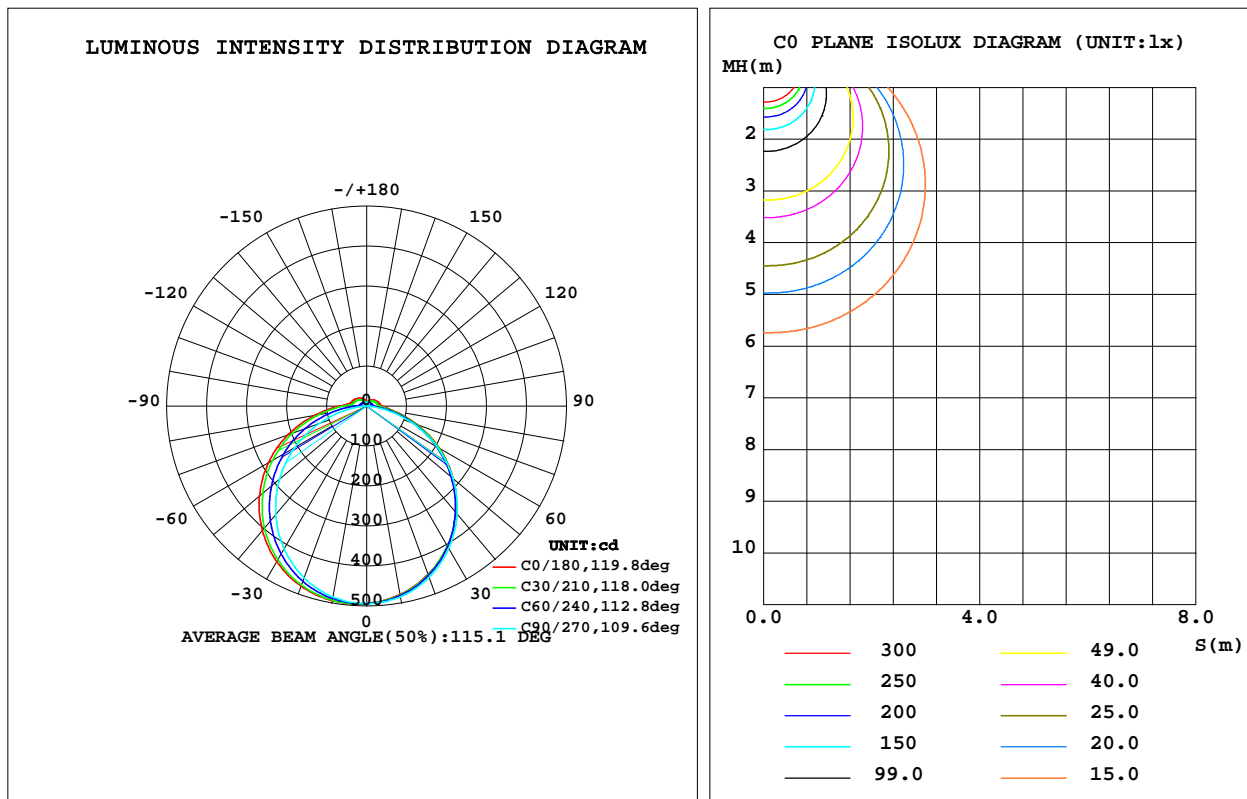


LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:230.4V I:0.0660A P:14.10W PF:0.9170 Lamp Flux:1603.52x1 lm		
NAME: 136-305_15W_4000K	TYPE:15W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0708	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 113.72 lm/W			
MODEL	136-305_15W_4000K	I _{max} (cd)	495.7	S/MH(C0/180)	1.35
NOMINAL POWER(W)	15	LOR(%)	100.0	S/MH(C90/270)	1.24
RATED VOLTAGE(V)	230	TOTAL FLUX(lm)	1603.5	η UP, DN(C0-180)	3.7, 47.6
NOMINAL FLUX(lm)	1603.52	CIE CLASS	DIRECT	η UP, DN(C180-360)	3.4, 45.2
LAMPS INSIDE	1	η up(%)	7.1	CIBSE SHR NOM	1.25
TEST VOLTAGE(V)	230.4	η down(%)	92.9	CIBSE SHR MAX	1.35



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.600m [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	493.9	490.9	485.1	480.6	478.3	480.6	484.6	490.6	0- 10	46.75	46.75	2.92,2.92
20	479.5	471.6	457.3	451.0	448.2	449.9	456.2	470.4	10- 20	134.1	180.9	11.3,11.3
30	449.9	435.9	412.8	405.9	404.3	404.7	410.8	434.0	20- 30	203.7	384.6	24,24
40	406.1	386.4	353.7	347.9	347.6	345.8	352.3	383.7	30- 40	246.7	631.3	39.4,39.4
50	350.2	325.2	284.8	281.0	282.7	278.4	282.4	322.5	40- 50	258.1	889.3	55.5,55.5
60	283.9	255.9	207.6	207.1	209.8	204.4	203.6	253.2	50- 60	237.6	1127	70.3,70.3
70	209.6	180.0	124.7	129.6	133.1	126.8	118.5	177.3	60- 70	188.2	1315	82,82
80	131.1	102.8	44.82	59.51	68.03	57.24	38.51	99.64	70- 80	119.1	1434	89.4,89.4
90	68.75	43.40	1.141	25.09	38.05	24.49	0.4798	41.18	80- 90	54.73	1489	92.9,92.9
100	43.03	26.85	1.071	20.96	33.02	20.81	1.180	24.80	90-100	27.69	1517	94.6,94.6
110	38.23	24.30	2.586	18.90	30.04	18.98	2.658	23.66	100-110	22.45	1539	96,96
120	34.47	21.89	3.848	16.94	26.67	17.16	4.013	21.81	110-120	19.47	1559	97.2,97.2
130	30.24	19.05	4.849	15.10	23.01	15.33	5.028	17.39	120-130	15.79	1574	98.2,98.2
140	25.88	15.62	5.703	13.25	19.23	13.39	5.893	15.77	130-140	12.02	1586	98.9,98.9
150	21.49	12.24	6.341	11.40	15.48	11.37	6.562	12.62	140-150	8.337	1595	99.5,99.5
160	17.13	9.770	7.287	9.783	11.73	9.751	7.366	10.27	150-160	5.170	1600	99.8,99.8
170	12.86	8.544	8.480	8.891	8.833	8.809	8.590	8.796	160-170	2.731	1603	99.9,99.9
180	8.096	8.437	9.321	8.647	8.077	8.447	9.308	8.637	170-180	0.8419	1604	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

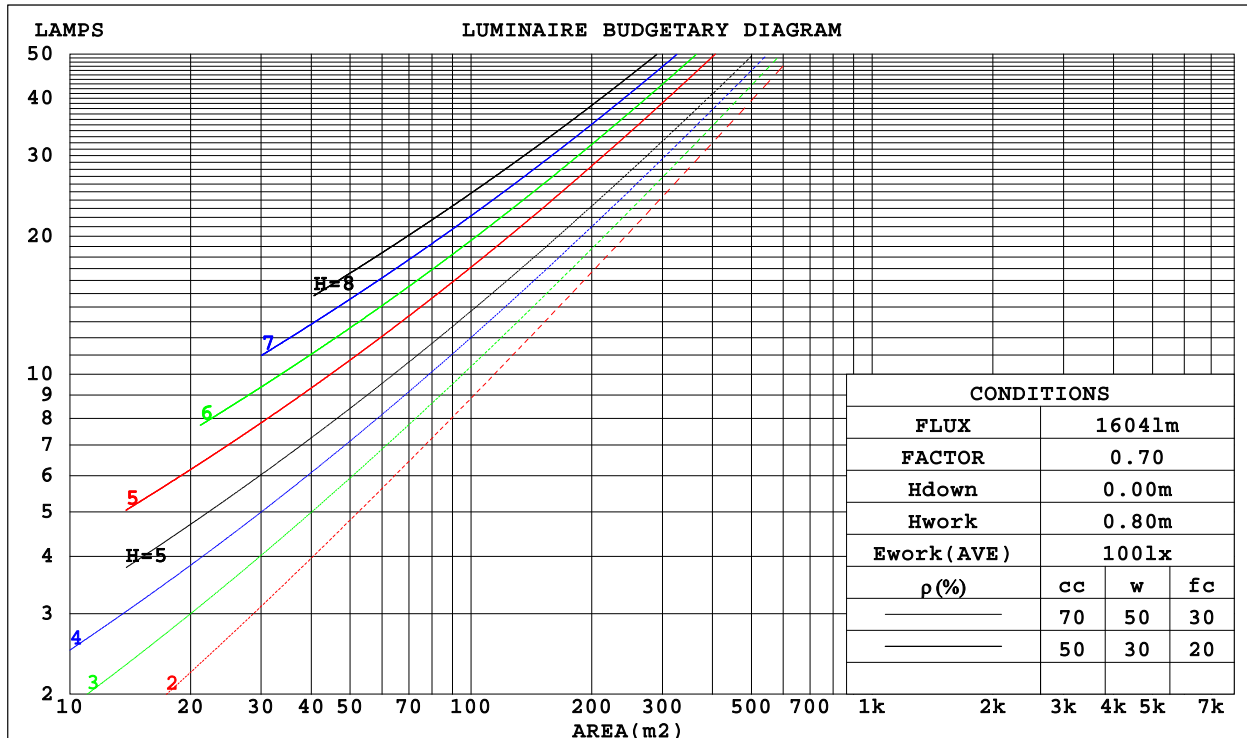
C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.600m [K=1.0000]
 Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:230.4V I:0.0660A P:14.10W PF:0.9170 Lamp Flux:1603.52x1 lm		
NAME: 136-305_15W_4000K	TYPE:15W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0708	PROTECTION ANGLE:

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						Coefficients of Utilization(CU)									
0.0	1.17	1.17	1.17	1.14	1.14	1.14	1.07	1.07	1.07	1.01	1.01	1.01	.95	.95	.95	.93
1.0	1.01	.97	.92	.98	.94	.90	.93	.89	.86	.87	.85	.82	.83	.81	.79	.76
2.0	.88	.81	.75	.85	.79	.73	.80	.75	.70	.76	.72	.68	.72	.68	.65	.63
3.0	.77	.68	.62	.75	.67	.61	.71	.64	.59	.67	.61	.57	.63	.59	.55	.52
4.0	.68	.59	.52	.66	.58	.51	.63	.55	.50	.59	.53	.48	.56	.51	.47	.44
5.0	.60	.51	.45	.59	.50	.44	.56	.49	.43	.53	.47	.42	.51	.45	.41	.38
6.0	.54	.45	.39	.53	.44	.38	.50	.43	.37	.48	.42	.37	.46	.40	.36	.33
7.0	.49	.40	.34	.48	.40	.34	.46	.38	.33	.44	.37	.32	.42	.36	.32	.29
8.0	.45	.36	.30	.44	.36	.30	.42	.35	.29	.40	.34	.29	.38	.33	.28	.26
9.0	.41	.33	.27	.40	.32	.27	.38	.31	.26	.37	.31	.26	.35	.30	.25	.24
10.0	.38	.30	.25	.37	.29	.24	.36	.29	.24	.34	.28	.24	.33	.27	.23	.21



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.600m [K=1.0000]
 Remarks:

WEC AND CCEC

Test:U:230.4V I:0.0660A P:14.10W PF:0.9170 Lamp Flux:1603.52x1 lm		
NAME: 136-305_15W_4000K	TYPE:15W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0708	PROTECTION ANGLE:

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						Wall Exitance Coefficients(WEC)									
0.0																
1.0	.329	.187	.059	.320	.182	.058	.302	.173	.055	.286	.165	.053	.272	.157	.051	
2.0	.302	.165	.051	.293	.162	.050	.278	.154	.048	.263	.148	.046	.250	.141	.045	
3.0	.276	.147	.044	.268	.144	.043	.254	.138	.042	.242	.132	.041	.230	.127	.039	
4.0	.253	.131	.039	.246	.129	.038	.234	.124	.037	.222	.119	.036	.211	.115	.035	
5.0	.232	.118	.034	.227	.116	.034	.215	.112	.033	.205	.108	.032	.195	.104	.031	
6.0	.215	.108	.031	.210	.106	.030	.199	.102	.030	.190	.099	.029	.181	.095	.028	
7.0	.200	.099	.028	.195	.097	.028	.186	.094	.027	.177	.091	.026	.169	.088	.026	
8.0	.186	.091	.026	.182	.089	.025	.173	.087	.025	.165	.084	.024	.158	.081	.024	
9.0	.174	.084	.024	.170	.083	.023	.162	.080	.023	.155	.078	.022	.149	.075	.022	
10.0	.163	.078	.022	.160	.077	.022	.153	.075	.021	.146	.073	.021	.140	.070	.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	.245	.245	.245	.209	.209	.209	.143	.143	.143	.082	.082	.082	.026	.026	.026	
1.0	.236	.211	.188	.202	.181	.162	.138	.124	.112	.080	.072	.065	.026	.023	.021	
2.0	.229	.187	.152	.196	.161	.131	.134	.111	.092	.077	.065	.054	.025	.021	.018	
3.0	.221	.170	.129	.190	.147	.112	.130	.102	.078	.075	.059	.046	.024	.019	.015	
4.0	.213	.157	.114	.183	.136	.099	.126	.094	.069	.073	.055	.041	.023	.018	.014	
5.0	.206	.147	.103	.177	.127	.089	.122	.089	.063	.071	.052	.037	.023	.017	.012	
6.0	.199	.138	.095	.171	.120	.083	.118	.084	.059	.068	.049	.035	.022	.016	.011	
7.0	.192	.132	.089	.165	.114	.078	.114	.080	.055	.066	.047	.033	.021	.015	.011	
8.0	.185	.126	.085	.160	.109	.074	.110	.077	.053	.064	.045	.031	.021	.015	.010	
9.0	.179	.121	.082	.155	.105	.071	.107	.074	.051	.062	.044	.030	.020	.014	.010	
10.0	.174	.117	.079	.150	.101	.069	.104	.071	.049	.061	.042	.029	.020	.014	.010	

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.600m [K=1.0000]
 Remarks:

Uncorrected UGR Table

Test:U:230.4V I:0.0660A P:14.10W PF:0.9170 Lamp Flux:1603.52x1 lm										
NAME: 136-305_15W_4000K					TYPE:15W			WEIGHT:		
DIM.:					SPEC.:4000K			SERIAL No.:1		
MFR.: Tronix Lighting					SUR.:0.0708			PROTECTION ANGLE:		
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	20.1	21.6	20.5	21.9	22.2	19.0	20.4	19.3	20.7	21.1
3H	22.2	23.5	22.6	23.9	24.2	20.4	21.7	20.8	22.1	22.5
4H	23.1	24.4	23.6	24.8	25.2	21.0	22.2	21.4	22.6	23.0
6H	24.1	25.3	24.5	25.7	26.1	21.3	22.5	21.7	22.9	23.3
8H	24.6	25.7	25.0	26.1	26.6	21.4	22.5	21.8	22.9	23.4
12H	25.1	26.2	25.5	26.6	27.0	21.4	22.5	21.8	22.9	23.4
4H 2H	20.7	22.0	21.1	22.3	22.8	19.8	21.1	20.2	21.5	21.9
3H	23.0	24.1	23.4	24.5	24.9	21.5	22.6	22.0	23.0	23.5
4H	24.1	25.1	24.6	25.6	26.0	22.2	23.2	22.7	23.7	24.2
6H	25.2	26.1	25.7	26.6	27.1	22.7	23.6	23.2	24.1	24.6
8H	25.8	26.6	26.3	27.1	27.7	22.9	23.7	23.4	24.2	24.7
12H	26.4	27.2	26.9	27.7	28.2	22.9	23.7	23.4	24.2	24.8
8H 4H	24.4	25.2	24.9	25.7	26.3	22.8	23.6	23.3	24.1	24.7
6H	25.8	26.5	26.3	27.0	27.6	23.5	24.2	24.1	24.8	25.4
8H	26.5	27.1	27.1	27.7	28.3	23.8	24.4	24.4	25.0	25.6
12H	27.3	27.8	27.9	28.4	29.0	24.0	24.5	24.6	25.1	25.7
12H 4H	24.4	25.2	24.9	25.7	26.2	22.9	23.7	23.5	24.2	24.8
6H	25.8	26.5	26.4	27.0	27.6	23.8	24.4	24.4	25.0	25.6
8H	26.7	27.2	27.2	27.8	28.4	24.2	24.7	24.7	25.3	25.9
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.1					+ 0.1 / - 0.2				
1.5H	+ 0.2 / - 0.3					+ 0.2 / - 0.4				
2.0H	+ 0.2 / - 0.3					+ 0.2 / - 0.5				

CIE Pub.117 Corrected 1604 lm Total Lamp Luminous Flux.(8log(F/F0) = 1.6)

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.600m [K=1.0000]
 Remarks:

UTILIZATION FACTORS TABLE

Test:U:230.4V I:0.0660A P:14.10W PF:0.9170 Lamp Flux:1603.52x1 lm		
NAME: 136-305_15W_4000K	TYPE:15W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0708	PROTECTION ANGLE:

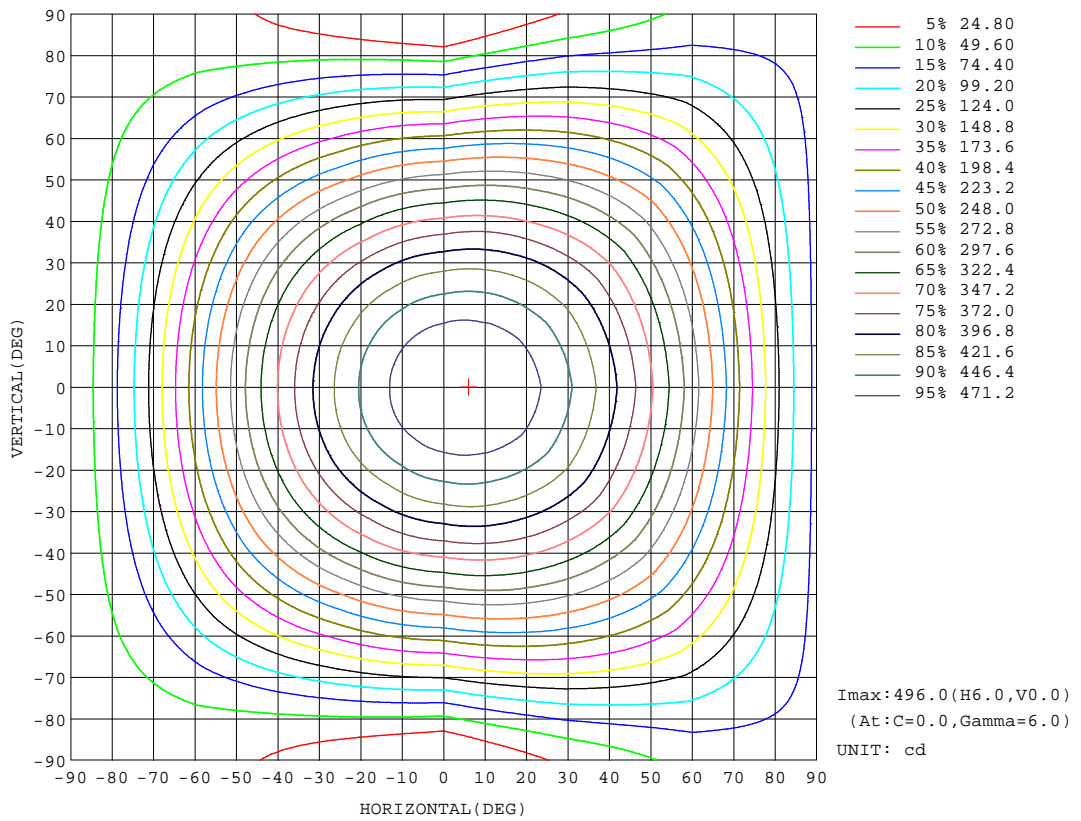
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) k(RI) x RCR = 5									
k = 0.60	54	42	35	53	42	35	52	41	35	28
0.80	64	52	44	63	51	44	61	50	44	36
1.00	72	61	53	71	60	53	68	61	52	44
1.25	79	68	61	77	67	60	74	65	59	51
1.50	84	74	66	82	73	66	78	70	64	55
2.00	91	82	75	89	80	74	85	77	72	63
2.50	95	87	80	93	85	79	88	82	76	66
3.00	99	91	85	96	89	84	91	85	81	70
4.00	103	97	91	100	94	90	95	90	86	75
5.00	106	100	96	103	98	94	97	93	90	78
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.600m [K=1.0000]
 Remarks:

ISOCANDELA DIAGRAM

Test:U:230.4V I:0.0660A P:14.10W PF:0.9170 Lamp Flux:1603.52x1 lm		
NAME: 136-305_15W_4000K	TYPE:15W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0708	PROTECTION ANGLE:



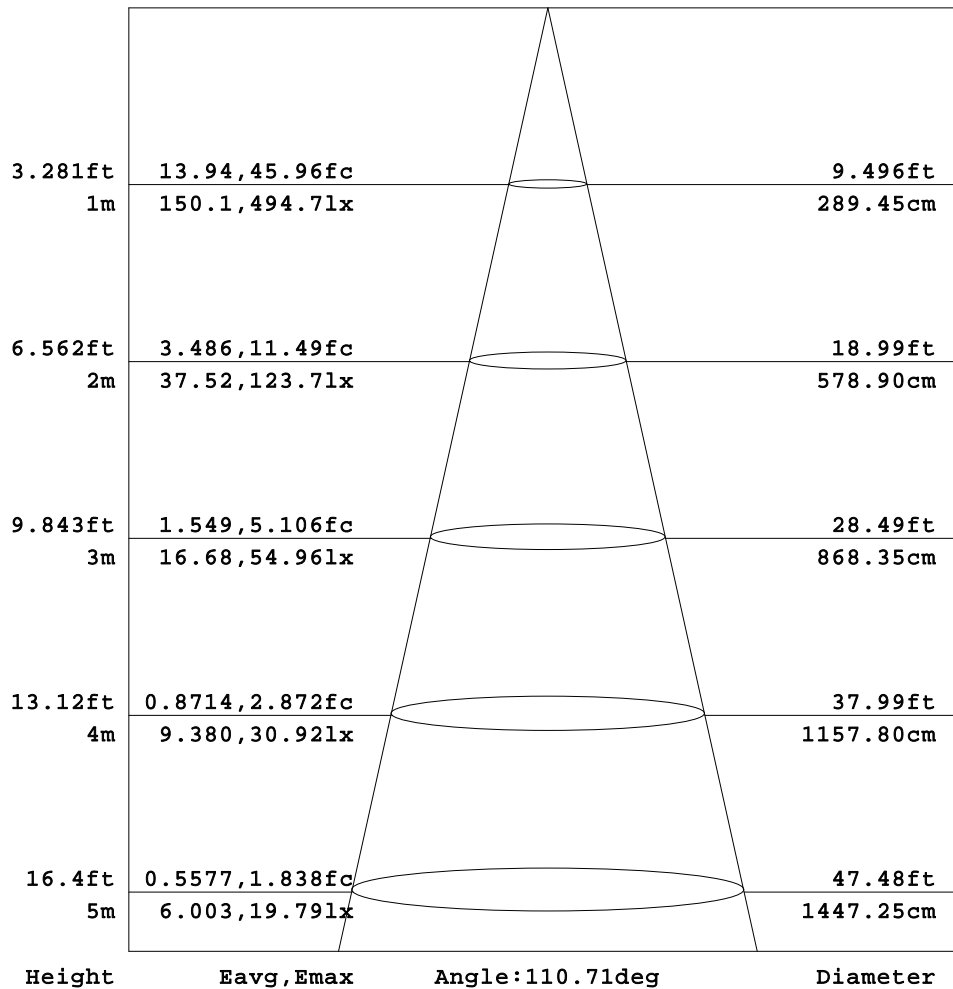
C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.600m [K=1.0000]
 Remarks:

AAI Figure

Test:U:230.4V I:0.0660A P:14.10W PF:0.9170 Lamp Flux:1603.52x1 lm		
NAME: 136-305_15W_4000K	TYPE:15W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0708	PROTECTION ANGLE:

Flux out:1036 lm



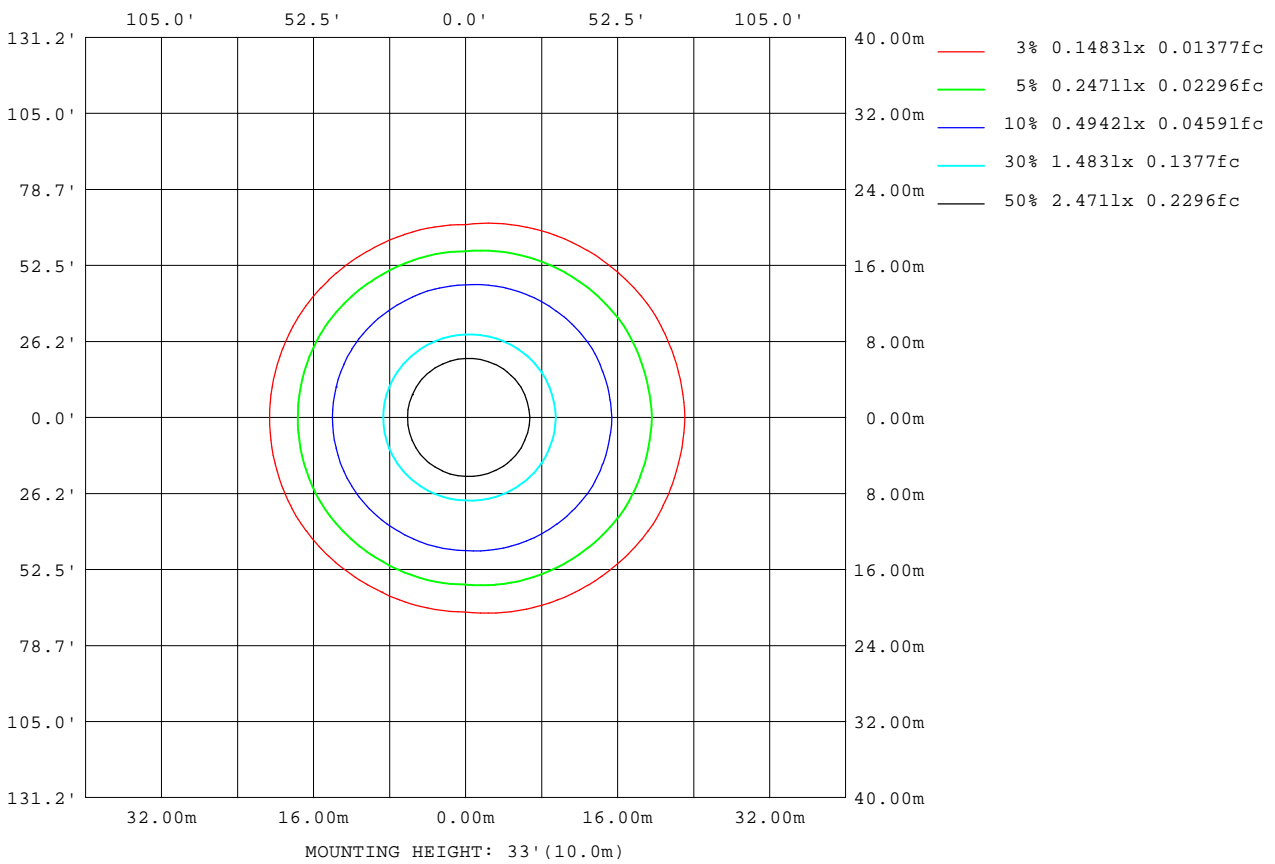
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity: 65.0%
 Test Distance: 9.600m [K=1.0000]
 Remarks:

ISOLUX DIAGRAM

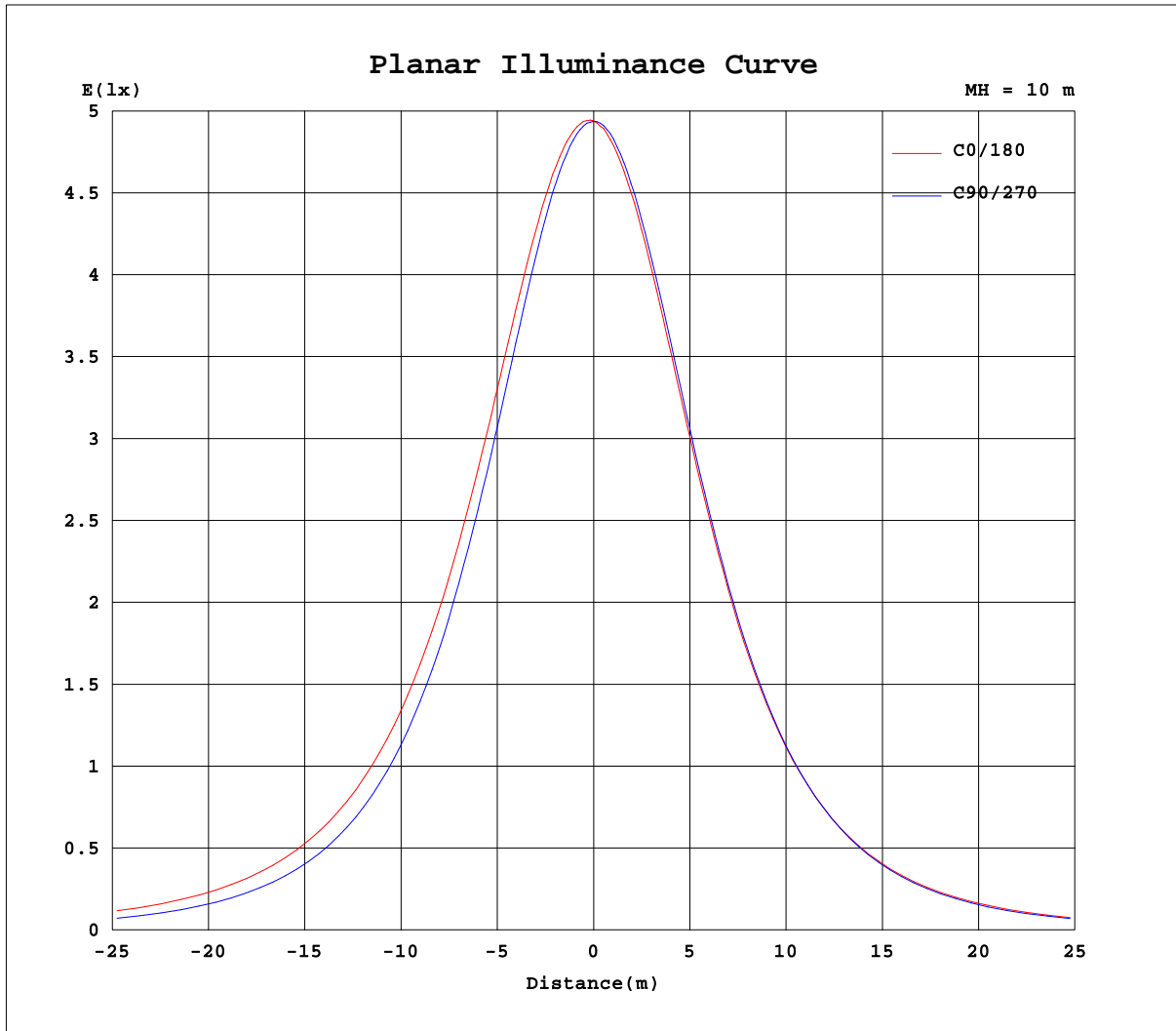
Test:U:230.4V I:0.0660A P:14.10W PF:0.9170 Lamp Flux:1603.52x1 lm		
NAME: 136-305_15W_4000K	TYPE:15W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0708	PROTECTION ANGLE:



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.600m [K=1.0000]
 Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity: 65.0%
 Test Distance: 9.600m [K=1.0000]
 Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:230.4V I:0.0660A P:14.10W PF:0.9170 Lamp Flux:1603.52x1 lm		
NAME: 136-305_15W_4000K	TYPE:15W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0708	PROTECTION ANGLE:

Table--1

UNIT: cd

C(DEG) γ (DEG)	0	30	60	90	120	150	180	210	240	270	300	330						
0	494	494	494	494	494	494	494	494	494	494	494	494						
5	496	496	494	492	490	489	488	489	490	492	494	495						
10	494	493	489	485	481	480	478	479	482	485	489	493						
15	489	487	480	473	469	467	465	466	469	472	479	486						
20	480	477	466	457	452	450	448	449	451	456	465	475						
25	467	462	449	437	431	429	428	428	430	435	448	460						
30	450	444	428	413	406	406	404	404	405	411	426	442						
35	429	423	403	385	378	379	378	377	377	383	401	420						
40	406	398	375	354	348	348	348	347	345	352	372	395						
45	379	370	344	320	314	317	316	315	311	318	341	367						
50	350	339	311	285	279	283	283	281	276	282	308	337						
55	318	307	276	247	242	247	247	245	238	244	273	305						
60	284	272	240	208	204	210	210	208	201	204	236	270						
65	247	235	202	166	165	172	171	169	162	161	199	234						
70	210	197	163	125	126	133	133	130	123	118	160	195						
75	170	158	124	83.4	88.3	96.2	97.2	93.4	85.7	76.7	121	155						
80	131	119	86.1	44.8	54.1	64.9	68.0	62.6	51.9	38.5	82.8	116						
85	95.9	84.3	52.4	14.2	28.7	43.5	48.3	42.1	27.5	10.2	49.2	81.6						
90	68.7	57.7	29.1	1.14	17.4	32.8	38.1	32.1	16.9	0.48	26.6	55.8						
95	51.5	42.1	19.8	0.51	15.0	29.3	34.5	29.1	14.8	0.55	18.3	40.9						
100	43.0	35.7	18.0	1.07	14.0	27.9	33.0	27.7	13.9	1.18	14.6	35.0						
105	40.0	33.7	17.2	1.79	13.2	26.6	31.6	26.5	13.2	1.86	15.5	33.1						
110	38.2	32.3	16.3	2.59	12.5	25.3	30.0	25.2	12.7	2.66	15.6	31.7						
115	36.5	30.8	15.6	3.27	12.0	23.9	28.4	23.9	12.3	3.43	15.3	30.3						
120	34.5	29.2	14.6	3.85	11.4	22.4	26.7	22.5	11.8	4.01	14.8	28.8						
125	32.4	27.5	13.3	4.37	11.1	20.9	24.9	21.1	11.4	4.53	13.7	26.4						
130	30.2	25.9	12.2	4.85	10.7	19.5	23.0	19.6	11.0	5.03	12.7	22.1						
135	28.1	23.7	11.4	5.30	10.4	18.0	21.1	18.1	10.6	5.49	11.8	22.6						
140	25.9	20.6	10.6	5.70	10.0	16.5	19.2	16.6	10.1	5.89	11.0	20.5						
145	23.7	17.7	9.95	6.05	9.64	15.0	17.3	15.2	9.58	6.27	10.4	17.8						
150	21.5	15.1	9.33	6.34	9.22	13.6	15.5	13.6	9.11	6.56	9.70	15.5						
155	19.3	13.0	8.77	6.63	9.04	12.1	13.5	12.1	8.88	6.81	9.09	13.6						
160	17.1	11.3	8.27	7.29	8.92	10.6	11.7	10.7	8.81	7.37	8.57	12.0						
165	15.0	9.82	8.20	7.90	8.99	9.59	10.0	9.61	8.81	8.00	8.35	10.3						
170	12.9	8.57	8.52	8.48	8.82	8.96	8.83	8.81	8.81	8.59	8.66	8.93						
175	10.7	7.63	8.86	8.98	8.82	8.41	7.41	8.18	8.96	9.05	8.94	8.02						
180	8.10	7.69	9.19	9.32	9.08	8.22	8.08	7.70	9.19	9.31	9.08	8.19						

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-06-25

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.600m [K=1.0000]
 Remarks: