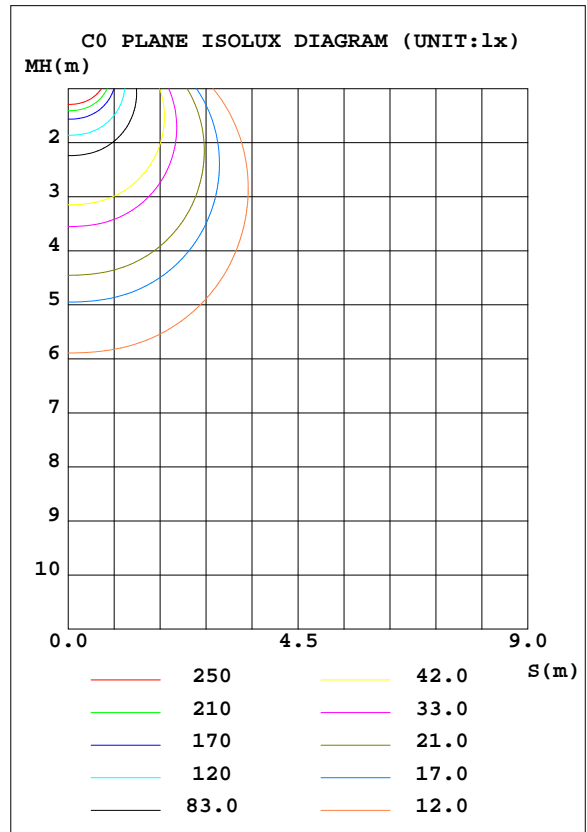
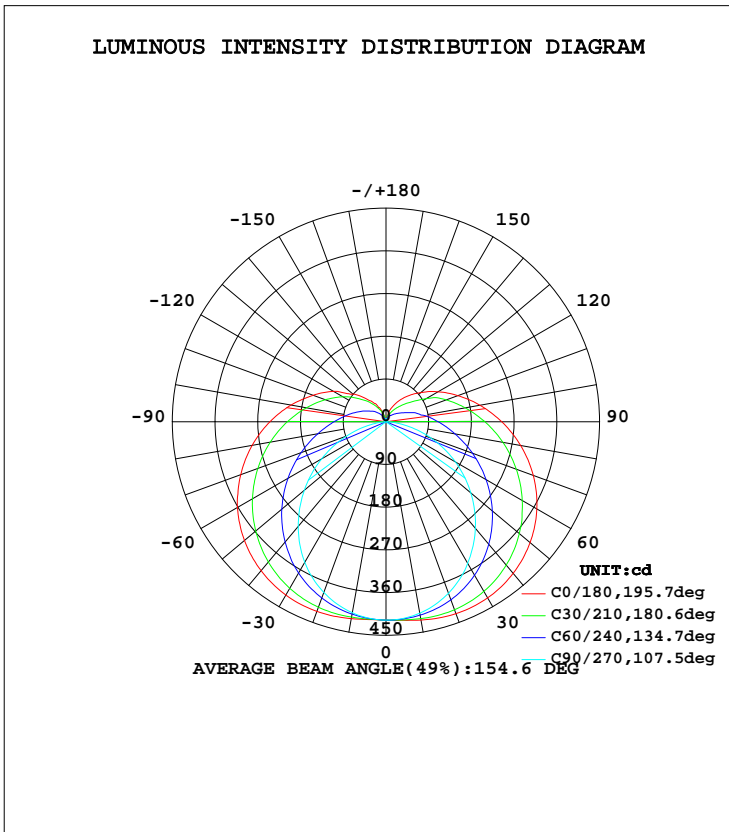


LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:230.2V I:0.0860A P:18.20W PF:0.9120 Lamp Flux:2203.4lx1 lm		
NAME: 177-062_4000K	TYPE:18W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0182	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 121.07 lm/W			
MODEL	177-062_4000K	I _{max} (cd)	430.7	S/MH(C0/180)	1.55
NOMINAL POWER(W)	18	LOR(%)	100.0	S/MH(C90/270)	1.23
RATED VOLTAGE(V)	230	TOTAL FLUX(lm)	2203.4	η UP, DN(C0-180)	10.3, 40.0
NOMINAL FLUX(lm)	2203.41	CIE CLASS	SEMI-D.	η UP, DN(C180-360)	10.1, 39.6
LAMPS INSIDE	1	η up(%)	20.4	CIBSE SHR NOM	1.50
TEST VOLTAGE(V)	230.2	η down(%)	79.6	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	424.2	417.4	409.6	415.1	421.1	414.7	408.5	416.7	0- 10	39.80	39.80	1.81,1.81
20	430.4	410.4	384.6	406.2	425.3	405.6	382.8	408.9	10- 20	116.7	156.5	7.1,7.1
30	428.3	392.9	344.1	387.3	421.7	386.6	342.2	390.5	20- 30	184.1	340.6	15.5,15.5
40	416.8	365.5	292.9	358.9	409.5	358.1	287.7	362.0	30- 40	234.3	574.9	26.1,26.1
50	396.1	329.5	233.4	323.0	389.2	322.4	224.7	325.5	40- 50	262.7	837.5	38,38
60	367.0	287.4	168.6	281.3	361.3	281.6	156.8	283.6	50- 60	267.7	1105	50.2,50.2
70	330.1	242.9	101.6	237.8	325.7	238.7	88.93	239.2	60- 70	251.4	1357	61.6,61.6
80	288.0	198.8	39.15	195.2	286.3	196.6	28.69	195.4	70- 80	218.8	1575	71.5,71.5
90	243.9	159.2	1.559	157.3	244.6	158.7	2.091	156.0	80- 90	178.9	1754	79.6,79.6
100	201.0	124.6	2.205	125.3	203.5	126.5	2.598	119.8	90-100	143.3	1898	86.1,86.1
110	161.4	96.03	2.969	98.80	163.5	98.91	3.249	94.60	100-110	110.4	2008	91.1,91.1
120	126.7	67.59	3.692	75.28	128.5	75.52	3.900	63.19	110-120	79.87	2088	94.8,94.8
130	95.69	44.55	4.415	55.87	91.00	55.41	4.539	43.64	120-130	52.69	2141	97.2,97.2
140	70.79	29.69	5.006	40.06	61.76	38.62	5.184	29.11	130-140	32.64	2173	98.6,98.6
150	48.34	20.35	5.573	25.25	43.66	24.54	5.710	20.18	140-150	18.32	2192	99.5,99.5
160	28.31	11.20	6.003	12.73	20.92	12.32	6.105	11.14	150-160	8.430	2200	99.9,99.9
170	6.523	6.418	6.386	6.553	6.462	6.496	6.373	6.386	160-170	2.669	2203	100,100
180	6.552	6.532	6.505	6.535	6.546	6.532	6.517	6.544	170-180	0.6193	2203	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

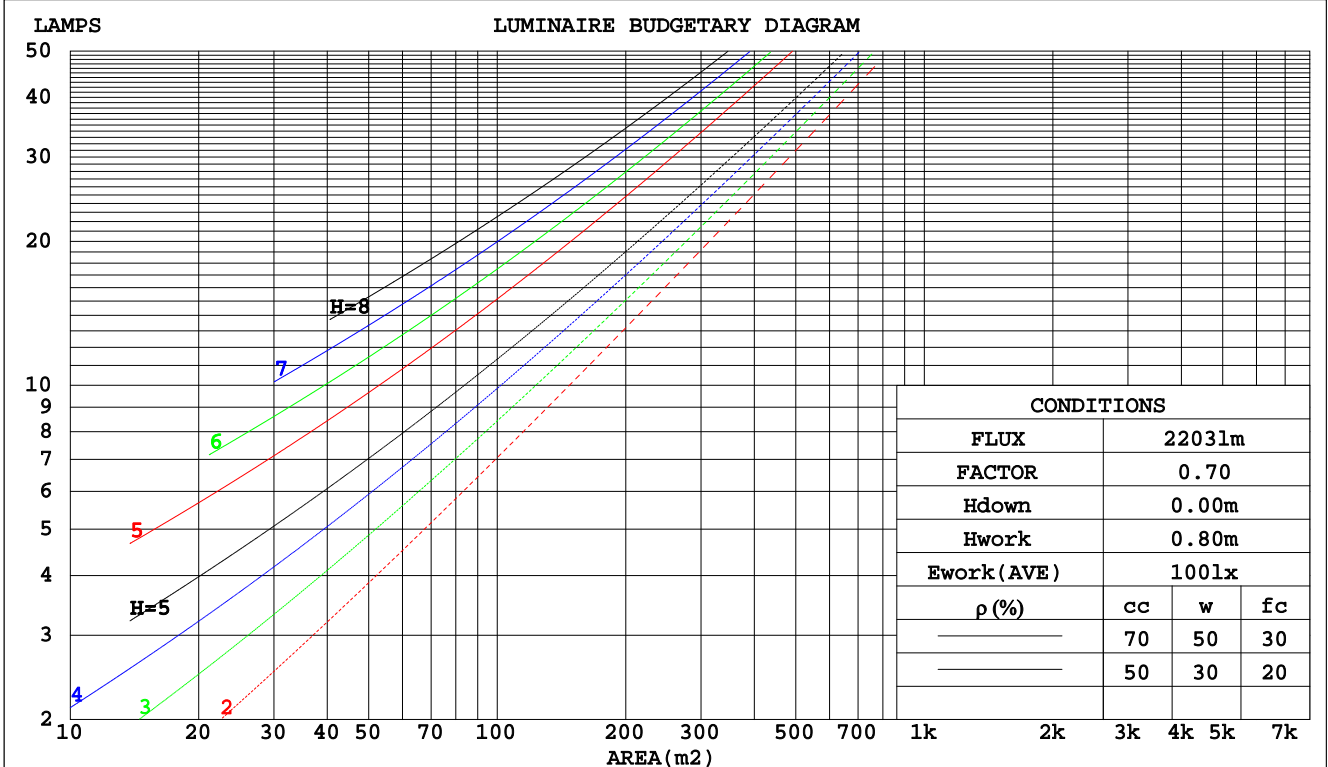
C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2019-12-05

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:0.0860A P:18.20W PF:0.9120 Lamp Flux:2203.4lx1 lm		
NAME: 177-062_4000K	TYPE:18W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0182	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	.00	.00	.00	.91	.91	.91	.83	.83	.83	.80
1.0	.95	.89	.84	.90	.85	.81	.82	.78	.74	.75	.71	.69	.68	.65	.63	.59
2.0	.81	.73	.66	.77	.70	.63	.70	.64	.59	.63	.59	.54	.57	.54	.50	.47
3.0	.70	.60	.53	.66	.58	.51	.60	.54	.48	.55	.49	.44	.50	.45	.41	.38
4.0	.61	.51	.44	.58	.49	.43	.53	.46	.40	.48	.42	.37	.44	.39	.35	.32
5.0	.54	.44	.37	.52	.43	.36	.47	.40	.34	.43	.37	.32	.39	.34	.29	.27
6.0	.48	.39	.32	.46	.37	.31	.42	.35	.29	.39	.32	.27	.35	.30	.26	.23
7.0	.44	.34	.28	.42	.33	.27	.38	.31	.26	.35	.29	.24	.32	.27	.22	.20
8.0	.39	.31	.25	.38	.30	.24	.35	.28	.23	.32	.26	.21	.29	.24	.20	.18
9.0	.36	.28	.22	.35	.27	.21	.32	.25	.20	.29	.23	.19	.27	.22	.18	.16
10.0	.33	.25	.20	.32	.24	.19	.29	.23	.18	.27	.21	.17	.25	.20	.16	.14



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:0.0860A P:18.20W PF:0.9120 Lamp Flux:2203.41x1 lm		
NAME: 177-062_4000K	TYPE:18W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0182	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	.396	.225	.071	.382	.218	.069	.357	.205	.065	.334	.193	.062	.312	.181	.058	
2.0	.340	.186	.057	.328	.180	.056	.305	.170	.053	.284	.159	.050	.264	.149	.047	
3.0	.301	.160	.048	.290	.155	.047	.269	.146	.044	.250	.137	.042	.232	.128	.040	
4.0	.270	.140	.041	.260	.136	.040	.241	.128	.038	.224	.120	.036	.207	.113	.034	
5.0	.245	.125	.036	.236	.121	.035	.219	.114	.034	.203	.107	.032	.188	.100	.030	
6.0	.224	.112	.032	.216	.109	.031	.200	.102	.030	.185	.096	.028	.172	.090	.027	
7.0	.206	.102	.029	.199	.099	.028	.184	.093	.027	.171	.088	.026	.158	.082	.024	
8.0	.191	.093	.026	.184	.091	.026	.171	.085	.024	.159	.080	.023	.147	.075	.022	
9.0	.178	.086	.024	.171	.084	.023	.159	.079	.022	.148	.074	.021	.137	.070	.020	
10.0	.166	.080	.022	.160	.078	.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	.346	.346	.346	.295	.295	.295	.202	.202	.202	.116	.116	.116	.037	.037	.037	
1.0	.343	.312	.284	.293	.268	.245	.201	.184	.169	.115	.107	.098	.037	.034	.032	
2.0	.336	.289	.250	.288	.249	.216	.197	.172	.151	.114	.100	.088	.037	.032	.029	
3.0	.329	.273	.228	.282	.235	.198	.194	.164	.139	.112	.096	.082	.036	.031	.027	
4.0	.321	.261	.214	.275	.225	.186	.189	.157	.131	.110	.092	.078	.035	.030	.026	
5.0	.313	.251	.205	.269	.217	.178	.185	.152	.126	.107	.089	.075	.035	.029	.025	
6.0	.306	.243	.198	.263	.210	.172	.181	.147	.122	.105	.087	.072	.034	.028	.024	
7.0	.299	.236	.193	.257	.205	.168	.178	.144	.119	.103	.085	.071	.033	.028	.023	
8.0	.292	.231	.189	.251	.200	.165	.174	.141	.117	.101	.083	.070	.033	.027	.023	
9.0	.286	.226	.186	.246	.196	.162	.171	.138	.115	.099	.081	.069	.032	.027	.023	
10.0	.280	.222	.184	.241	.193	.160	.167	.136	.114	.098	.080	.068	.032	.026	.023	

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:0.0860A P:18.20W PF:0.9120 Lamp Flux:2203.4lx1 lm										
NAME: 177-062_4000K					TYPE:18W			WEIGHT:		
DIM.:					SPEC.:4000K			SERIAL No.:1		
MFR.: Tronix Lighting					SUR.:0.0182			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	24.7	26.1	25.2	26.6	27.2	21.8	23.2	22.4	23.7	24.3
3H	27.5	28.8	28.1	29.4	30.0	23.3	24.6	23.9	25.2	25.8
4H	29.1	30.3	29.7	30.9	31.5	23.9	25.1	24.5	25.7	26.4
6H	30.8	31.9	31.4	32.5	33.2	24.4	25.5	25.0	26.1	26.8
8H	31.7	32.8	32.4	33.4	34.2	24.5	25.6	25.1	26.2	26.9
12H	32.8	33.9	33.4	34.5	35.2	24.5	25.6	25.2	26.2	26.9
4H 2H	25.2	26.4	25.8	27.0	27.7	23.2	24.4	23.8	25.0	25.7
3H	28.3	29.4	29.0	30.0	30.7	25.0	26.1	25.7	26.7	27.4
4H	30.1	31.0	30.7	31.7	32.4	25.9	26.8	26.5	27.5	28.3
6H	32.0	32.9	32.7	33.5	34.3	26.6	27.4	27.2	28.1	28.9
8H	33.1	33.9	33.8	34.6	35.4	26.8	27.6	27.5	28.3	29.1
12H	34.3	35.0	35.0	35.7	36.6	26.9	27.7	27.6	28.4	29.2
8H 4H	30.4	31.2	31.1	31.9	32.7	27.2	28.0	27.9	28.7	29.5
6H	32.7	33.3	33.4	34.1	34.9	28.3	29.0	29.0	29.7	30.5
8H	33.9	34.6	34.7	35.3	36.2	28.8	29.4	29.5	30.1	31.0
12H	35.4	36.0	36.2	36.7	37.6	29.2	29.7	29.9	30.5	31.4
12H 4H	30.4	31.2	31.1	31.9	32.7	27.6	28.4	28.3	29.1	29.9
6H	32.8	33.4	33.5	34.1	35.0	29.0	29.6	29.7	30.3	31.2
8H	34.2	34.7	34.9	35.5	36.4	29.7	30.2	30.4	31.0	31.9
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 / - 0.5				

CIE Pub.117 Corrected 2203 lm Total Lamp Luminous Flux.(8log(F/F0) = 2.7)

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:0.0860A P:18.20W PF:0.9120 Lamp Flux:2203.4lx1 lm		
NAME: 177-062_4000K	TYPE:18W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0182	PROTECTION ANGLE:

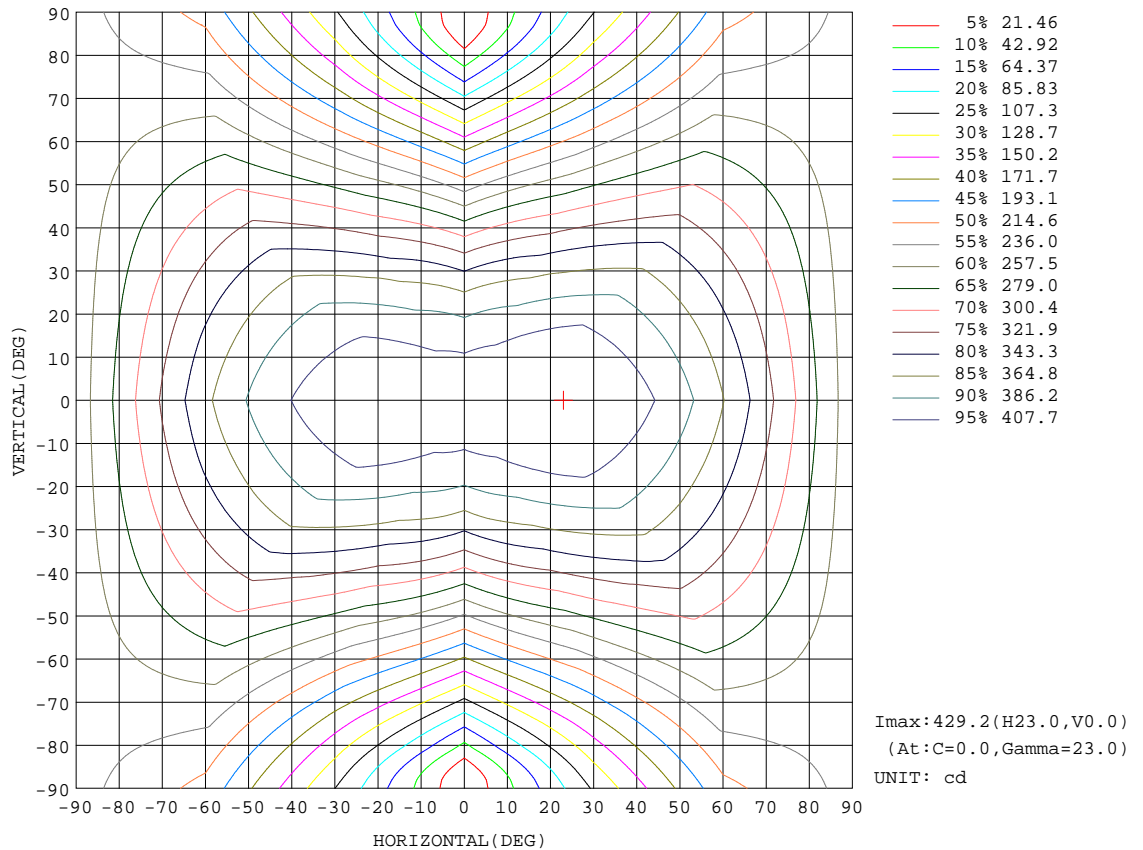
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
k = 0.60	46	34	26	45	33	26	43	32	26	19
0.80	55	42	34	54	41	33	51	40	33	24
1.00	63	50	41	61	49	40	57	49	39	30
1.25	70	57	48	67	55	47	63	53	45	35
1.50	75	62	54	72	61	52	67	57	50	39
2.00	82	71	62	79	69	61	73	65	58	46
2.50	87	76	68	83	74	66	77	69	63	49
3.00	91	81	73	87	78	71	80	73	67	53
4.00	96	87	80	91	84	78	84	78	73	58
5.00	99	91	85	94	88	82	86	81	77	61
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:0.0860A P:18.20W PF:0.9120 Lamp Flux:2203.4lx1 lm		
NAME: 177-062_4000K	TYPE:18W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0182	PROTECTION ANGLE:

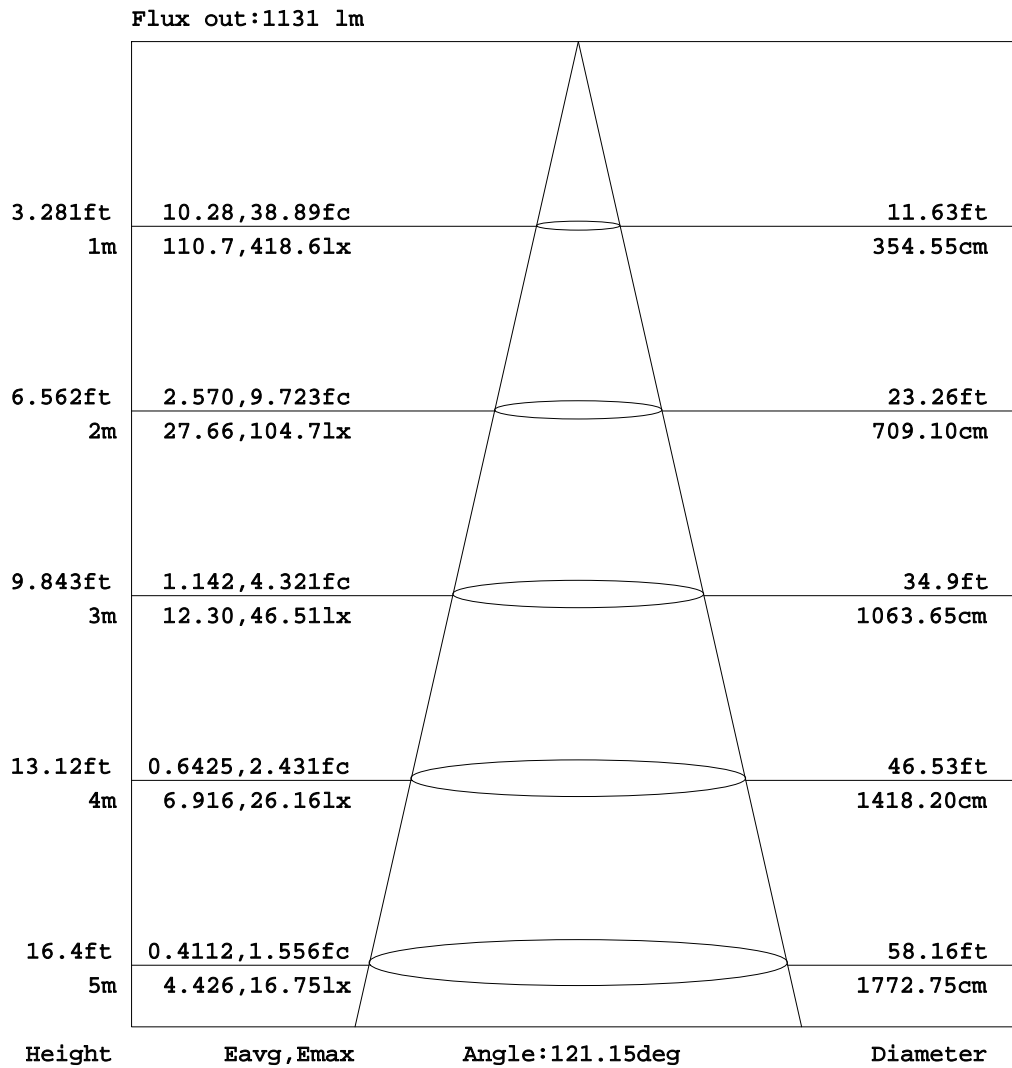


C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2019-12-05

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:0.0860A P:18.20W PF:0.9120 Lamp Flux:2203.4lx1 lm		
NAME: 177-062_4000K	TYPE:18W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0182	PROTECTION ANGLE:



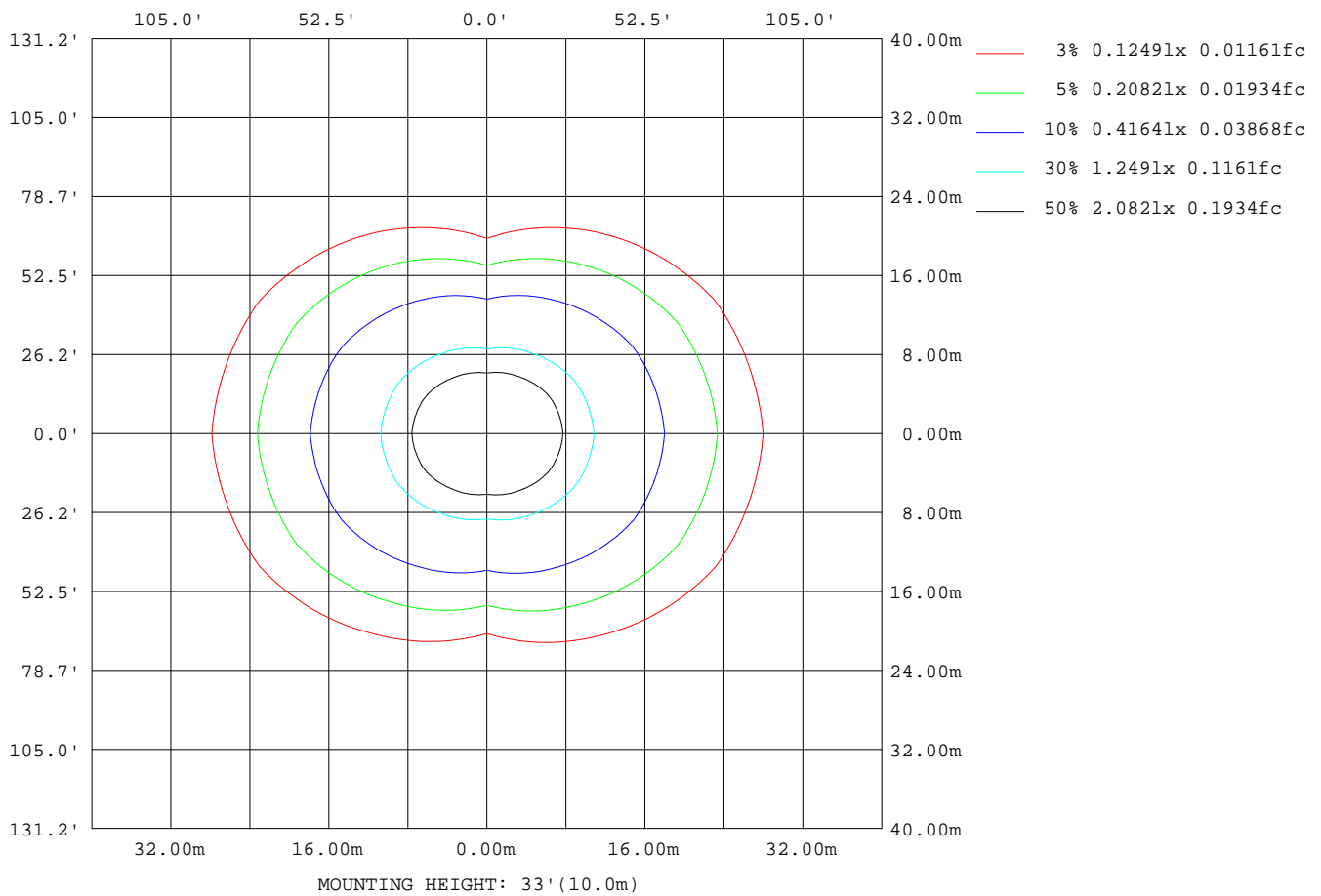
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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

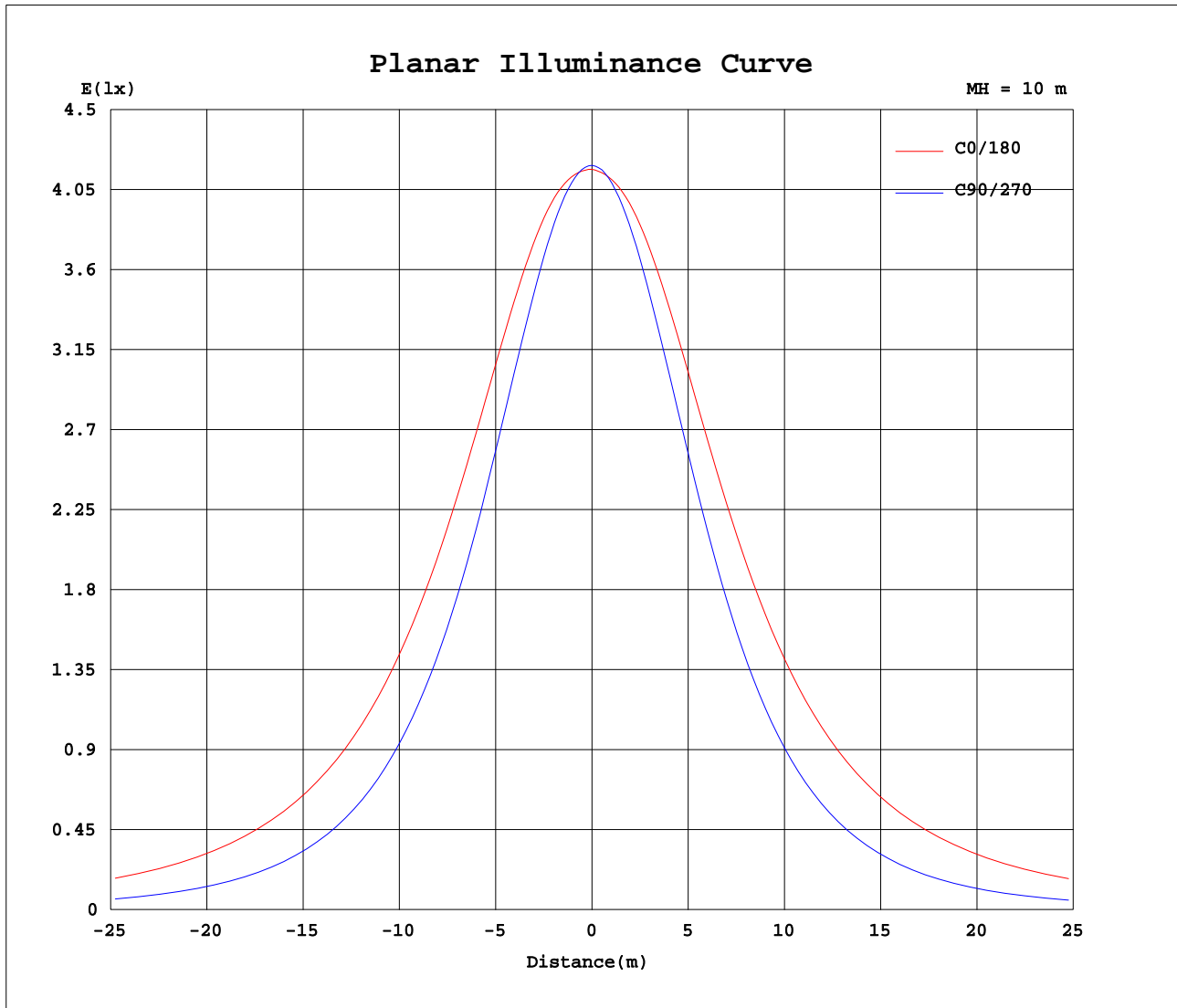
Test:U:230.2V I:0.0860A P:18.20W PF:0.9120 Lamp Flux:2203.4lx1 lm		
NAME: 177-062_4000K	TYPE:18W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0182	PROTECTION ANGLE:



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:0.0860A P:18.20W PF:0.9120 Lamp Flux:2203.4lx1 lm		
NAME: 177-062_4000K	TYPE:18W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.: Tronix Lighting	SUR.:0.0182	PROTECTION ANGLE:

Table--1

UNIT: cd

C(DEG) γ (DEG)	0	30	60	90	120	150	180	210	240	270	300	330							
0	418	418	418	418	418	418	418	418	418	418	418	418							
5	420	419	417	416	416	417	418	417	416	415	417	419							
10	424	421	414	410	412	418	421	418	412	409	413	420							
15	428	422	408	399	405	418	424	418	405	398	407	421							
20	430	422	399	385	396	416	425	416	395	383	398	420							
25	430	418	388	367	384	412	425	412	383	364	385	416							
30	428	413	373	344	369	406	422	405	368	342	371	410							
35	424	405	356	320	351	397	417	397	351	316	353	402							
40	417	394	337	293	332	386	410	386	331	288	333	391							
45	408	382	315	264	310	374	400	373	309	257	311	378							
50	396	367	292	233	287	359	389	358	287	225	288	363							
55	383	350	268	201	263	342	376	342	263	191	263	346							
60	367	331	243	169	238	324	361	325	238	157	239	328							
65	349	312	218	135	213	306	344	306	214	123	214	309							
70	330	292	194	102	189	287	326	287	190	88.9	190	289							
75	310	271	170	69.0	165	267	306	268	167	57.0	166	268							
80	288	250	148	39.2	144	247	286	247	146	28.7	144	247							
85	266	229	128	11.3	124	227	266	228	126	7.99	124	226							
90	244	208	110	1.56	107	207	245	208	110	2.09	107	205							
95	222	188	94.9	1.82	92.7	188	224	189	95.1	2.30	91.7	186							
100	201	170	79.7	2.21	80.5	170	203	170	82.8	2.60	73.0	167							
105	181	152	68.2	2.56	70.4	153	183	153	71.7	2.91	67.3	149							
110	161	135	57.0	2.97	61.2	136	164	136	61.7	3.25	56.5	133							
115	143	120	45.6	3.31	51.1	121	146	120	53.7	3.57	45.1	108							
120	127	97.5	37.8	3.69	43.5	107	129	106	45.6	3.90	37.1	89.3							
125	111	77.9	31.7	4.08	38.4	91.8	105	90.8	39.3	4.22	30.7	74.7							
130	95.7	62.6	26.6	4.41	33.4	78.3	91.0	76.4	34.5	4.54	25.9	61.4							
135	83.0	51.0	22.1	4.70	27.7	67.5	76.8	64.0	28.6	4.87	21.7	49.7							
140	70.8	41.1	18.3	5.01	23.1	57.0	61.8	53.8	23.4	5.18	17.9	40.3							
145	59.2	33.0	16.4	5.29	17.8	46.7	52.6	43.3	18.5	5.45	16.0	32.3							
150	48.3	25.6	15.2	5.57	14.5	36.0	43.7	33.8	15.3	5.71	15.0	25.3							
155	37.3	19.4	13.2	5.82	6.41	27.0	32.8	25.3	6.63	5.92	13.0	19.3							
160	28.3	16.0	6.42	6.00	6.31	19.1	20.9	18.3	6.32	6.10	6.22	16.1							
165	14.5	13.0	6.26	6.21	6.39	7.05	8.92	6.64	6.42	6.26	6.23	13.0							
170	6.52	6.45	6.38	6.39	6.48	6.62	6.46	6.51	6.48	6.37	6.36	6.41							
175	6.51	6.48	6.47	6.46	6.52	6.59	6.52	6.54	6.53	6.47	6.46	6.47							
180	6.55	6.52	6.55	6.50	6.53	6.54	6.55	6.54	6.53	6.52	6.54	6.55							

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: