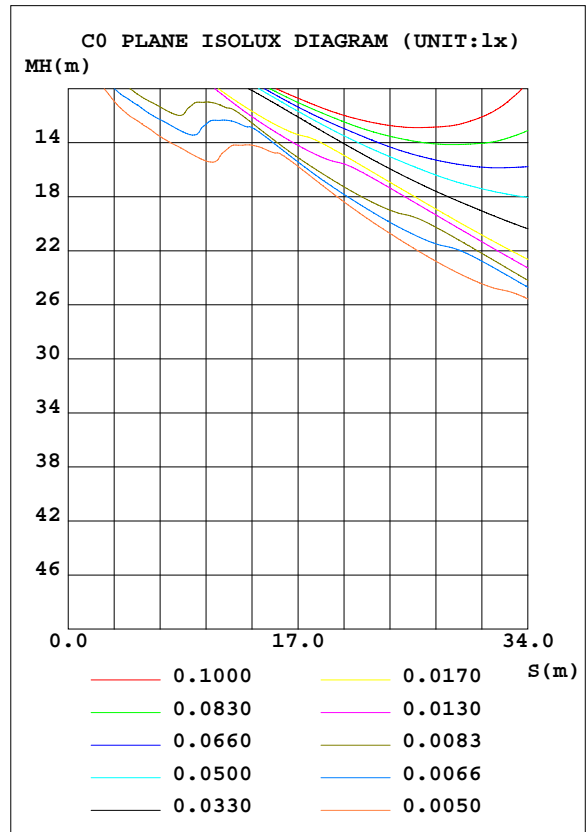
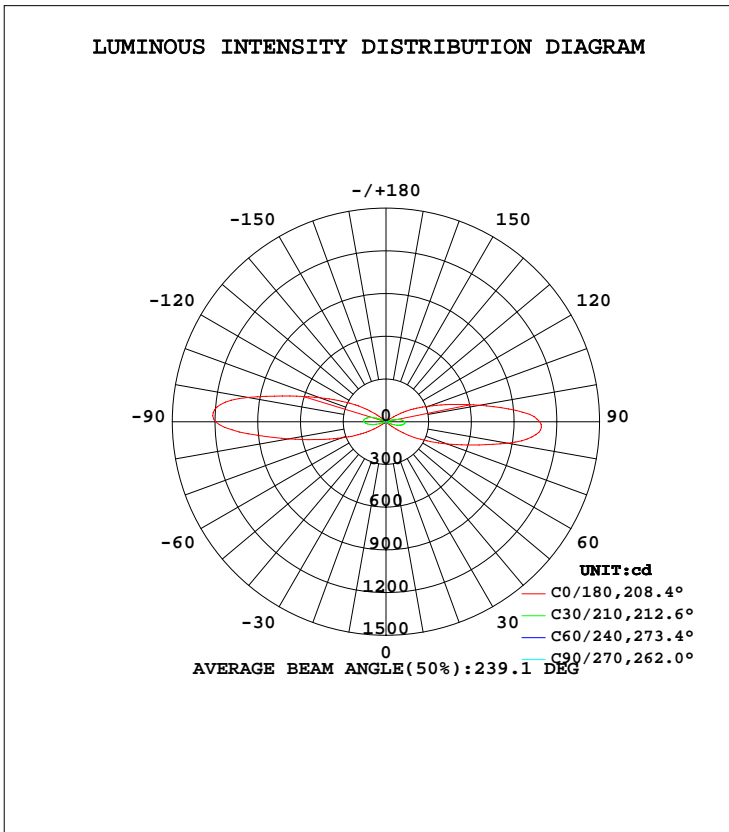


LUMINAIRE PHOTOMETRIC TEST REPORT

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 69.58 lm/W			
MODEL	Libero SUD -12W	Imax(cd)	1217	S/MH(C0/180)	0.00
NOMINAL POWER(W)	12	LOR(%)	66.5	S/MH(C90/270)	0.00
RATED VOLTAGE(V)	220	TOTAL FLUX(lm)	841.97	η UP, DN(C0-180)	17.9,16.2
NOMINAL FLUX(lm)	1267	CIE CLASS	DIFFUSE	η UP, DN(C180-360)	15.6,16.6
LAMPS INSIDE	1	η up(%)	33.6	CIBSE SHR NOM	0.00
TEST VOLTAGE(V)	219.9	η down(%)	32.9	CIBSE SHR MAX	1.00



C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DOBAC  
 Test Date:2017-11-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
 Humidity:65.0%  
 Test Distance:6.960m [K=1.0000]  
 Remarks:

**ZONAL FLUX DIAGRAM**

ZONAL FLUX DIAGRAM:

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	$\%lum, lamp$
10	0.1853	0.0483	0.0349	0.3602	0.5254	0.3380	0.0349	0.0650	0- 10	0.0101	0.0101	0.00,0.00
20	0.8419	0.4387	0.0445	0.7098	1.169	0.6838	0.0020	0.5142	10- 20	0.1095	0.1196	0.01,0.01
30	1.589	0.8366	0.0446	1.247	2.110	1.149	0.0019	0.9424	20- 30	0.3621	0.4817	0.06,0.04
40	2.270	1.341	0.0407	1.827	3.087	1.699	0	1.523	30- 40	0.7842	1.266	0.15,0.10
50	9.684	1.856	0.0407	2.163	29.84	2.100	0	2.053	40- 50	1.859	3.125	0.37,0.25
60	118.5	2.094	0.0387	3.420	208.6	2.593	0	2.416	50- 60	13.61	16.73	1.99,1.32
70	332.7	2.547	0.0271	6.713	455.5	4.825	0	4.172	60- 70	58.75	75.49	8.97,5.96
80	695.6	4.580	0.0271	9.626	870.0	6.414	0.0077	6.171	70- 80	130.9	206.4	24.5,16.3
90	1197	6.307	0.0116	10.66	1080	6.673	0.0136	4.882	80- 90	210.1	416.5	49.5,32.9
100	984.0	5.978	0.0077	7.840	669.7	5.302	0.0174	7.977	90-100	211.0	627.5	74.5,49.5
110	493.5	3.776	0	4.787	323.3	2.904	0.0291	6.136	100-110	135.2	762.7	90.6,60.2
120	222.9	2.405	0	2.443	121.5	2.192	0.0136	3.237	110-120	61.32	824.1	97.9,65
130	35.07	1.986	0	1.956	9.568	1.818	0.0116	2.181	120-130	14.82	838.9	99.6,66.2
140	2.888	1.704	0	1.406	2.405	1.251	0.0194	1.899	130-140	1.867	840.7	99.9,66.4
150	2.107	1.099	0.0077	0.8359	1.624	0.7513	0.0309	1.220	140-150	0.7603	841.5	99.9,66.4
160	1.093	0.6741	0.0135	0.4629	0.7509	0.4222	0.0368	0.7194	150-160	0.3499	841.9	100,66.4
170	0.5351	0.3053	0	0.0699	0.2124	0.0657	0.0368	0.3311	160-170	0.1046	842.0	100,66.5
180	0	0	0	0	0	0	0	0	170-180	0.0091	842.0	100,66.5
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

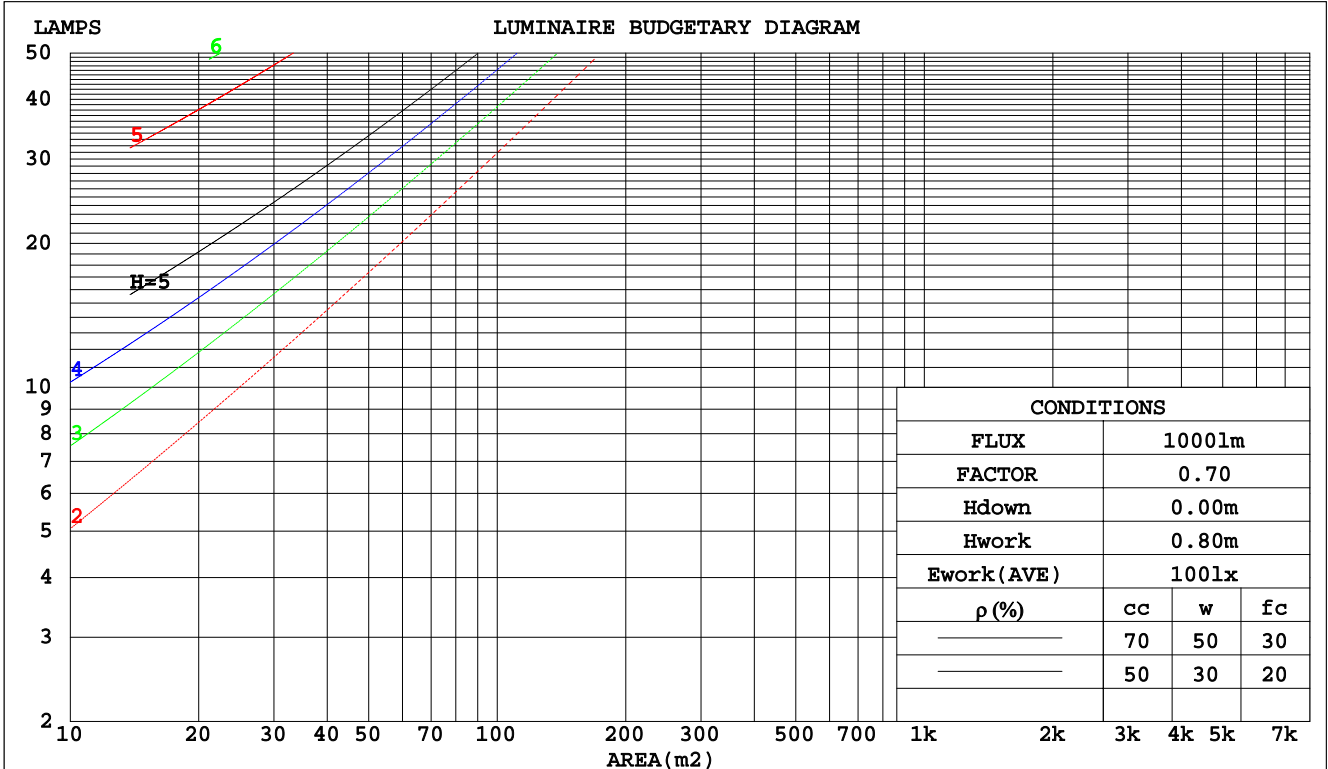
C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:DOBAC  
Test Date:2017-11-27

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
Test System:EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
Humidity:65.0%  
Test Distance:6.960m [K=1.0000]  
Remarks:

**CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM**

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	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																
pfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Coefficients of Utilization(CU)									
0.0	.71	.71	.71	.66	.66	.66	.55	.55	.55	.46	.46	.46	.37	.37	.37	.33
1.0	.51	.46	.41	.46	.41	.37	.37	.33	.29	.28	.25	.23	.21	.18	.16	.12
2.0	.42	.35	.29	.37	.31	.26	.29	.24	.20	.22	.18	.15	.15	.12	.09	.06
3.0	.35	.28	.22	.31	.25	.20	.25	.19	.15	.18	.14	.10	.12	.09	.06	.03
4.0	.30	.23	.18	.27	.21	.16	.21	.16	.12	.16	.11	.08	.10	.07	.04	.02
5.0	.27	.20	.15	.24	.18	.13	.19	.14	.10	.14	.10	.07	.09	.06	.03	.01
6.0	.24	.17	.12	.21	.15	.11	.17	.12	.08	.12	.08	.05	.08	.05	.03	.01
7.0	.21	.15	.10	.19	.13	.09	.15	.10	.07	.11	.07	.05	.08	.05	.02	.00
8.0	.19	.13	.09	.17	.12	.08	.14	.09	.06	.10	.07	.04	.07	.04	.02	.00
9.0	.18	.12	.08	.16	.11	.07	.13	.08	.05	.09	.06	.03	.07	.04	.02	.00
10.0	.16	.11	.07	.15	.10	.06	.12	.07	.05	.09	.05	.03	.06	.03	.02	.00



C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators: DOBAC  
 Test Date: 2017-11-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System: EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
 Humidity: 65.0%  
 Test Distance: 6.960m [K=1.0000]  
 Remarks:

WEC AND CCEC

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	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	.395	.224	.071	.379	.216	.069	.351	.201	.064	.324	.187	.060	.300	.174	.056	
2.0	.294	.161	.049	.280	.154	.047	.253	.141	.044	.229	.129	.040	.207	.117	.037	
3.0	.240	.128	.038	.227	.122	.037	.203	.110	.033	.181	.099	.030	.160	.089	.027	
4.0	.204	.106	.031	.193	.101	.030	.171	.091	.027	.150	.081	.024	.131	.071	.022	
5.0	.179	.091	.026	.168	.086	.025	.148	.077	.023	.129	.068	.020	.112	.060	.018	
6.0	.160	.080	.023	.150	.076	.022	.131	.067	.020	.114	.059	.017	.098	.051	.015	
7.0	.144	.071	.020	.135	.067	.019	.118	.060	.017	.102	.052	.015	.087	.045	.013	
8.0	.132	.064	.018	.123	.061	.017	.107	.054	.015	.092	.047	.014	.078	.040	.012	
9.0	.121	.059	.016	.114	.055	.016	.099	.049	.014	.085	.042	.012	.072	.036	.011	
10.0	.112	.054	.015	.105	.051	.014	.091	.045	.013	.078	.039	.011	.066	.033	.010	

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	.382	.382	.382	.327	.327	.327	.223	.223	.223	.128	.128	.128	.041	.041	.041	
1.0	.391	.360	.332	.334	.309	.286	.229	.213	.198	.132	.123	.115	.042	.040	.037	
2.0	.387	.347	.313	.332	.299	.270	.227	.207	.189	.131	.120	.111	.042	.039	.036	
3.0	.382	.337	.302	.328	.291	.262	.225	.202	.184	.130	.118	.108	.042	.038	.035	
4.0	.376	.330	.295	.323	.285	.256	.222	.199	.181	.128	.116	.107	.041	.038	.035	
5.0	.370	.324	.291	.318	.281	.253	.219	.196	.179	.127	.115	.106	.041	.038	.035	
6.0	.364	.320	.287	.313	.277	.250	.216	.194	.177	.125	.114	.105	.040	.037	.035	
7.0	.359	.316	.285	.309	.274	.248	.213	.192	.176	.124	.113	.105	.040	.037	.035	
8.0	.354	.312	.283	.305	.271	.247	.211	.190	.175	.123	.112	.104	.040	.037	.035	
9.0	.350	.309	.282	.301	.268	.246	.209	.189	.174	.122	.111	.104	.039	.037	.034	
10.0	.346	.306	.280	.298	.266	.245	.207	.187	.174	.121	.111	.104	.039	.036	.034	

C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DOBAC  
 Test Date:2017-11-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
 Humidity:65.0%  
 Test Distance:6.960m [K=1.0000]  
 Remarks:

Uncorrected UGR Table

NAME: Libero SUD -12W		TYPE:LED					WEIGHT:				
DIM.:		SPEC.:					SERIAL No.:				
MFR.: DOBAC		SUR.:					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	21.2	22.4	22.0	23.3	24.5	-9.7	-8.5	-8.8	-7.6	-6.4	
3H	31.9	33.0	32.8	34.0	35.2	-8.6	-7.5	-7.7	-6.6	-5.3	
4H	36.5	37.6	37.4	38.6	39.8	-8.3	-7.2	-7.4	-6.3	-5.0	
6H	41.3	42.3	42.2	43.3	44.6	-8.2	-7.1	-7.2	-6.2	-4.9	
8H	43.8	44.8	44.7	45.8	47.1	-8.1	-7.1	-7.2	-6.1	-4.8	
12H	46.6	47.5	47.5	48.5	49.8	-8.0	-7.1	-7.1	-6.1	-4.8	
4H 2H	20.6	21.7	21.5	22.7	23.9	4.6	5.6	5.5	6.6	7.9	
3H	31.6	32.5	32.5	33.5	34.8	4.4	5.4	5.3	6.3	7.7	
4H	36.5	37.4	37.5	38.4	39.7	4.3	5.2	5.3	6.2	7.6	
6H	41.7	42.5	42.6	43.5	44.9	4.3	5.1	5.2	6.1	7.4	
8H	44.4	45.2	45.4	46.2	47.6	4.2	5.0	5.2	6.0	7.4	
12H	47.5	48.2	48.4	49.2	50.6	4.1	4.9	5.1	5.9	7.3	
8H 4H	36.2	37.0	37.2	38.0	39.4	20.1	20.9	21.1	21.9	23.3	
6H	41.5	42.2	42.5	43.3	44.6	19.9	20.6	20.9	21.7	23.0	
8H	44.5	45.1	45.5	46.2	47.5	19.8	20.5	20.8	21.5	22.9	
12H	47.8	48.4	48.8	49.5	50.9	19.7	20.3	20.8	21.4	22.8	
12H 4H	36.1	36.9	37.1	37.9	39.3	25.3	26.0	26.3	27.1	28.4	
6H	41.4	42.1	42.4	43.1	44.5	25.2	25.8	26.2	26.8	28.2	
8H	44.4	45.0	45.4	46.0	47.4	25.1	25.6	26.1	26.7	28.1	
Variations with the observer position at spacings:											
S = 1.0H	+ 0.2 / - 0.2					+ 0.4 / - 0.6					
1.5H	+ 0.4 / - 0.4					+ 0.8 / - 0.5					
2.0H	+ 0.6 / - 0.6					+ 2.3 / - 3.4					

CIE Pub.117 Corrected 1267 lm Total Lamp Luminous Flux.(8log(F/F0) = 0.8)

C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:DOBAC  
Test Date:2017-11-27

γ Range: 0 - 180DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
Humidity:65.0%  
Test Distance:6.960m [K=1.0000]  
Remarks:

UTILIZATION FACTORS TABLE

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	PROTECTION ANGLE:

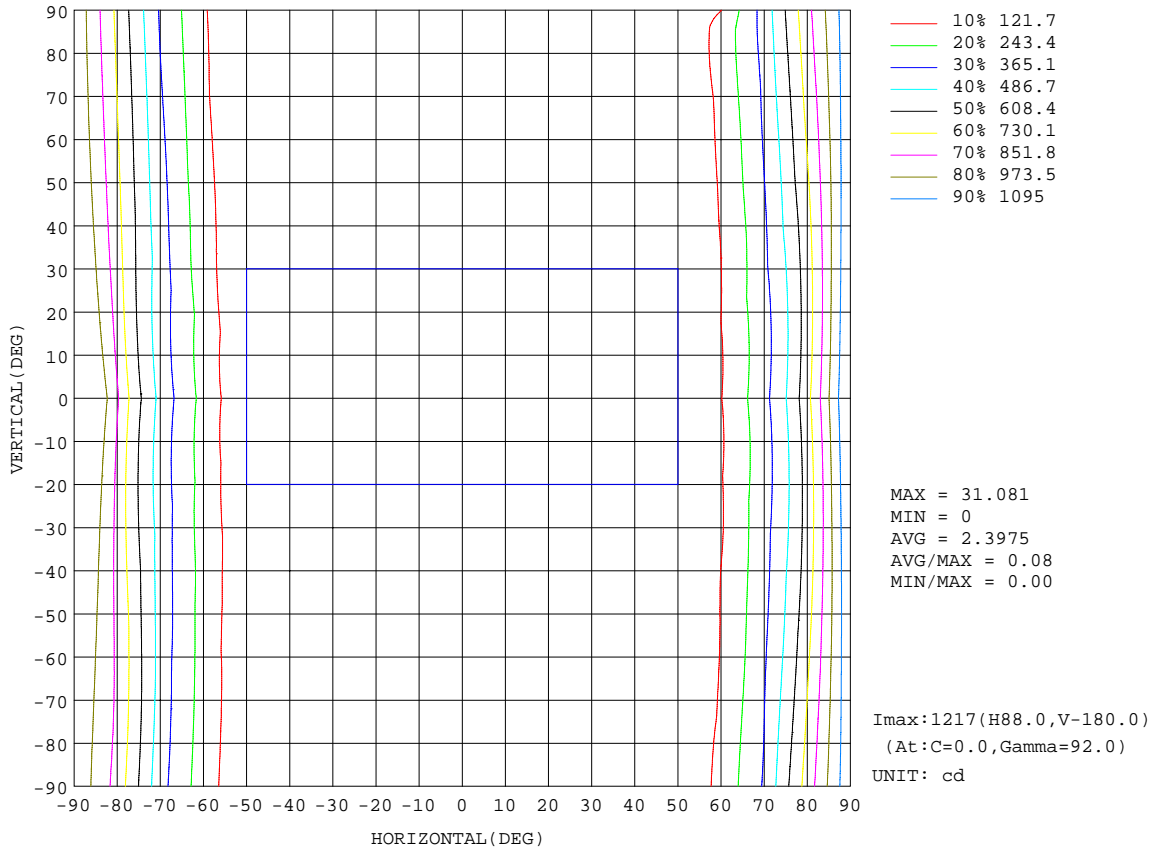
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) k(RI) x RCR = 5									
k = 0.60	20	11	5	19	10	5	17	9	5	0
0.80	24	14	7	23	13	7	20	12	6	1
1.00	28	16	9	26	16	9	23	15	8	1
1.25	32	20	12	29	19	11	25	16	10	1
1.50	35	23	15	32	21	14	27	18	12	2
2.00	40	28	20	37	26	18	31	22	15	4
2.50	44	32	24	40	30	22	33	25	19	6
3.00	46	36	28	43	33	25	35	28	21	7
4.00	51	41	33	46	38	31	38	32	26	10
5.00	53	45	38	49	41	35	40	34	29	12
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			

C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:DOBAC  
Test Date:2017-11-27

γ Range: 0 - 180DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
Humidity:65.0%  
Test Distance:6.960m [K=1.0000]  
Remarks:

ISOCANDELA DIAGRAM

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	PROTECTION ANGLE:

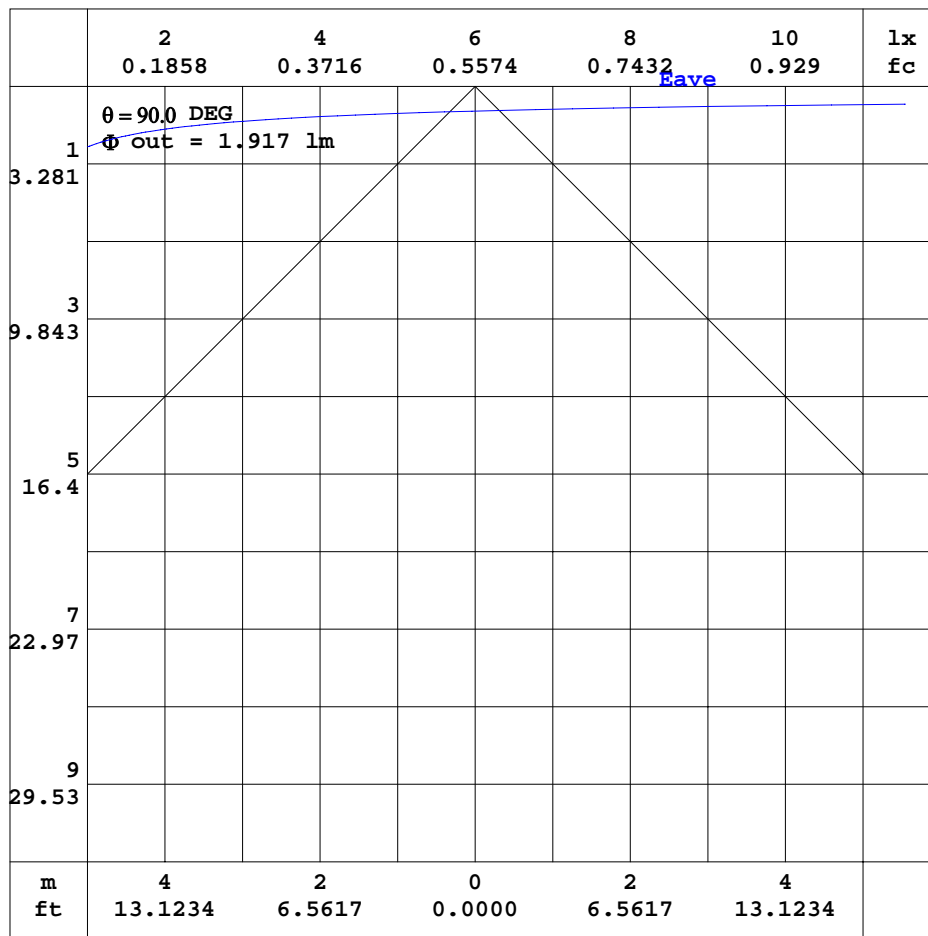


C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature: 25.3DEG  
Operators: DOBAC  
Test Date: 2017-11-27

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
Test System: EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
Humidity: 65.0%  
Test Distance: 6.960m [K=1.0000]  
Remarks:

AAI CURVES

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	PROTECTION ANGLE:



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

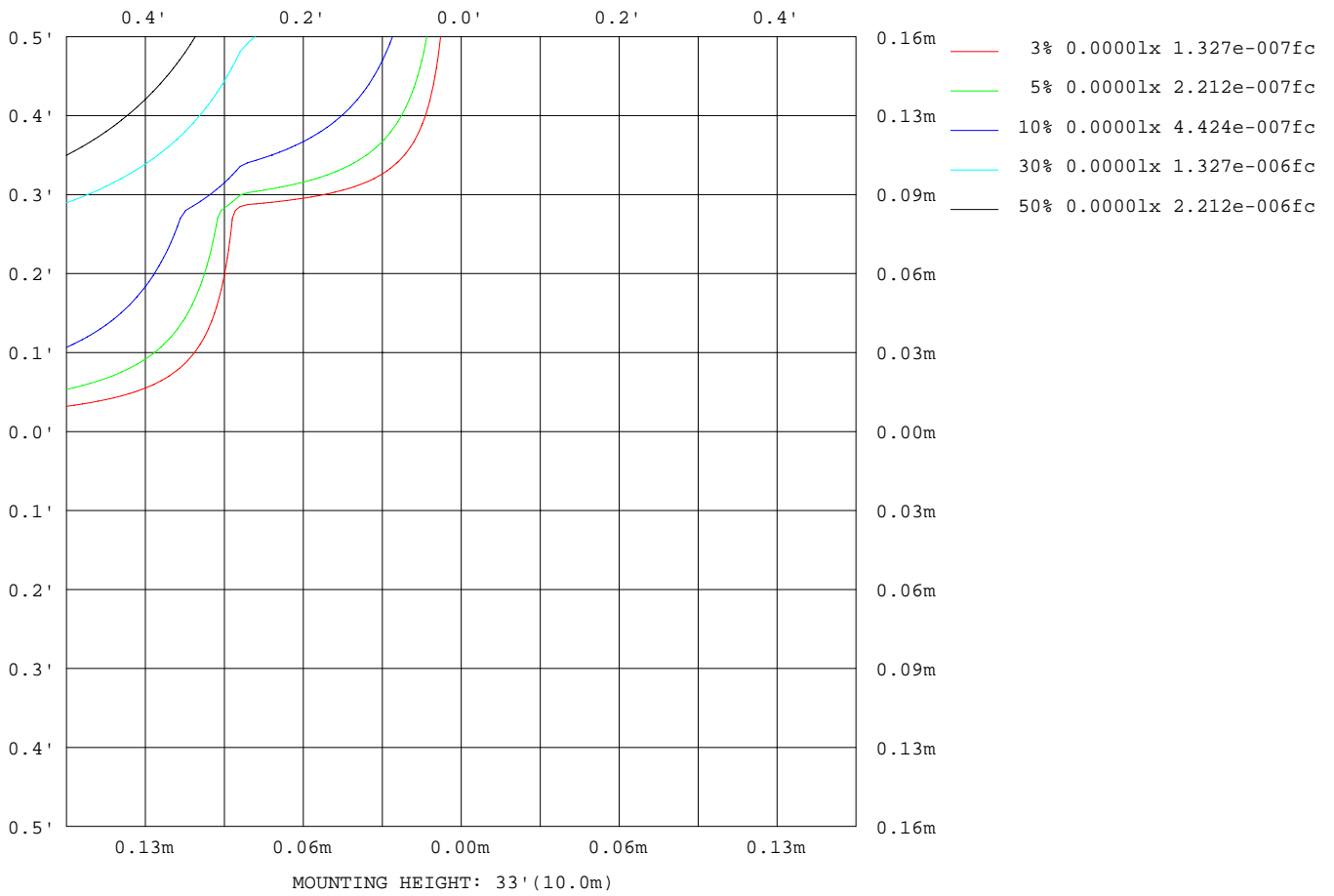
C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators: DOBAC  
 Test Date: 2017-11-27

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System: EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
 Humidity: 65.0%  
 Test Distance: 6.960m [K=1.0000]  
 Remarks:



ISOLUX DIAGRAM

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	PROTECTION ANGLE:



C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators: DOBAC  
 Test Date: 2017-11-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System: EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
 Humidity: 65.0%  
 Test Distance: 6.960m [K=1.0000]  
 Remarks:

**Average Luminance Table(CIBSE)**

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	PROTECTION ANGLE:

Parameter description for average Luminance	Symbol	Value	Unit
Luminance in Azimuth Plane	Bc	refer Table 2	cd/sq.m.
Intensity at angle Gamma in given azimuth plane	I	from data	cd/klm
Number of lamps	N	1	
Output of each lamp(initial lumens as specified)	F	1267	lm
Multiplying factor	K	1	
Luminous area in horizontal plane used in calculations	A	0.0038	sq.m.
Angle to the downward vertical from light centre	Gamma	from data	deg

Table 1. Calculation parameters for determination of CIBSE LG3:1996 Average Luminance

G deg	C plane(deg)																				
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180		
55	13778	7927	4168	1252	974	813	478	279	42	21	537	398	735	962	1206	4436	17077	2143	48035		
60	62363	44893	12520	2658	1185	1020	624	346	59	20	629	486	896	1152	2448	9455	53379	5134	109766		
65	13563	20962	6549	13	7489	1572	1252	833	444	89	19	760	608	1121	1409	4963	33626	108185	9494	197905	
70	25597	21036	12685	32	2006	2361	1559	1123	590	125	21	962	784	1466	1857	8473	74686	189583	1660835	0499	
75	49101	38940	23342	06	9868	4411	2076	1534	809	197	28	1262	1048	1977	2554	13630	137896	193192	95746	41141	
80	10542	12865	14435	61	6609	3106	96	3184	2380	1233	335	41	1896	1603	3029	4010	25165	246805	652995	7236	318472
85	29331	20191	1464	2306	2319	02	7861	6439	4807	2532	713	76	3716	3111	6117	8147	58151	53813	62288	18365	13188103

Table 2. Average Luminance(cd/sq.m.) for defined C plane,Gamma angle

CIBSE Category	Gamma (deg)	Average Luminance		Patch Luminance	
		maximum	specified	maximum	specified
		calculated	maximum	measured	maximum
Category 1	55 to 90	3188103	200	---	500
Category 2	65 to 90	3188103	200	---	500
Category 3	75 to 90	3188103	200	---	500

Table 3. Tabulation of Average and Patch Luminance(cd/sq.m.) for defined CIBSE categories

No match

C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:DOBAC  
Test Date:2017-11-27

γ Range: 0 - 180DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
Humidity:65.0%  
Test Distance:6.960m [K=1.0000]  
Remarks:

**Average Luminance Table(CIBSE)**

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	PROTECTION ANGLE:

Parameter description for average Luminance	Symbol	Value	Unit
Luminance in Azimuth Plane	Bc	refer Table 2	cd/sq.m.
Intensity at angle Gamma in given azimuth plane	I	from data	cd/klm
Number of lamps	N	1	
Output of each lamp(initial lumens as specified)	F	1267	lm
Multiplying factor	K	1	
Luminous area in horizontal plane used in calculations	A	0.0038	sq.m.
Angle to the downward vertical from light centre	Gamma	from data	deg

Table 1. Calculation parameters for determination of CIBSE LG3:2001 Average Luminance

G deg	C plane(deg)																				
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180		
55	13778	7927	4168	1252	974	813	478	279	42	21	537	398	735	962	1206	4436	17077	2143	48035		
60	62363	44893	12520	2658	1185	1020	624	346	59	20	629	486	896	1152	2448	9455	53379	5134	109766		
65	13563	20962	6549	13748	1572	1252	833	444	89	19	760	608	1121	1409	4963	33626	108185	9494	197905		
70	25597	21036	12685	32200	62361	1559	1123	590	125	21	962	784	1466	1857	8473	74686	189583	166083	50499		
75	49101	38940	23342	69868	4411	2076	1534	809	197	28	1262	1048	1977	2554	13630	137896	193192	95746	41141		
80	10542	12865	14435	16609	3106	9631	84	2380	1233	335	41	1896	1603	3029	4010	25165	246805	652995	72363	18472	
85	29331	20191	14642	3062	3190	27861	6439	4807	2532	713	76	3716	3111	6117	8147	58151	53813	62288	18365	14188	103

Table 2. Average Luminance(cd/sq.m.) for defined C plane,Gamma angle

range (deg)	Maximum measured	Average Luminance(cd/sq.m)			
		Maximum limit for screen type & software category used			
		Type I,II screen Some neg.s'ware	Type I,II screen Only pos.s'ware	Type III screen Some neg.s'ware	Type III screen Only pos.s'ware
55 to 90	3188103	1000	1500	200	500
65 to 90	3188103	1000	1500	200	500

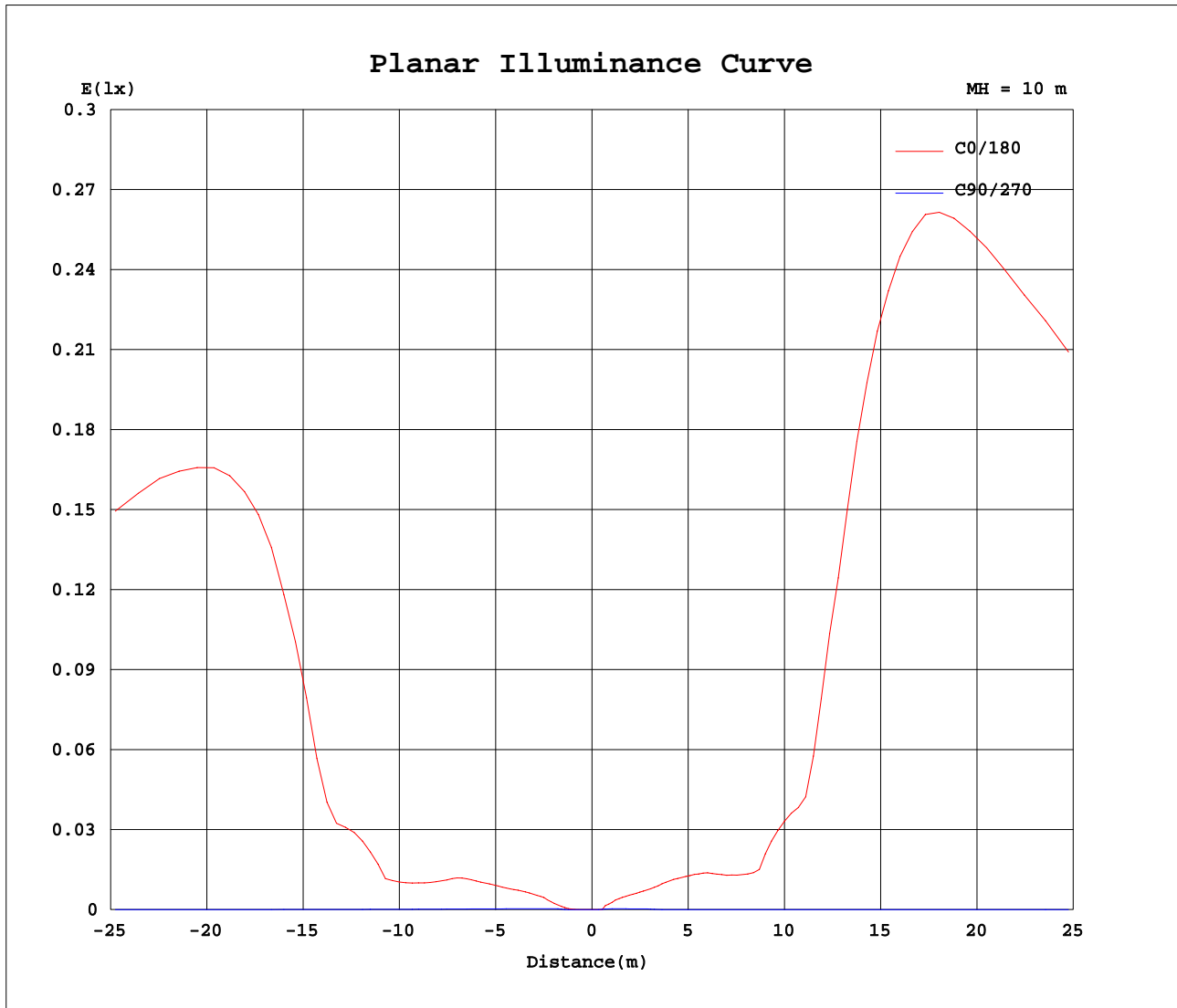
Table 3. Tabulation of average luminance(cd/sq.m.) and luminance limits

No match

C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:DOBAC  
Test Date:2017-11-27

γ Range: 0 - 180DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
Humidity:65.0%  
Test Distance:6.960m [K=1.0000]  
Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators: DOBAC  
 Test Date: 2017-11-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System: EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
 Humidity: 65.0%  
 Test Distance: 6.960m [K=1.0000]  
 Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	PROTECTION ANGLE:

Table--1

UNIT: cd

C( DEG) γ (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.01	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.17	0.19	0.01	0.21
10	0.19	0.16	0.14	0.10	0.06	0.04	0.01	0.00	0.00	0.03	0.18	0.14	0.23	0.32	0.40	0.44	0.48	0.03	0.53
15	0.56	0.53	0.50	0.37	0.26	0.14	0.05	0.03	0.00	0.04	0.27	0.24	0.40	0.50	0.59	0.66	0.72	0.04	0.78
20	0.84	0.83	0.75	0.65	0.54	0.34	0.15	0.05	0.00	0.04	0.40	0.38	0.52	0.65	0.77	0.90	1.03	0.0630	1.17
25	1.13	1.10	1.00	0.88	0.76	0.56	0.30	0.09	0.00	0.04	0.53	0.46	0.65	0.83	1.07	1.31	1.48	0.0888	1.63
30	1.59	1.53	1.41	1.18	0.94	0.73	0.49	0.15	0.02	0.04	0.64	0.54	0.76	1.06	1.43	1.67	1.88	0.1142	2.11
35	2.16	2.12	1.89	1.59	1.23	0.89	0.61	0.24	0.04	0.04	0.79	0.62	0.91	1.36	1.73	2.05	2.14	0.1249	2.35
40	2.27	2.22	2.15	1.99	1.63	1.06	0.70	0.33	0.04	0.04	0.99	0.68	1.09	1.63	2.03	2.15	2.41	0.1536	3.09
45	2.93	2.63	2.29	2.15	1.92	1.35	0.80	0.45	0.05	0.04	1.06	0.74	1.29	1.82	2.13	2.47	4.55	0.4386	9.39
50	9.68	6.65	3.05	2.26	2.11	1.61	0.89	0.54	0.07	0.04	1.12	0.79	1.47	2.03	2.30	4.56	10.8	1.11	29.8
55	30.0	17.3	9.08	2.73	2.12	1.77	1.04	0.61	0.09	0.05	1.17	0.87	1.60	2.10	2.63	9.67	37.2	4.67	105
60	118	85.3	23.8	5.05	2.25	1.94	1.19	0.66	0.11	0.04	1.20	0.92	1.70	2.19	4.65	18.0	101	9.75	209
65	218	176	88.2	12.0	2.52	2.01	1.34	0.71	0.14	0.03	1.22	0.98	1.80	2.26	7.97	54.0	174	15.2	318
70	333	273	165	28.6	3.07	2.03	1.46	0.77	0.16	0.03	1.25	1.02	1.91	2.41	11.0	97.1	246	21.6	456
75	483	383	230	68.7	4.34	2.04	1.51	0.80	0.19	0.03	1.24	1.03	1.94	2.51	13.4	136	314	29.1	631
80	696	519	293	110	7.06	2.10	1.57	0.81	0.22	0.03	1.25	1.06	2.00	2.65	16.6	163	373	37.8	870
85	971	669	345	140	9.23	2.13	1.59	0.84	0.24	0.03	1.23	1.03	2.03	2.70	19.3	178	407	45.2	1056
90	1197	782	378	155	10.5	2.16	1.64	0.85	0.26	0.01	1.19	1.01	2.01	2.66	18.7	178	406	45.8	1080
95	1191	792	380	156	10.7	2.18	1.64	0.86	0.27	0.01	1.16	0.96	1.96	2.60	15.7	165	370	39.2	918
100	984	691	351	143	9.73	2.23	1.64	0.85	0.28	0.01	1.11	0.93	1.90	2.49	13.2	139	311	30.4	670
105	699	545	299	118	7.86	2.21	1.62	0.83	0.28	0.00	1.08	0.89	1.74	2.37	10.5	101	245	22.4	469
110	494	406	237	81.0	5.33	2.22	1.56	0.79	0.27	0.00	0.99	0.84	1.63	2.31	7.27	54.7	177	15.9	323
115	340	288	166	38.6	3.30	2.12	1.53	0.77	0.26	0.00	0.97	0.79	1.51	2.25	3.88	17.7	108	10.6	215
120	223	186	94.5	13.2	2.73	2.08	1.50	0.72	0.25	0.00	0.78	0.73	1.37	2.19	2.70	9.95	38.3	5.68	122
125	117	93.8	31.7	6.57	2.33	2.02	1.42	0.71	0.24	0.00	0.67	0.67	1.24	1.97	2.35	4.61	11.6	1.36	34.2
130	35.1	21.9	9.67	2.94	2.09	1.88	1.26	0.66	0.22	0.00	0.54	0.61	1.06	1.71	2.20	2.62	4.88	0.4824	9.57
135	9.29	7.00	3.12	2.29	2.01	1.71	1.07	0.63	0.20	0.00	0.41	0.54	0.90	1.44	1.96	2.21	2.54	0.1697	3.15
140	2.89	2.65	2.28	2.05	1.92	1.49	0.88	0.57	0.17	0.00	0.29	0.47	0.75	1.18	1.64	2.03	2.20	0.1303	2.40
145	2.22	2.16	2.07	2.01	1.67	1.19	0.76	0.51	0.15	0.00	0.20	0.40	0.62	0.93	1.30	1.64	1.87	0.1162	2.13
150	2.11	2.08	1.92	1.67	1.28	0.91	0.67	0.45	0.13	0.01	0.14	0.27	0.53	0.71	0.96	1.25	1.46	0.0901	1.62
155	1.63	1.58	1.41	1.21	0.95	0.74	0.57	0.34	0.10	0.01	0.08	0.17	0.41	0.56	0.70	0.87	1.00	0.0632	1.14
160	1.09	1.07	0.98	0.85	0.73	0.62	0.48	0.25	0.09	0.01	0.05	0.08	0.23	0.41	0.52	0.62	0.67	0.04	0.75
165	0.76	0.75	0.72	0.65	0.57	0.48	0.31	0.16	0.06	0.01	0.00	0.02	0.10	0.20	0.33	0.40	0.45	0.03	0.50
170	0.54	0.53	0.49	0.45	0.35	0.26	0.16	0.08	0.04	0.00	0.00	0.00	0.03	0.05	0.09	0.14	0.18	0.01	0.21
175	0.18	0.17	0.16	0.14	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.00	0.01
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: 10.0DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:DOBAC  
Test Date:2017-11-27

γ Range: 0 - 180DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
Humidity:65.0%  
Test Distance:6.960m [K=1.0000]  
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

NAME: Libero SUD -12W	TYPE:LED	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: DOBAC	SUR.:	PROTECTION ANGLE:

Table--2

UNIT: cd

C( DEG) γ (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
5	0.22	0.19	0.17	0.14	0.11	0.09	0.06	0.05	0.03	0.01	0.00	0.00	0.00	0.01	0.01	0.03	0.00		
10	0.52	0.49	0.44	0.38	0.29	0.19	0.11	0.06	0.03	0.01	0.00	0.03	0.04	0.09	0.13	0.16	0.01		
15	0.76	0.71	0.65	0.57	0.48	0.37	0.20	0.08	0.03	0.01	0.05	0.09	0.19	0.31	0.44	0.53	0.03		
20	1.14	1.01	0.88	0.74	0.63	0.48	0.29	0.10	0.00	0.07	0.07	0.22	0.43	0.60	0.72	0.80	0.05		
25	1.58	1.44	1.26	0.99	0.77	0.60	0.40	0.12	0.00	0.11	0.15	0.42	0.66	0.82	0.96	1.06	0.0643		
30	2.07	1.86	1.62	1.33	0.97	0.69	0.47	0.15	0.00	0.14	0.26	0.60	0.84	1.04	1.29	1.46	0.0901		
35	2.30	2.18	2.05	1.62	1.22	0.80	0.52	0.17	0.00	0.19	0.40	0.75	1.00	1.38	1.76	1.99	0.1244		
40	2.91	2.47	2.19	1.96	1.44	0.93	0.58	0.21	0.00	0.26	0.53	0.89	1.27	1.78	2.15	2.26	0.1336		
45	8.02	4.03	2.48	2.18	1.65	1.07	0.64	0.23	0.00	0.36	0.62	0.99	1.59	2.09	2.27	2.55	0.1643		
50	18.4	10.0	3.31	2.30	1.90	1.21	0.69	0.25	0.00	0.47	0.70	1.15	1.90	2.21	2.57	3.81	0.4781		
55	77.0	25.0	8.10	2.59	2.12	1.30	0.72	0.27	0.00	0.61	0.75	1.34	2.10	2.32	3.54	11.0	1.14		
60	170	75.9	12.4	3.00	2.19	1.38	0.73	0.28	0.00	0.75	0.83	1.56	2.19	2.65	8.86	31.7	5.36		
65	267	147	30.3	5.22	2.24	1.44	0.73	0.28	0.00	0.88	0.88	1.72	2.29	3.34	14.3	96.6	10.5		
70	371	218	63.0	7.33	2.32	1.50	0.76	0.28	0.00	1.03	0.96	1.83	2.31	6.03	46.0	170	16.2		
75	492	277	96.0	9.16	2.34	1.54	0.75	0.28	0.00	1.11	1.01	1.88	2.33	8.99	88.8	248	22.9		
80	610	325	120	10.4	2.38	1.57	0.76	0.27	0.01	1.29	1.01	0.85	1.23	11.1	127	316	31.2		
85	694	352	132	11.0	2.40	1.60	0.77	0.27	0.01	1.23	0.97	1.91	2.43	10.5	157	376	40.0		
90	702	351	132	10.9	2.43	1.60	0.76	0.26	0.01	1.35	1.04	1.99	2.60	7.16	120	413	46.2		
95	622	324	119	10.1	2.38	1.56	0.75	0.25	0.01	1.36	1.08	2.02	2.54	5.50	65.7	400	45.9		
100	492	276	93.7	8.23	2.37	1.51	0.73	0.23	0.02	1.34	1.10	2.11	2.65	13.3	157	365	39.2		
105	365	217	61.0	6.06	2.25	1.43	0.70	0.21	0.02	1.35	1.09	2.11	2.51	11.8	132	325	30.8		
110	261	151	25.1	3.60	2.21	1.33	0.66	0.19	0.03	1.32	1.06	2.00	2.34	9.93	91.6	257	22.9		
115	170	84.3	11.1	2.85	2.14	1.24	0.63	0.16	0.03	1.32	1.00	1.96	2.18	7.48	49.3	181	16.1		
120	85.1	23.3	6.19	2.42	1.96	1.13	0.58	0.10	0.01	1.30	0.93	1.85	2.08	4.39	18.1	105	10.4		
125	17.4	9.18	2.94	2.29	1.72	1.01	0.54	0.02	0.01	1.18	0.88	1.78	2.11	2.73	9.81	38.6	5.10		
130	7.08	3.19	2.44	2.17	1.46	0.86	0.49	0.07	0.01	1.06	0.82	1.56	2.12	2.25	4.26	11.4	1.28		
135	2.80	2.48	2.27	1.86	1.27	0.74	0.43	0.05	0.02	0.97	0.75	1.31	1.99	2.11	2.45	4.17	0.4404		
140	2.33	2.27	1.98	1.51	0.99	0.64	0.37	0.04	0.02	0.86	0.72	0.89	1.70	2.10	2.11	2.38	0.1553		
145	2.06	1.86	1.55	1.20	0.79	0.55	0.27	0.02	0.02	0.72	0.63	0.89	1.13	1.88	2.09	2.08	0.1228		
150	1.55	1.39	1.13	0.86	0.65	0.45	0.17	0.01	0.03	0.58	0.56	0.77	1.03	1.41	1.80	2.03	0.1189		
155	1.06	0.95	0.79	0.66	0.51	0.35	0.10	0.00	0.03	0.45	0.47	0.66	0.80	0.43	1.26	1.46	0.0894		
160	0.71	0.67	0.58	0.48	0.36	0.18	0.05	0.00	0.04	0.33	0.33	0.55	0.66	0.78	0.88	1.02	0.0600		
165	0.47	0.44	0.38	0.28	0.16	0.07	0.02	0.00	0.04	0.22	0.21	0.38	0.52	0.61	0.65	0.72	0.04		
170	0.19	0.17	0.12	0.08	0.05	0.01	0.00	0.00	0.04	0.14	0.12	0.20	0.28	0.38	0.46	0.50	0.03		
175	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.10	0.05	0.07	0.10	0.12	0.15	0.17	0.01		
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	0.01	0.01	0.00		

C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:DOBAC  
Test Date:2017-11-27

γ Range: 0 - 180DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000B\_V1 SYSTEM V1.0.260  
Humidity:65.0%  
Test Distance:6.960m [K=1.0000]  
Remarks: