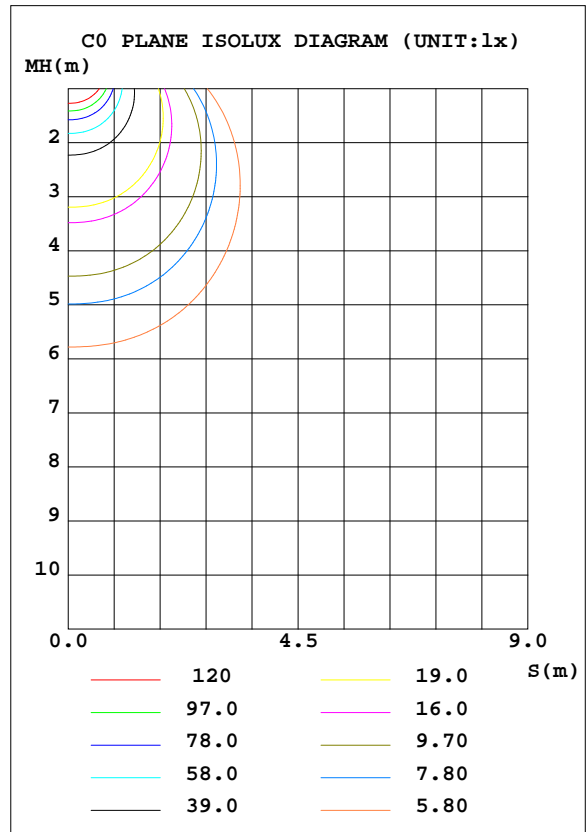
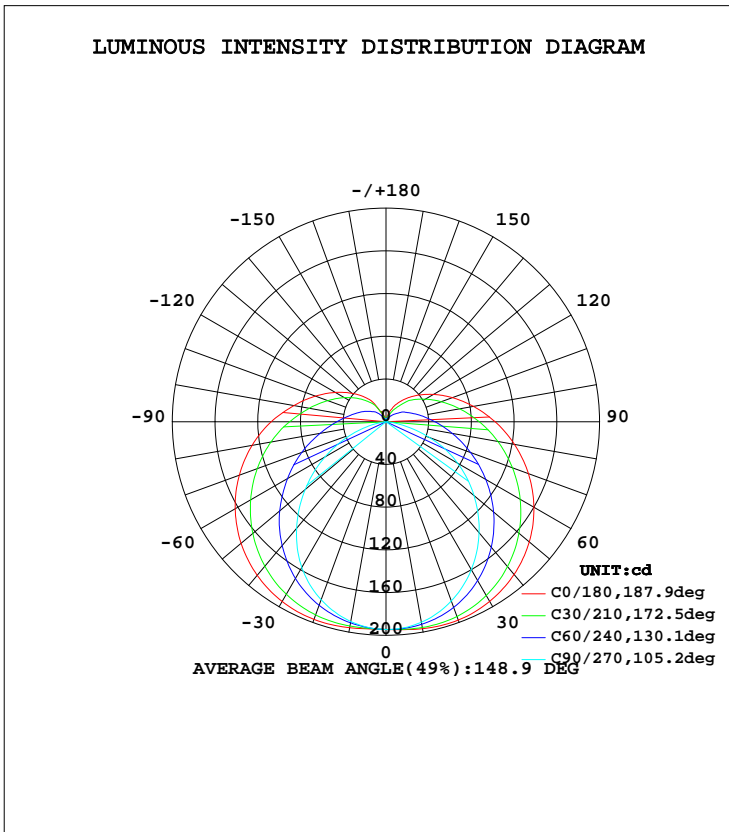


LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:230.2V I:0.0380A P:8.610W PF:0.9660 Lamp Flux:974.517x1 lm		
NAME: 177-061_4000K	TYPE:8W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0086	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 113.18 lm/W			
MODEL	177-061_4000K	I _{max} (cd)	197.8	S/MH(C0/180)	1.50
NOMINAL POWER(W)	9	LOR(%)	100.0	S/MH(C90/270)	1.23
RATED VOLTAGE(V)	230	TOTAL FLUX(lm)	974.52	η UP, DN(C0-180)	9.8, 40.5
NOMINAL FLUX(lm)	974.517	CIE CLASS	SEMI-D.	η UP, DN(C180-360)	9.7, 40.0
LAMPS INSIDE	1	η up(%)	19.5	CIBSE SHR NOM	1.50
TEST VOLTAGE(V)	230.2	η down(%)	80.5	CIBSE SHR MAX	1.55



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.443m [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	196.8	194.1	190.6	193.1	195.8	192.7	189.9	193.5	0- 10	18.51	18.51	1.9,1.9
20	197.6	189.5	178.7	188.4	196.9	187.7	177.4	188.4	10- 20	54.12	72.63	7.45,7.45
30	194.2	179.7	159.9	178.8	194.4	178.1	157.6	178.0	20- 30	84.80	157.4	16.2,16.2
40	186.6	165.2	135.6	164.8	187.7	163.9	130.3	163.3	30- 40	107.1	264.5	27.1,27.1
50	175.1	146.9	107.6	147.0	177.1	146.3	98.88	144.8	40- 50	118.8	383.3	39.3,39.3
60	159.9	126.4	77.39	127.0	163.1	126.3	66.08	124.3	50- 60	119.6	503.0	51.6,51.6
70	141.9	105.1	43.31	106.1	146.1	106.0	33.89	103.2	60- 70	110.8	613.7	63,63
80	122.1	84.65	10.95	86.05	127.2	85.96	6.945	82.91	70- 80	94.52	708.2	72.7,72.7
90	102.2	66.58	0.6814	68.56	107.5	68.11	0.7117	65.12	80- 90	76.37	784.6	80.5,80.5
100	83.22	51.77	0.8894	54.00	87.57	53.66	0.7888	50.52	90-100	60.68	845.3	86.7,86.7
110	66.18	39.74	0.9741	42.14	70.35	42.09	1.046	37.63	100-110	46.19	891.5	91.5,91.5
120	51.36	30.43	1.351	32.14	55.08	32.50	1.368	26.82	110-120	33.80	925.3	94.9,94.9
130	38.70	21.86	1.662	23.99	41.52	24.32	1.691	19.63	120-130	22.98	948.3	97.3,97.3
140	27.88	13.54	1.973	16.42	29.60	16.69	2.008	12.91	130-140	14.35	962.6	98.8,98.8
150	18.72	8.259	2.283	8.917	13.08	7.883	2.313	7.797	140-150	7.558	970.2	99.6,99.6
160	10.30	4.504	2.522	4.366	9.113	4.217	2.576	4.535	150-160	3.011	973.2	99.9,99.9
170	2.991	2.770	2.749	2.858	2.921	2.820	2.791	3.009	160-170	1.057	974.2	100,100
180	2.835	2.833	2.833	2.907	2.835	2.857	2.851	2.907	170-180	0.2716	974.5	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

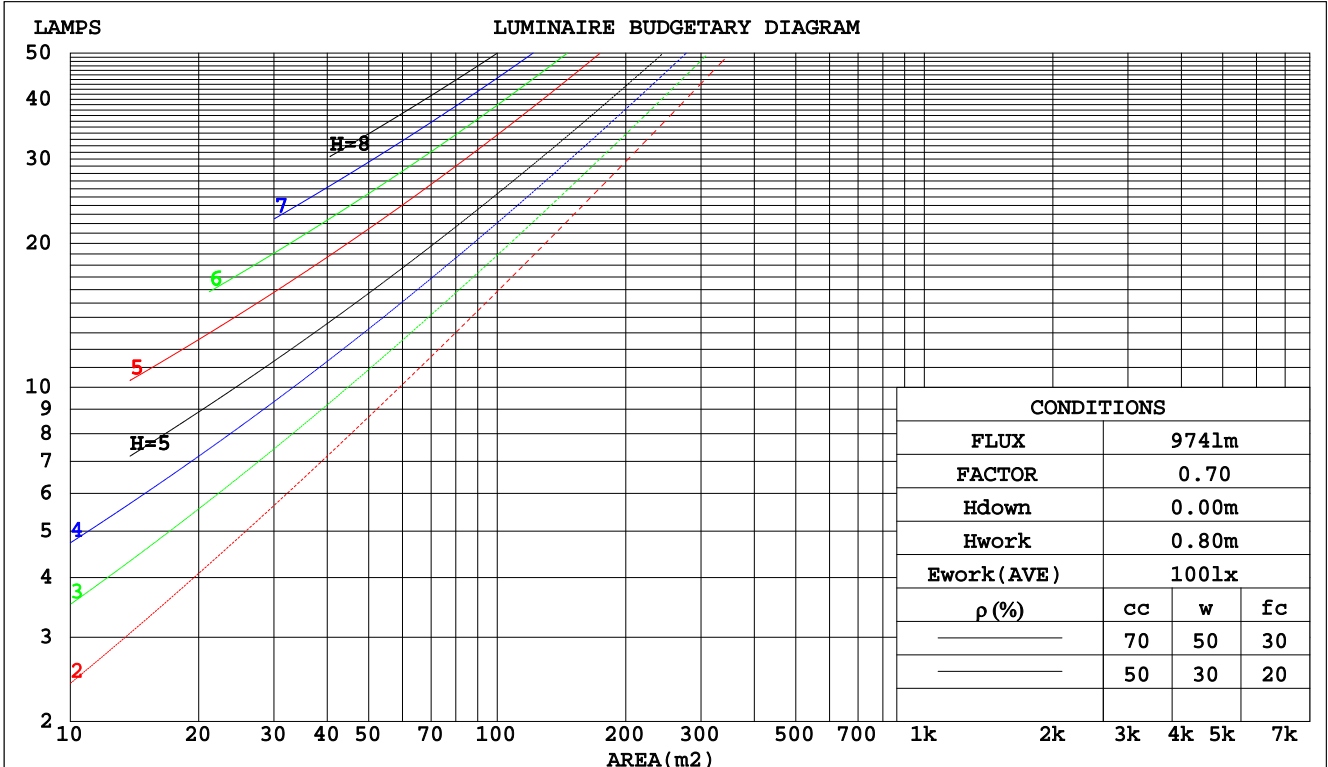
C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.443m [K=1.0000]
 Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:230.2V I:0.0380A P:8.610W PF:0.9660 Lamp Flux:974.517x1 lm		
NAME: 177-061_4000K	TYPE:8W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0086	PROTECTION ANGLE:

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	1.14	1.14	1.14	1.09	1.09	1.09	1.00	1.00	1.00	.92	.92	.92	.84	.84	.84	.81
1.0	.95	.90	.85	.91	.86	.81	.83	.79	.75	.76	.72	.69	.69	.66	.64	.60
2.0	.81	.73	.66	.77	.70	.64	.71	.65	.60	.64	.60	.55	.59	.55	.51	.48
3.0	.70	.61	.54	.67	.59	.52	.61	.54	.49	.56	.50	.45	.51	.46	.42	.39
4.0	.62	.52	.45	.59	.50	.43	.54	.46	.41	.49	.43	.38	.45	.40	.35	.32
5.0	.55	.45	.38	.52	.43	.37	.48	.40	.35	.44	.37	.32	.40	.35	.30	.28
6.0	.49	.39	.33	.47	.38	.32	.43	.35	.30	.39	.33	.28	.36	.31	.26	.24
7.0	.44	.35	.28	.42	.34	.28	.39	.32	.26	.36	.29	.25	.33	.27	.23	.21
8.0	.40	.31	.25	.38	.30	.24	.35	.28	.23	.33	.26	.22	.30	.25	.21	.18
9.0	.36	.28	.22	.35	.27	.22	.32	.26	.21	.30	.24	.20	.28	.22	.18	.16
10.0	.33	.25	.20	.32	.25	.20	.30	.23	.19	.28	.22	.18	.26	.20	.17	.15



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.443m [K=1.0000]
 Remarks:

WEC AND CCEC

Test:U:230.2V I:0.0380A P:8.610W PF:0.9660 Lamp Flux:974.517x1 lm		
NAME: 177-061_4000K	TYPE:8W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0086	PROTECTION ANGLE:

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	.391	.222	.070	.378	.215	.068	.353	.203	.065	.330	.191	.061	.309	.179	.058	
2.0	.337	.185	.057	.325	.179	.055	.303	.168	.052	.282	.158	.050	.263	.149	.047	
3.0	.299	.159	.048	.288	.154	.046	.268	.145	.044	.249	.136	.042	.231	.128	.040	
4.0	.268	.139	.041	.259	.135	.040	.240	.127	.038	.223	.120	.036	.207	.113	.034	
5.0	.244	.124	.036	.235	.121	.035	.218	.114	.033	.203	.107	.032	.188	.100	.030	
6.0	.223	.112	.032	.215	.109	.031	.200	.102	.030	.185	.096	.028	.172	.091	.027	
7.0	.206	.102	.029	.198	.099	.028	.184	.093	.027	.171	.088	.026	.159	.083	.024	
8.0	.190	.093	.026	.184	.090	.026	.171	.085	.024	.159	.081	.023	.148	.076	.022	
9.0	.177	.086	.024	.171	.083	.023	.159	.079	.022	.148	.074	.021	.138	.070	.020	
10.0	.166	.080	.022	.160	.077	.022	.149	.073	.021	.139	.069	.020	.129	.065	.019	

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	.339	.339	.339	.290	.290	.290	.198	.198	.198	.114	.114	.114	.036	.036	.036	
1.0	.336	.305	.278	.287	.262	.239	.196	.180	.165	.113	.104	.096	.036	.034	.031	
2.0	.329	.282	.243	.282	.243	.210	.193	.168	.147	.111	.098	.086	.036	.032	.028	
3.0	.321	.266	.222	.276	.229	.192	.189	.159	.135	.109	.093	.079	.035	.030	.026	
4.0	.314	.254	.208	.269	.219	.180	.185	.153	.127	.107	.089	.075	.034	.029	.025	
5.0	.306	.244	.198	.263	.211	.172	.181	.147	.122	.105	.087	.072	.034	.028	.024	
6.0	.299	.236	.191	.257	.204	.166	.177	.143	.118	.103	.084	.070	.033	.028	.023	
7.0	.291	.229	.186	.251	.199	.162	.173	.139	.115	.101	.082	.068	.033	.027	.023	
8.0	.285	.224	.182	.245	.194	.159	.170	.136	.113	.099	.080	.067	.032	.026	.022	
9.0	.278	.219	.179	.240	.190	.156	.166	.134	.111	.097	.079	.066	.031	.026	.022	
10.0	.273	.215	.176	.235	.187	.154	.163	.131	.109	.095	.078	.065	.031	.026	.022	

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.443m [K=1.0000]
 Remarks:

Uncorrected UGR Table

Test:U:230.2V I:0.0380A P:8.610W PF:0.9660 Lamp Flux:974.517x1 lm										
NAME: 177-061_4000K					TYPE:8W			WEIGHT:		
DIM.:					SPEC.:4000K			SERIAL No.:1		
MFR.: Tronix Lighting					SUR.:0.0086			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	24.4	25.8	25.0	26.3	26.9	21.7	23.1	22.2	23.6	24.2
3H	27.2	28.4	27.7	29.0	29.6	23.2	24.4	23.7	25.0	25.6
4H	28.7	29.9	29.3	30.5	31.1	23.7	24.9	24.2	25.4	26.1
6H	30.4	31.5	31.0	32.1	32.8	23.9	25.1	24.5	25.7	26.3
8H	31.3	32.4	31.9	33.0	33.7	24.0	25.1	24.6	25.7	26.4
12H	32.3	33.4	33.0	34.0	34.7	24.0	25.0	24.6	25.6	26.3
4H 2H	25.0	26.2	25.6	26.7	27.4	23.0	24.2	23.6	24.8	25.5
3H	28.0	29.0	28.6	29.7	30.4	24.8	25.9	25.4	26.5	27.2
4H	29.7	30.7	30.3	31.3	32.0	25.6	26.5	26.2	27.2	27.9
6H	31.6	32.4	32.2	33.1	33.9	26.1	27.0	26.8	27.6	28.4
8H	32.6	33.4	33.3	34.1	34.9	26.3	27.1	26.9	27.7	28.5
12H	33.8	34.6	34.5	35.3	36.1	26.3	27.1	27.0	27.8	28.6
8H 4H	30.0	30.8	30.7	31.5	32.3	26.8	27.6	27.5	28.3	29.1
6H	32.2	32.9	32.9	33.6	34.4	27.8	28.5	28.5	29.2	30.1
8H	33.5	34.1	34.2	34.8	35.7	28.3	28.9	29.0	29.6	30.5
12H	35.0	35.5	35.7	36.2	37.1	28.6	29.1	29.3	29.9	30.7
12H 4H	30.0	30.8	30.7	31.5	32.3	27.2	28.0	27.9	28.7	29.5
6H	32.3	33.0	33.1	33.7	34.5	28.5	29.1	29.2	29.9	30.7
8H	33.7	34.3	34.5	35.0	35.9	29.2	29.7	29.9	30.4	31.3
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.1					+ 0.1 / - 0.1				
1.5H	+ 0.2 / - 0.3					+ 0.2 / - 0.3				
2.0H	+ 0.2 / - 0.3					+ 0.3 / - 0.4				

CIE Pub.117 Corrected 974.5 lm Total Lamp Luminous Flux. (8log(F/F0) = -0.1)

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.443m [K=1.0000]
 Remarks:

UTILIZATION FACTORS TABLE

Test:U:230.2V I:0.0380A P:8.610W PF:0.9660 Lamp Flux:974.517x1 lm		
NAME: 177-061_4000K	TYPE:8W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0086	PROTECTION ANGLE:

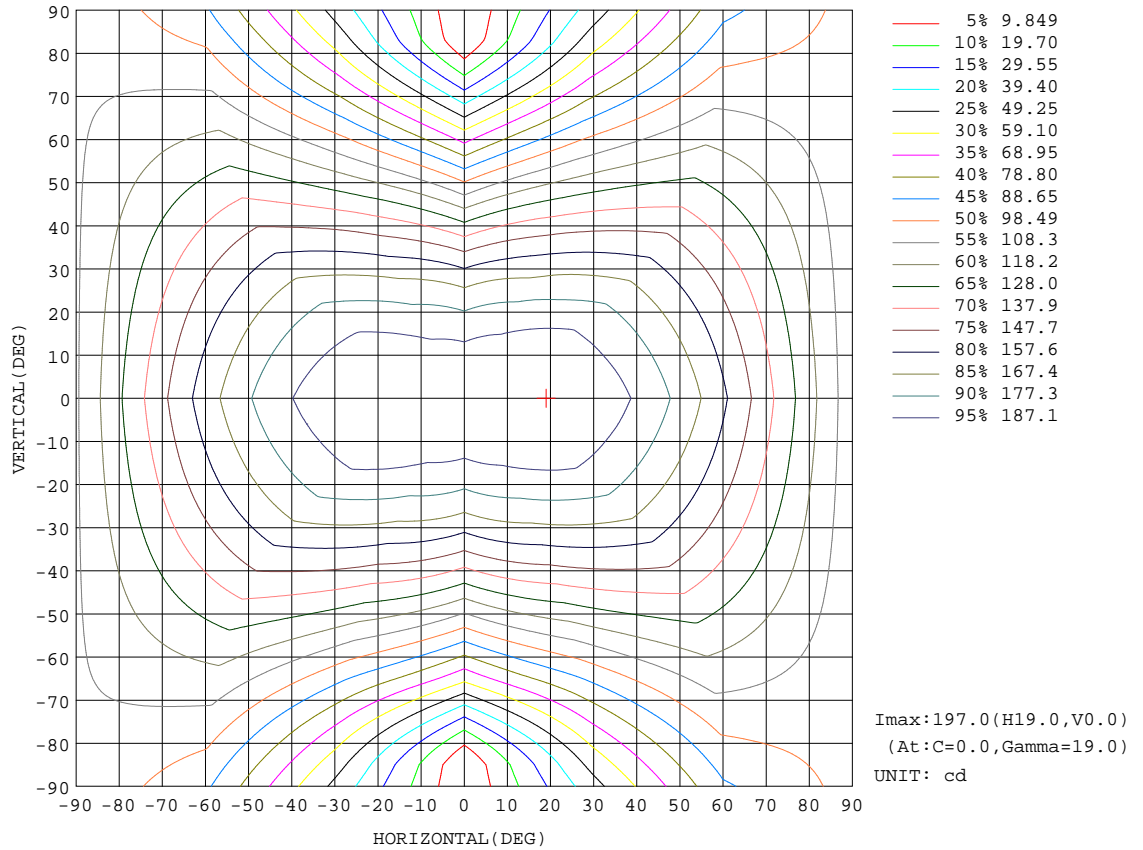
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
k = 0.60	47	34	27	46	34	27	44	33	26	20
0.80	56	43	35	54	42	34	51	41	33	25
1.00	64	50	42	62	49	41	58	50	40	31
1.25	71	58	49	68	56	48	64	54	46	37
1.50	76	63	54	73	62	53	68	58	51	41
2.00	83	72	63	80	70	62	74	65	59	47
2.50	88	77	69	84	75	67	78	70	64	51
3.00	91	82	74	88	79	72	81	74	68	54
4.00	96	88	81	92	85	79	85	79	74	59
5.00	99	92	86	95	89	83	87	82	78	62
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:2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.443m [K=1.0000]
 Remarks:

ISOCANDELA DIAGRAM

Test:U:230.2V I:0.0380A P:8.610W PF:0.9660 Lamp Flux:974.517x1 lm		
NAME: 177-061_4000K	TYPE:8W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0086	PROTECTION ANGLE:

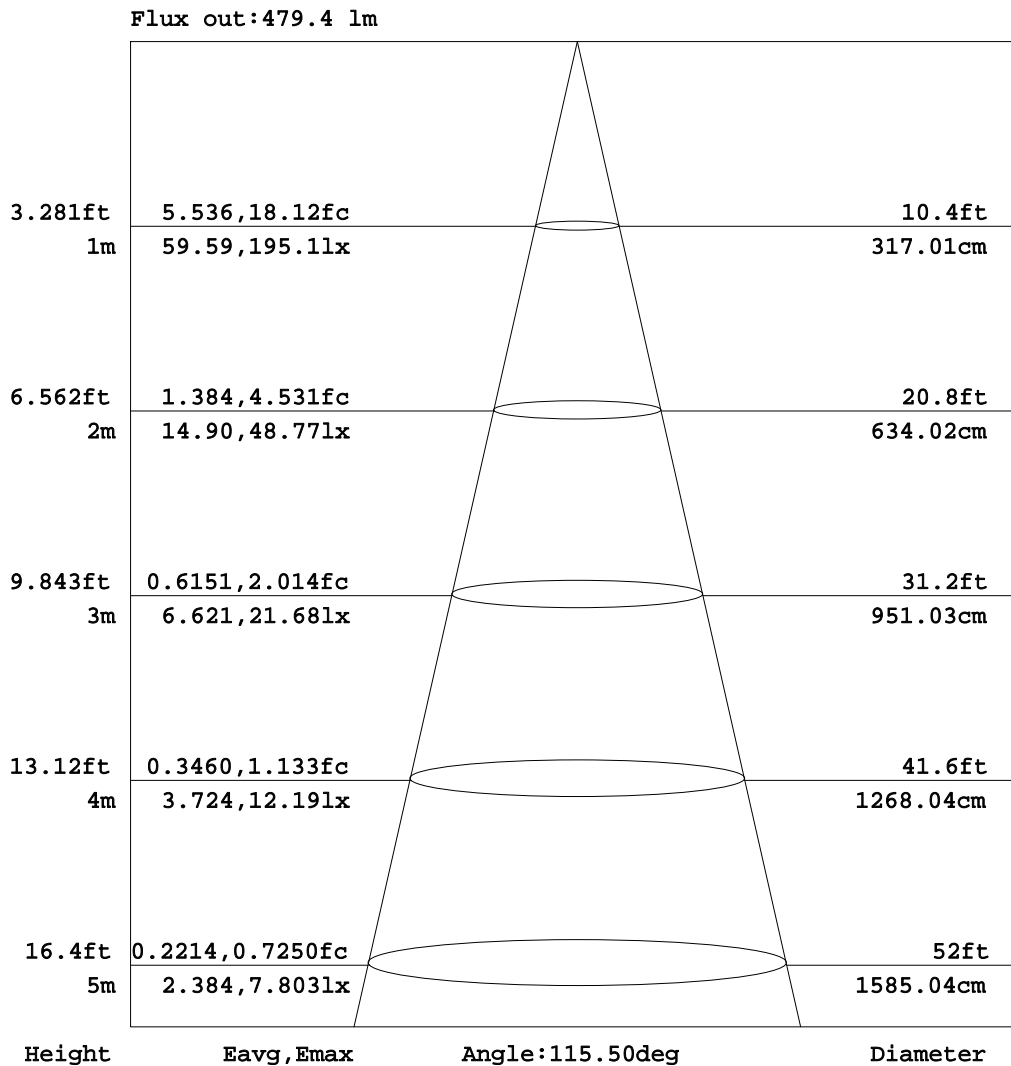


C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.443m [K=1.0000]
 Remarks:

AAI Figure

Test:U:230.2V I:0.0380A P:8.610W PF:0.9660 Lamp Flux:974.517x1 lm		
NAME: 177-061_4000K	TYPE:8W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0086	PROTECTION ANGLE:



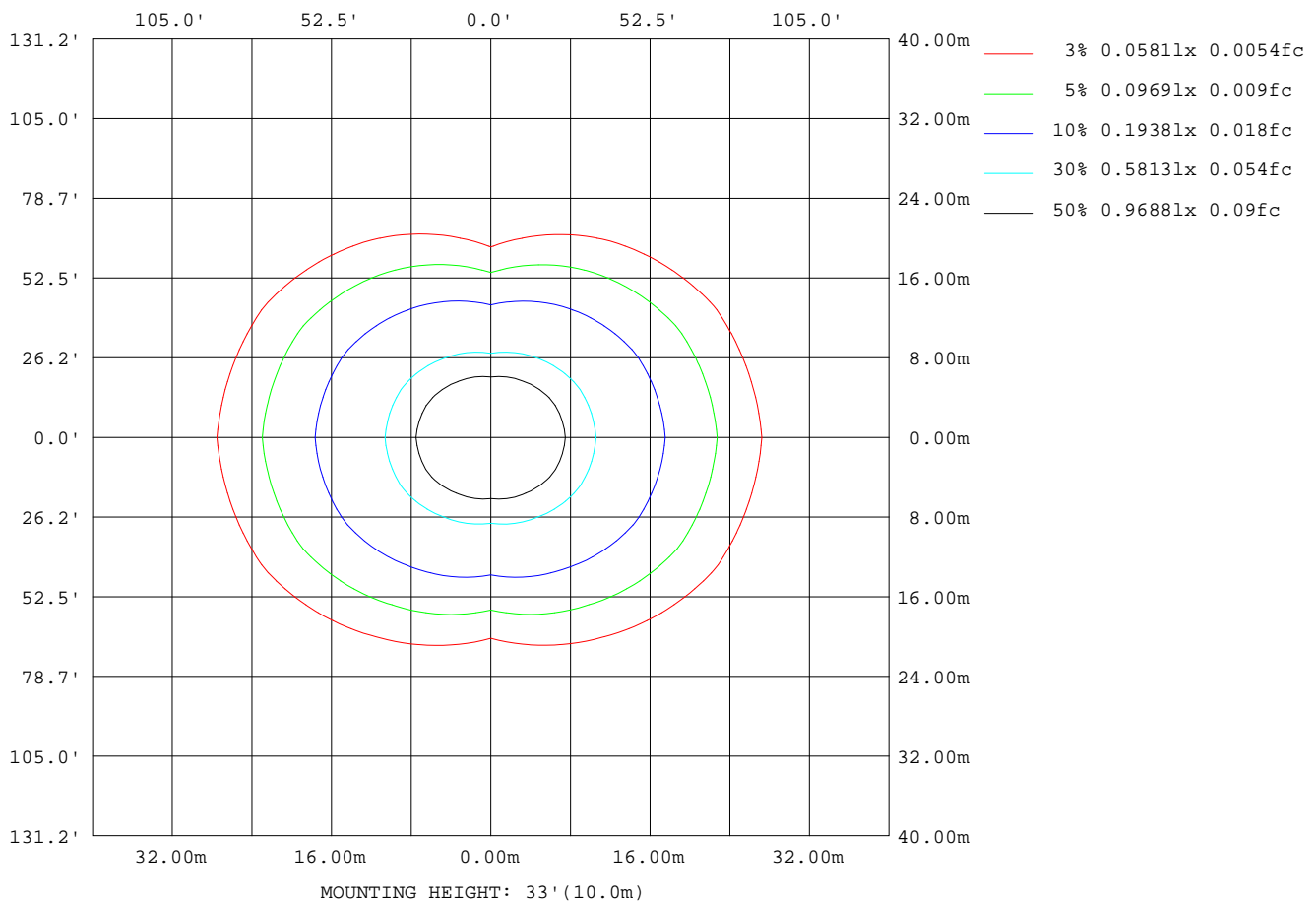
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.443m [K=1.0000]
 Remarks:

ISOLUX DIAGRAM

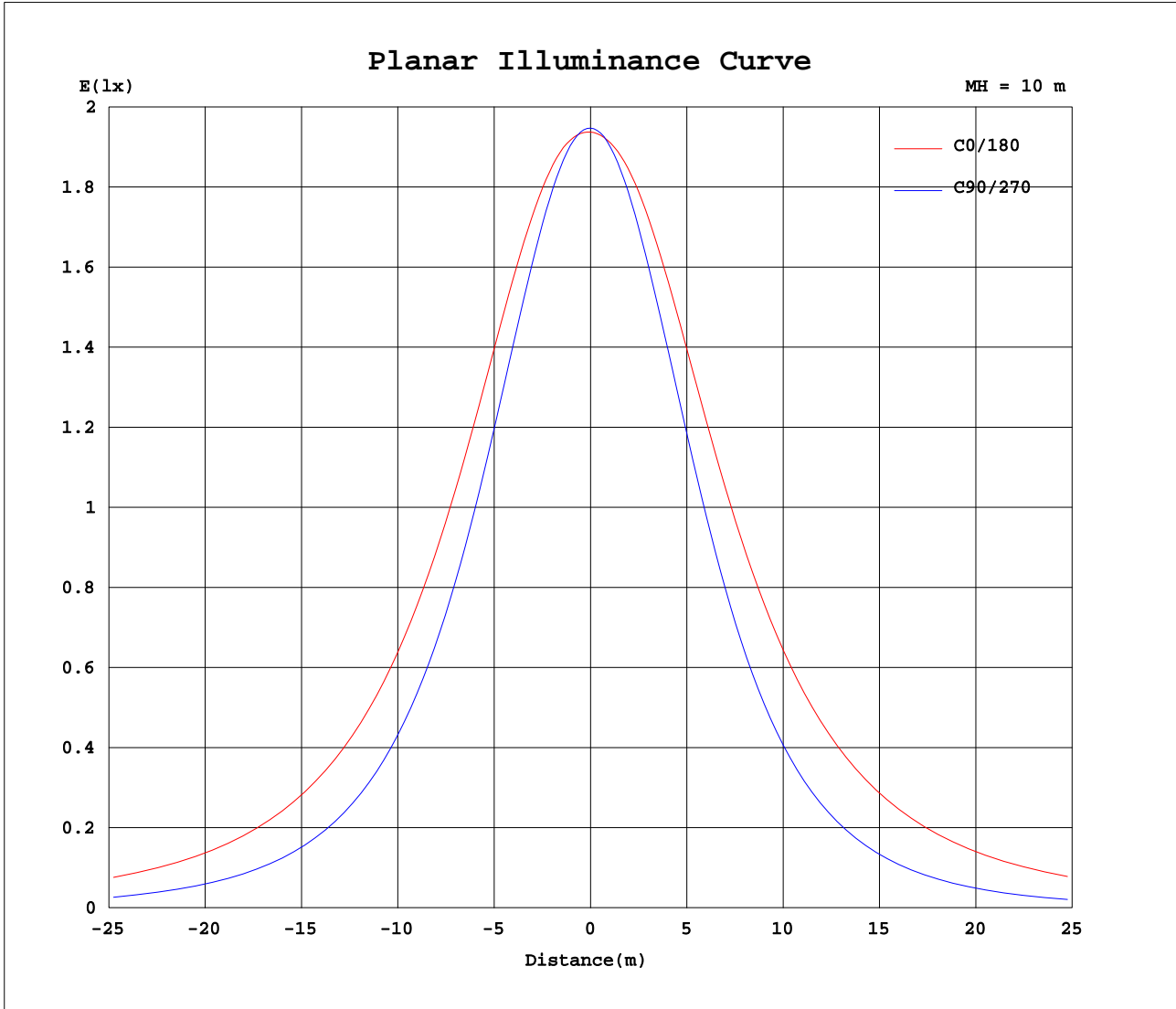
Test:U:230.2V I:0.0380A P:8.610W PF:0.9660 Lamp Flux:974.517x1 lm		
NAME: 177-061_4000K	TYPE:8W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0086	PROTECTION ANGLE:



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.443m [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: 2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity: 65.0%
 Test Distance: 9.443m [K=1.0000]
 Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:230.2V I:0.0380A P:8.610W PF:0.9660 Lamp Flux:974.517x1 lm		
NAME: 177-061_4000K	TYPE:8W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0086	PROTECTION ANGLE:

Table--1

UNIT: cd

C(DEG) γ (DEG)	0	30	60	90	120	150	180	210	240	270	300	330							
0	195	195	195	195	195	195	195	195	195	195	195	195							
5	195	195	194	194	194	194	195	194	193	193	194	195							
10	197	196	193	191	192	195	196	194	191	190	192	195							
15	198	195	190	186	189	194	197	194	188	185	189	195							
20	198	194	185	179	184	193	197	192	183	177	184	193							
25	196	192	179	170	178	191	196	190	177	168	177	190							
30	194	188	172	160	171	187	194	187	170	158	170	186							
35	191	183	163	148	162	183	191	182	161	145	161	181							
40	187	177	153	136	153	177	188	176	151	130	151	175							
45	181	170	143	122	142	170	183	170	141	115	141	168							
50	175	162	131	108	131	163	177	163	130	98.9	129	160							
55	168	154	120	92.8	120	155	170	155	118	82.5	117	152							
60	160	145	108	77.4	108	146	163	146	106	66.1	106	143							
65	151	136	95.9	61.7	96.2	137	155	137	95.2	49.7	94.0	134							
70	142	126	84.2	43.3	84.7	127	146	128	83.9	33.9	82.4	124							
75	132	116	73.2	25.8	73.6	118	137	119	72.9	19.2	71.5	114							
80	122	106	63.0	11.0	63.4	109	127	109	62.6	6.94	61.3	104							
85	112	96.7	53.9	0.97	54.5	99.4	117	99.9	53.7	0.90	52.3	95.0							
90	102	87.4	45.8	0.68	46.8	90.3	107	90.3	46.0	0.71	44.4	85.8							
95	92.5	78.5	39.1	0.82	40.2	81.6	97.2	81.2	39.7	0.69	37.8	77.0							
100	83.2	70.1	33.5	0.89	34.7	73.3	87.6	73.0	34.3	0.79	32.3	68.7							
105	74.5	62.3	28.5	0.93	30.1	65.4	78.8	65.3	29.9	0.92	24.3	61.1							
110	66.2	55.1	24.4	0.97	26.2	58.1	70.3	58.0	26.2	1.05	21.2	54.1							
115	58.5	48.5	21.0	1.16	22.8	51.2	62.5	51.4	22.9	1.19	20.7	46.9							
120	51.4	42.4	18.4	1.35	19.6	44.7	55.1	45.3	19.7	1.37	18.1	35.5							
125	44.8	37.0	14.6	1.51	16.9	38.8	48.0	39.4	16.8	1.52	14.4	32.0							
130	38.7	31.9	11.8	1.66	14.5	33.4	41.5	33.9	14.7	1.69	11.6	27.7							
135	33.1	26.2	9.45	1.82	11.1	28.5	35.4	28.7	12.2	1.86	9.27	23.0							
140	27.9	19.9	7.23	1.97	8.97	23.9	29.6	24.0	9.38	2.01	7.13	18.7							
145	23.1	15.2	5.97	2.13	6.34	19.6	24.1	19.7	6.19	2.17	5.80	14.3							
150	18.7	11.4	5.14	2.28	4.26	13.6	13.1	12.2	3.54	2.31	4.98	10.6							
155	14.2	7.86	4.30	2.41	2.81	7.69	9.65	8.78	2.79	2.44	4.17	7.32							
160	10.3	5.87	3.14	2.52	2.73	6.00	9.11	5.74	2.70	2.58	3.42	5.65							
165	5.00	4.45	2.73	2.64	2.77	3.01	4.04	2.89	2.81	2.73	2.99	4.29							
170	2.99	2.76	2.78	2.75	2.83	2.89	2.92	2.77	2.87	2.79	2.82	3.20							
175	2.80	2.76	2.83	2.80	2.88	2.90	2.85	2.82	2.90	2.82	2.88	2.91							
180	2.84	2.78	2.88	2.83	2.89	2.92	2.84	2.82	2.89	2.85	2.88	2.94							

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2019-12-05

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.276
 Humidity:65.0%
 Test Distance:9.443m [K=1.0000]
 Remarks: