

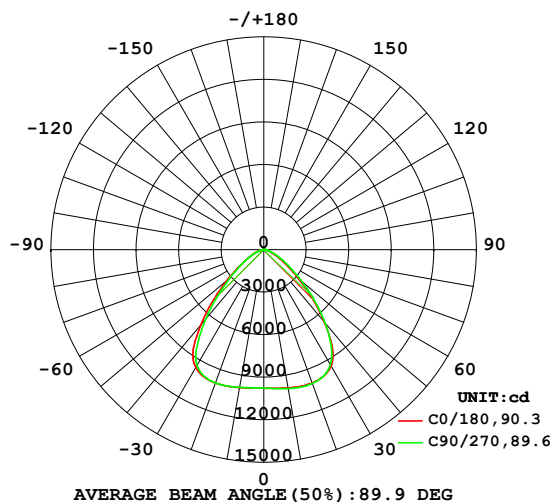
## GONIOPHOTOMETERS SYSTEM TEST REPORT

## LUMINAIRE PHOTOMETRIC TEST REPORT

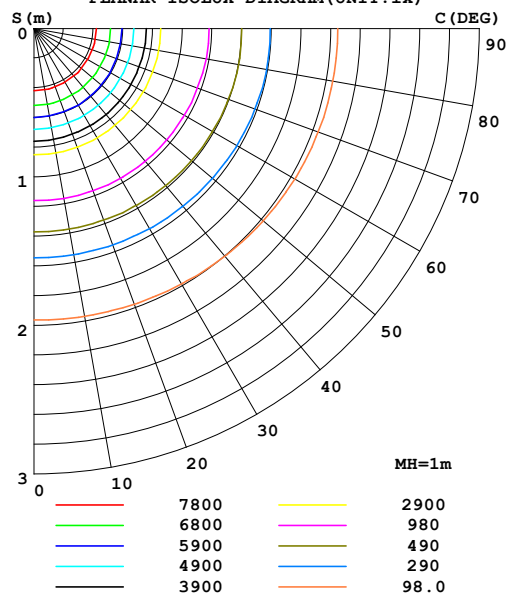
Test:U:229.96V I:0.6634A P:150.21W PF:0.9847 Freq:50.00Hz Lamp Flux:20611.3x1 lm		
NAME: HB38-150-5070-H00123	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.:	SUR.:φ0.246	Shielding Angle:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 137.22 lm/W			
MODEL	RF303	I <sub>max</sub> (cd)	10055	S/MH(C0/180)	1.29
NOMINAL POWER(W)	150	LOR(%)	100.0	S/MH(C90/270)	1.25
RATED VOLTAGE(V)	230	TOTAL FLUX(lm)	20611	η UP,DN(C0-180)	0.0,50.7
NOMINAL FLUX(lm)	20611.3	CIE CLASS	DIRECT	η UP,DN(C180-360)	0.0,49.3
LAMPS INSIDE	1	η up(%)	0.0	CIBSE SHR NOM	1.25
TEST VOLTAGE(V)	230	η down(%)	100.0	CIBSE SHR MAX	1.30

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



PLANAR ISOLUX DIAGRAM(UNIT:lx)



C Range: 0 - 360DEG  
C Interval: 2.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:WJH  
Test Date:2019-12-27

γ Range: 0 - 90DEG  
γ Interval: 0.5DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:9.432m [K=1.0000]  
Remarks:

Checker: LI

Assessor:

# GONIOPHOTOMETERS SYSTEM TEST REPORT

## ZONAL FLUX DIAGRAM

### ZONAL FLUX DIAGRAM:

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	%lum,lamp
10	989.9	993.6	994.8	992.8	987.9	986.0	986.1	987.9	0- 10	939.1	939.1	4.56,4.56
20	1000	1002	1004	1004	1001	1000	999.9	1000	10- 20	2831	3770	18.3,18.3
30	949.1	940.6	939.0	945.7	959.6	953.8	943.4	943.3	20- 30	4548	8318	40.4,40.4
40	662.2	670.1	672.2	675.6	689.5	658.6	635.6	638.2	30- 40	5142	13460	65.3,65.3
50	323.6	337.9	353.0	345.8	339.4	319.7	313.7	311.1	40- 50	3743	17203	83.5,83.5
60	135.9	149.7	161.8	153.8	145.0	144.4	139.5	134.0	50- 60	2018	19222	93.3,93.3
70	52.00	58.55	64.78	61.42	58.17	57.00	54.47	52.95	60- 70	949.8	20172	97.9,97.9
80	15.45	17.16	19.56	19.19	17.51	16.70	15.82	15.37	70- 80	364.3	20536	99.6,99.6
90	1.156	1.119	1.152	0.9959	0.9726	1.225	1.301	1.290	80- 90	75.39	20611	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:×10cd									UNIT:lm		

Conical surface Flux(90deg): 15579 lm

%lum = 75.6%

%lamp = 75.6%

Conical surface Flux(120deg): 19222 lm

%lum = 93.3%

%lamp = 93.3%

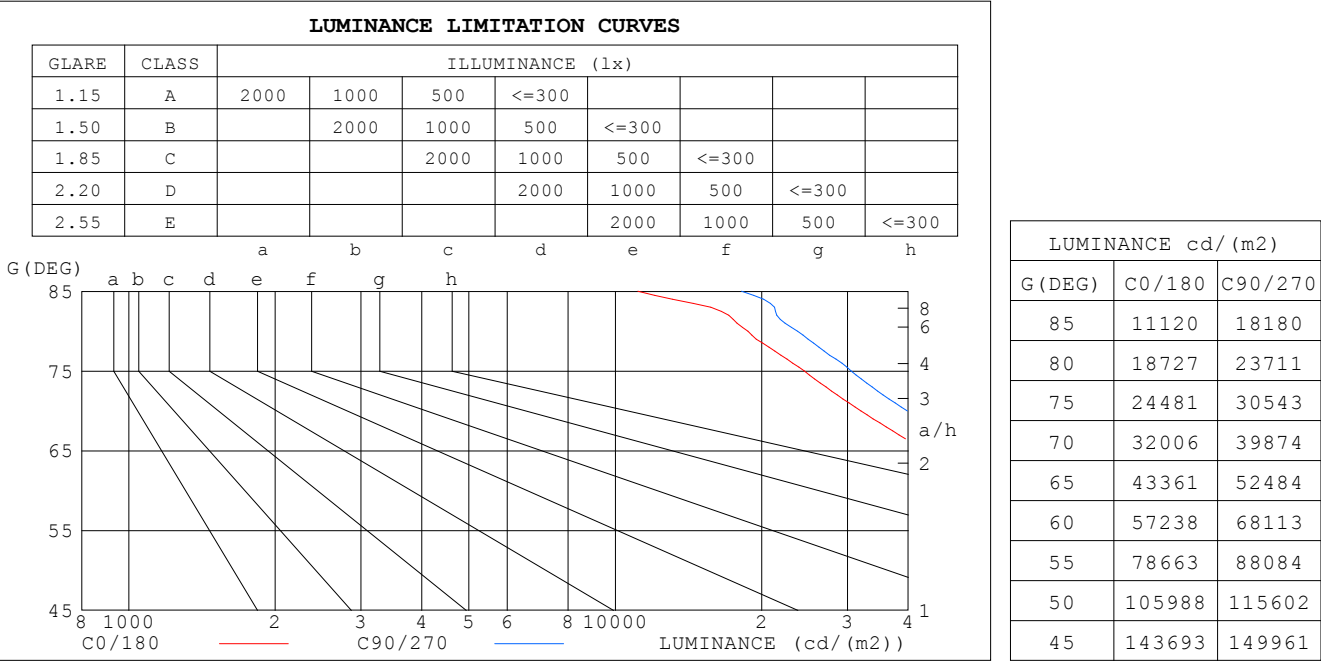
C Range: 0 - 360DEG  
C Interval: 2.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:WJH  
Test Date:2019-12-27

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 0.5DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:9.432m [K=1.0000]  
Remarks:

Checker: LI

Assessor:

LUMINANCE LIMITATION CURVES



C Range: 0 - 360DEG  
C Interval: 2.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:WJH  
Test Date:2019-12-27

Checker: LI

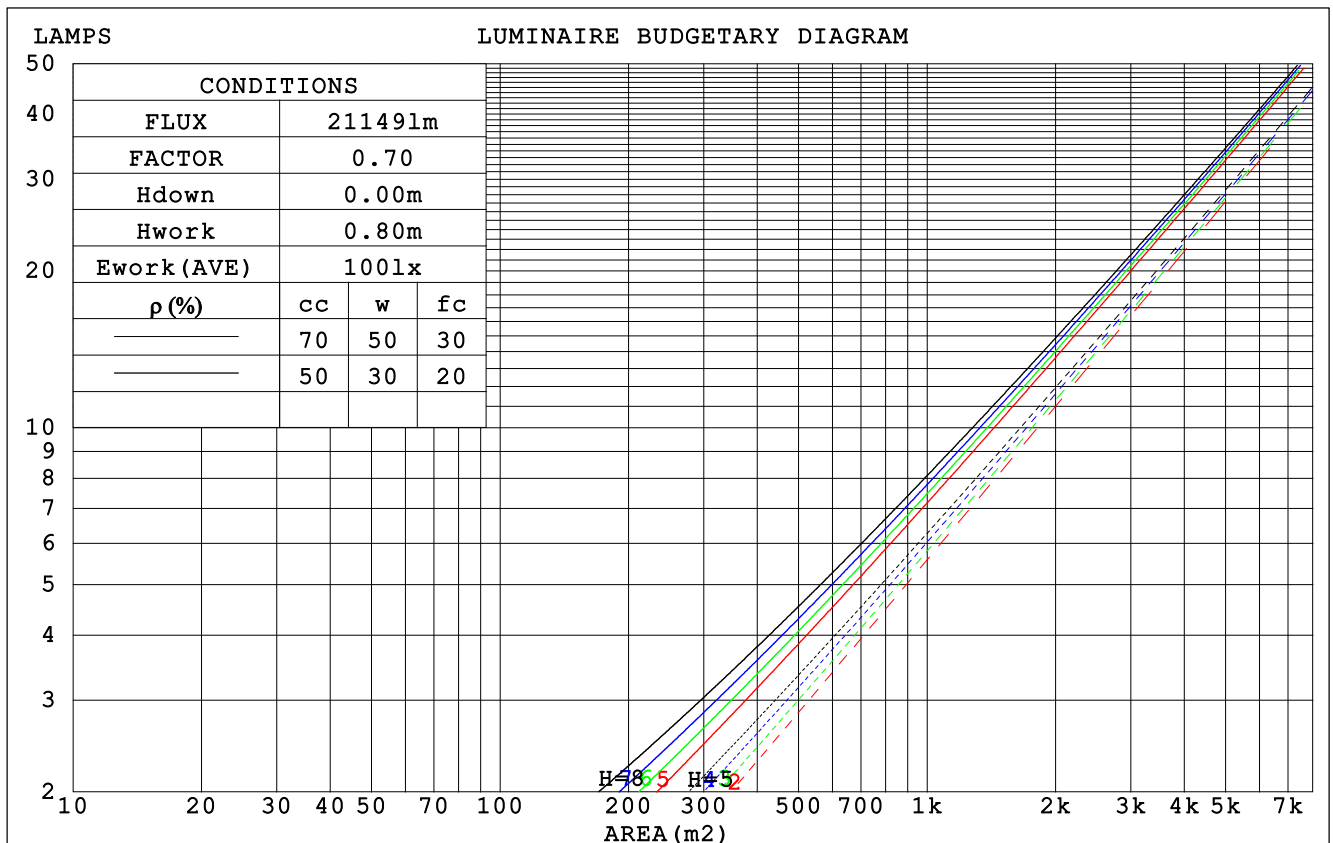
γ Range: 0 - 90DEG  
γ Interval: 0.5DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:9.432m [K=1.0000]  
Remarks:

Assessor:

# GONIOPHOTOMETERS SYSTEM TEST REPORT

## CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

pcc	80%			70%			50%			30%			10%			0
p <sub>w</sub>	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
p <sub>fc</sub>	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	1.08	1.04	1.02	1.06	1.03	.00	1.01	.99	.97	.98	.96	.94	.94	.93	.91	.89
2.0	.97	.92	.87	.95	.90	.86	.92	.88	.84	.89	.85	.82	.86	.83	.80	.79
3.0	.88	.81	.76	.86	.80	.75	.83	.78	.74	.81	.76	.72	.78	.74	.71	.69
4.0	.79	.72	.66	.78	.71	.66	.76	.70	.65	.73	.68	.64	.71	.67	.63	.62
5.0	.72	.64	.59	.71	.64	.58	.69	.63	.58	.67	.62	.57	.65	.61	.57	.55
6.0	.66	.58	.52	.65	.58	.52	.63	.57	.52	.62	.56	.51	.60	.55	.51	.49
7.0	.60	.53	.47	.59	.52	.47	.58	.51	.47	.57	.51	.46	.55	.50	.46	.44
8.0	.55	.48	.43	.55	.48	.43	.54	.47	.42	.52	.46	.42	.51	.46	.42	.40
9.0	.51	.44	.39	.51	.44	.39	.50	.43	.39	.49	.43	.38	.48	.42	.38	.37
10.0	.48	.40	.36	.47	.40	.35	.46	.40	.35	.45	.39	.35	.44	.39	.35	.33



C Range: 0 - 360DEG  
C Interval: 2.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:WJH  
Test Date:2019-12-27

γ Range: 0 - 90DEG  
γ Interval: 0.5DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:9.432m [K=1.0000]  
Remarks:

Checker: LI

Assessor:

# GONIOPHOTOMETERS SYSTEM TEST REPORT

## WEC AND CCEC

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	.236	.134	.042	.229	.131	.041	.216	.124	.040	.204	.118	.038	.193	.112	.036		
2.0	.229	.125	.038	.223	.123	.038	.212	.118	.037	.202	.113	.035	.192	.109	.034		
3.0	.218	.116	.035	.213	.114	.034	.203	.110	.033	.194	.106	.033	.186	.103	.032		
4.0	.206	.107	.031	.202	.105	.031	.193	.102	.031	.185	.099	.030	.178	.097	.029		
5.0	.195	.099	.029	.191	.098	.028	.183	.095	.028	.176	.093	.028	.169	.091	.027		
6.0	.184	.092	.026	.180	.091	.026	.173	.089	.026	.167	.087	.026	.161	.085	.025		
7.0	.174	.086	.024	.171	.085	.024	.165	.083	.024	.159	.081	.024	.154	.080	.023		
8.0	.164	.080	.023	.162	.080	.022	.156	.078	.022	.151	.077	.022	.146	.075	.022		
9.0	.156	.075	.021	.153	.075	.021	.149	.073	.021	.144	.072	.021	.140	.071	.020		
10.0	.148	.071	.020	.146	.070	.020	.141	.069	.020	.137	.068	.019	.133	.067	.019		

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	.190	.190	.190	.163	.163	.163	.111	.111	.111	.064	.064	.064	.020	.020	.020	
1.0	.175	.157	.140	.150	.135	.121	.103	.093	.083	.059	.054	.049	.019	.017	.016	
2.0	.164	.132	.106	.140	.114	.091	.096	.079	.064	.055	.046	.037	.018	.015	.012	
3.0	.154	.114	.082	.132	.098	.071	.091	.068	.050	.052	.040	.029	.017	.013	.010	
4.0	.146	.100	.065	.125	.086	.056	.086	.060	.040	.050	.035	.023	.016	.011	.008	
5.0	.139	.089	.052	.119	.077	.046	.082	.054	.032	.048	.032	.019	.015	.010	.006	
6.0	.132	.080	.043	.114	.070	.038	.078	.049	.027	.045	.029	.016	.015	.009	.005	
7.0	.126	.073	.037	.108	.064	.032	.075	.045	.023	.043	.026	.013	.014	.009	.004	
8.0	.120	.068	.031	.103	.059	.027	.072	.041	.019	.042	.024	.012	.013	.008	.004	
9.0	.115	.063	.027	.099	.054	.024	.069	.038	.017	.040	.023	.010	.013	.007	.003	
10.0	.110	.058	.024	.095	.051	.021	.066	.036	.015	.038	.021	.009	.012	.007	.003	

C Range: 0 - 360DEG  
 C Interval: 2.5DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:WJH  
 Test Date:2019-12-27

γ Range: 0 - 90DEG  
 γ Interval: 0.5DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity:65.0%  
 Test Distance:9.432m [K=1.0000]  
 Remarks:

Checker: LI

Assessor:

# GONIOPHOTOMETERS SYSTEM TEST REPORT

## UGR(Unified Glare Rating) Table

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	27.5	28.8	27.8	29.0	29.2	27.8	29.1	28.1	29.3	29.5
3H	27.7	28.9	28.0	29.1	29.3	28.1	29.3	28.4	29.5	29.7
4H	27.7	28.8	28.0	29.1	29.3	28.2	29.3	28.5	29.5	29.8
6H	27.7	28.7	28.0	29.0	29.3	28.2	29.2	28.5	29.5	29.7
8H	27.7	28.7	28.0	29.0	29.2	28.2	29.2	28.5	29.4	29.7
12H	27.6	28.6	28.0	28.9	29.2	28.1	29.1	28.5	29.4	29.7
4H 2H	27.6	28.7	27.9	28.9	29.2	27.9	29.0	28.2	29.2	29.5
3H	27.9	28.8	28.2	29.1	29.4	28.3	29.2	28.6	29.5	29.8
4H	28.0	28.8	28.3	29.1	29.5	28.4	29.3	28.8	29.6	29.9
6H	28.0	28.8	28.4	29.1	29.5	28.5	29.2	28.8	29.6	29.9
8H	28.0	28.7	28.4	29.1	29.4	28.5	29.2	28.9	29.5	29.9
12H	28.0	28.6	28.4	29.0	29.4	28.5	29.1	28.9	29.5	29.9
8H 4H	27.9	28.7	28.4	29.0	29.4	28.4	29.1	28.8	29.4	29.8
6H	28.0	28.6	28.5	29.0	29.4	28.5	29.0	28.9	29.4	29.9
8H	28.0	28.5	28.5	29.0	29.4	28.5	29.0	29.0	29.4	29.9
12H	28.0	28.5	28.5	28.9	29.4	28.5	29.0	29.0	29.4	29.9
12H 4H	27.9	28.6	28.3	28.9	29.3	28.3	29.0	28.7	29.3	29.7
6H	28.0	28.5	28.5	28.9	29.4	28.4	29.0	28.9	29.4	29.8
8H	28.0	28.5	28.5	28.9	29.4	28.5	28.9	29.0	29.4	29.8
Variations with the observer position at spacings:										
S = 1.0H	+ 1.1 / - 1.7					+ 1.0 / - 1.3				
1.5H	+ 1.1 / - 1.1					+ 0.9 / - 0.9				
2.0H	+ 2.4 / - 2.0					+ 2.1 / - 1.8				

CIE Pub.117, 20611 lm Total Lamp Luminous Flux Corrected ( $8\log(F/F_0) = 10.5$ )  
Area: 0.0475 m<sup>2</sup>

C Range: 0 - 360DEG  
C Interval: 2.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:WJH  
Test Date:2019-12-27

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 0.5DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:9.432m [K=1.0000]  
Remarks:

Checker: LI

Assessor:

# GONIOPHOTOMETERS SYSTEM TEST REPORT

## UTILIZATION FACTORS TABLE

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) $k(RI) \times RCR = 5$									
$k = 0.60$	70	60	54	69	60	54	68	59	54	49
0.80	79	70	64	78	70	64	77	69	64	58
1.00	87	78	73	86	78	73	84	79	72	66
1.25	93	85	80	92	84	79	89	83	79	73
1.50	97	90	85	96	89	84	93	87	83	77
2.00	102	96	91	101	95	91	98	93	89	83
2.50	105	99	95	103	98	94	100	95	92	85
3.00	107	102	98	105	101	97	102	98	95	88
4.00	110	106	103	108	104	101	104	101	99	91
5.00	112	108	105	110	106	104	105	103	101	92
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		

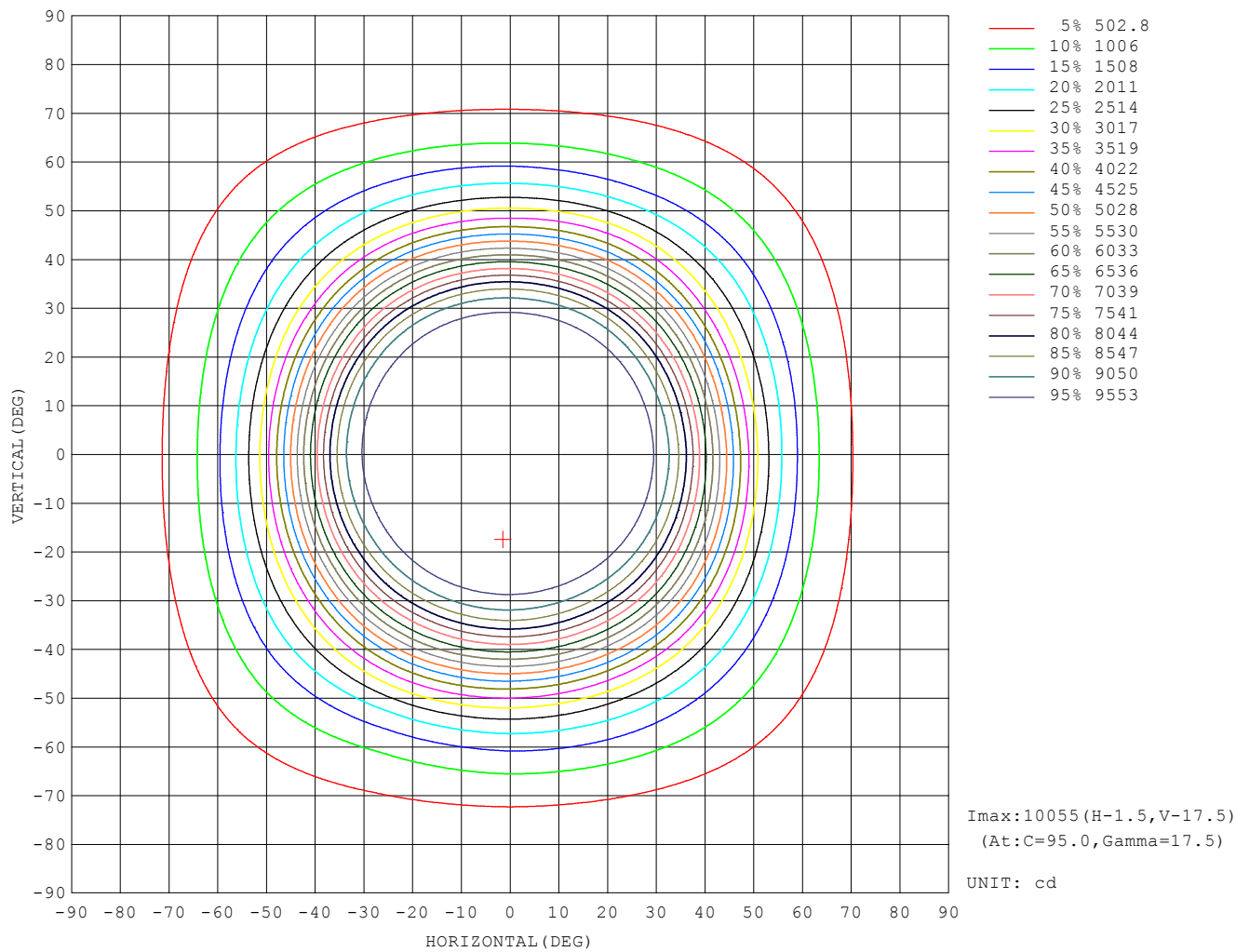
C Range: 0 - 360DEG  
 C Interval: 2.5DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators: WJH  
 Test Date: 2019-12-27

Checker: LI

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 0.5DEG  
 Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity: 65.0%  
 Test Distance: 9.432m [K=1.0000]  
 Remarks:

Assessor:

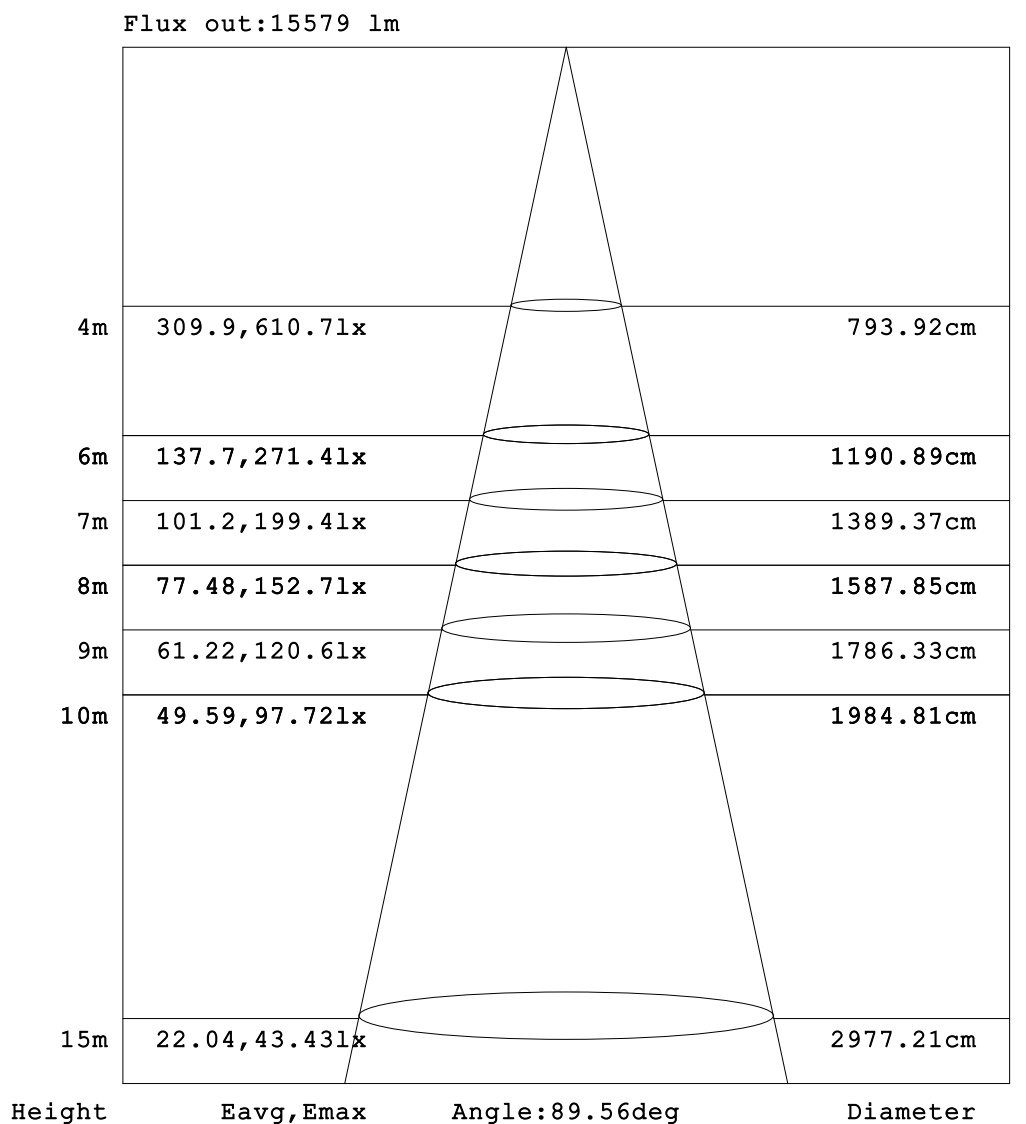
ISOCANDELA DIAGRAM



C Range: 0 - 360DEG	$\gamma$ Range: 0 - 90DEG
C Interval: 2.5DEG	$\gamma$ Interval: 0.5DEG
Test Speed: HIGH	Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.295
Temperature:25.3DEG	Humidity:65.0%
Operators:WJH	Test Distance:9.432m [K=1.0000]
Test Date:2019-12-27	Remarks:
Checker: LI	Assessor:



## AAI Figure



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

C Range: 0 - 360DEG  
C Interval: 2.5DEG  
Test Speed: HIGH  
Temperature: 25.3DEG  
Operators: WJH  
Test Date: 2019-12-27

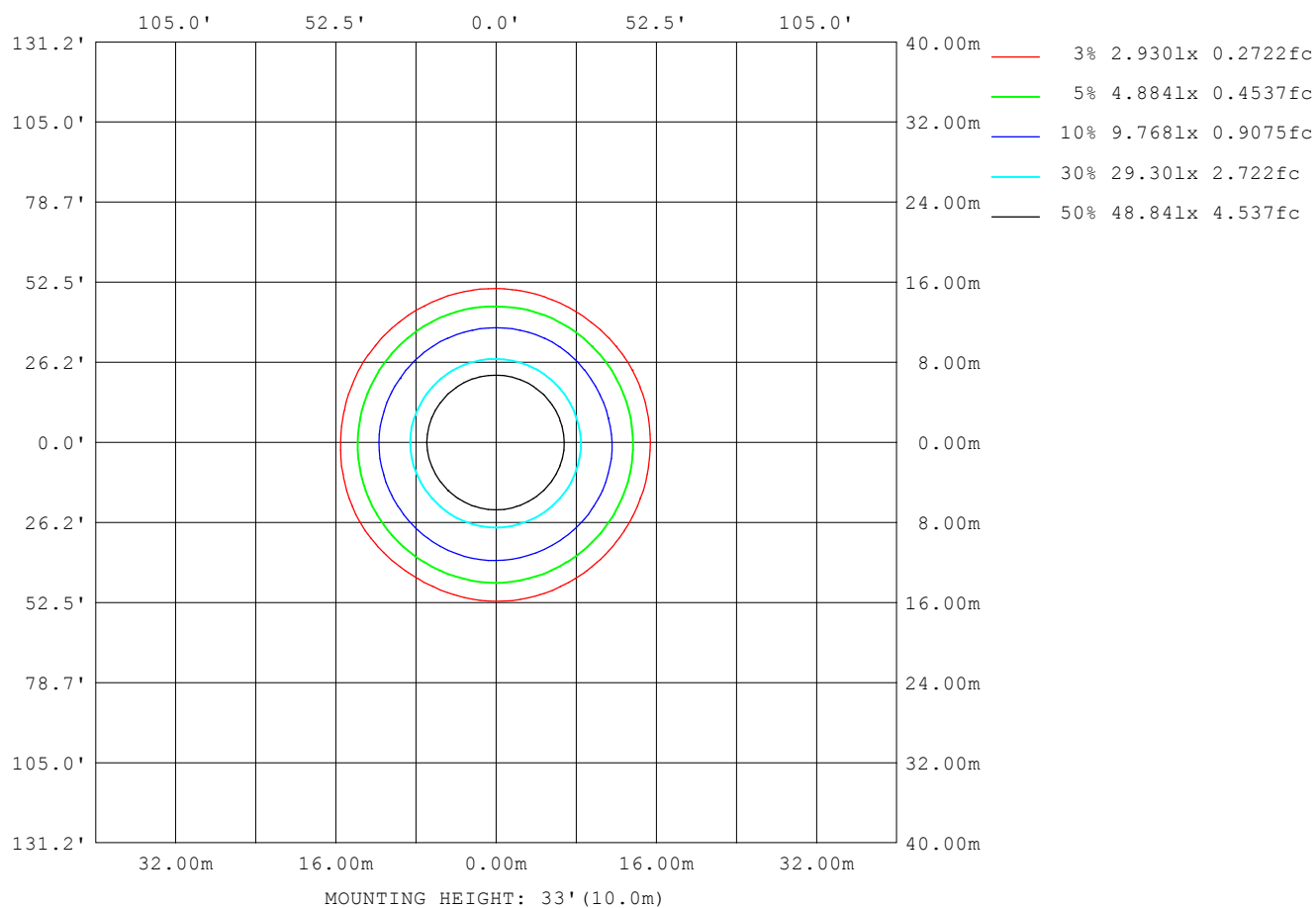
$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 0.5DEG  
Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity: 65.0%  
Test Distance: 9.432m [K=1.0000]  
Remarks:

Checker: LI

Assessor:

# GONIOPHOTOMETERS SYSTEM TEST REPORT

## ISOLUX DIAGRAM



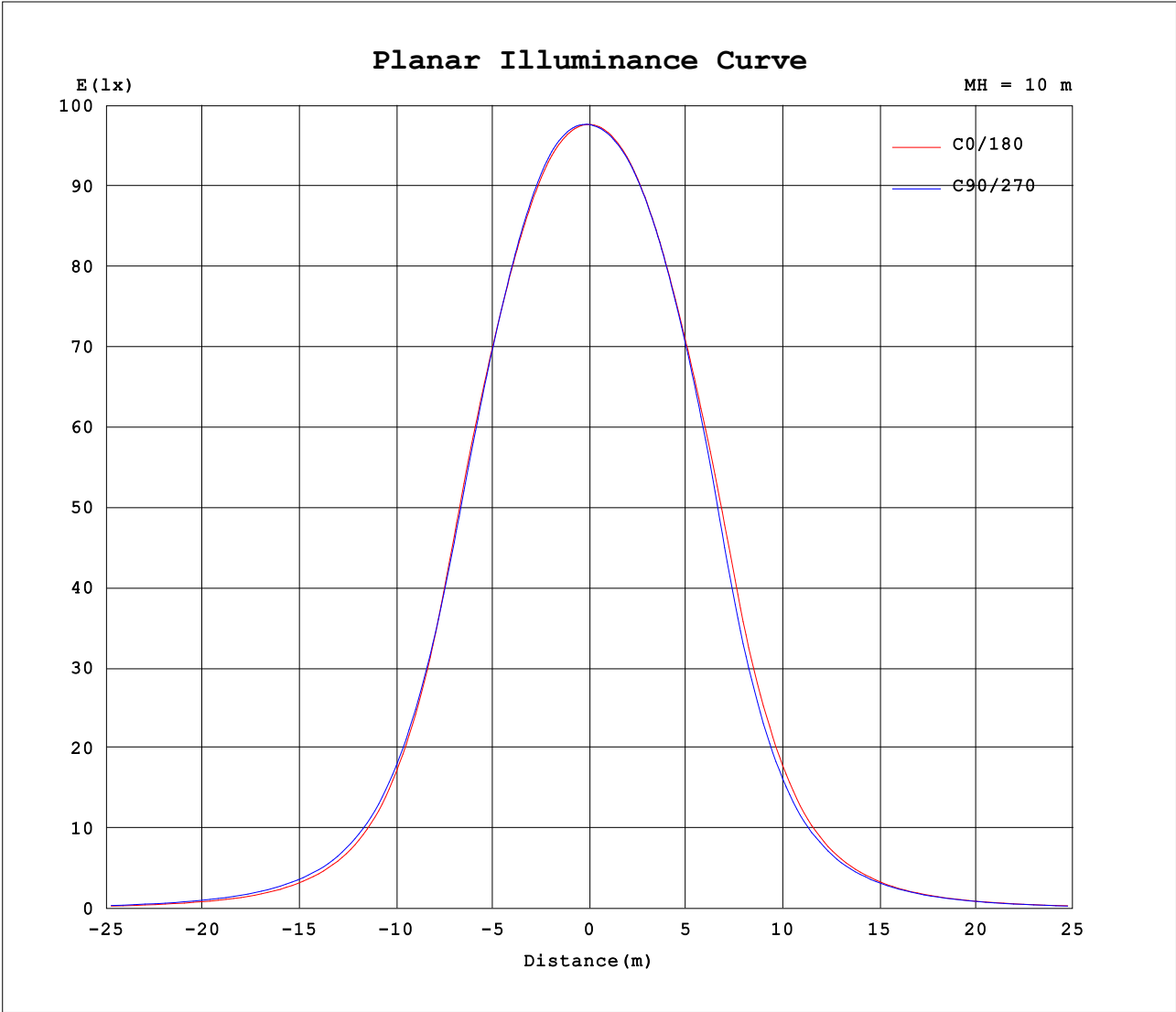
C Range: 0 - 360DEG  
C Interval: 2.5DEG  
Test Speed: HIGH  
Temperature: 25.3DEG  
Operators: WJH  
Test Date: 2019-12-27

Checker: LI

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 0.5DEG  
Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity: 65.0%  
Test Distance: 9.432m [K=1.0000]  
Remarks:

Assessor:

Planar Illuminance Curve



C Range: 0 - 360DEG  
C Interval: 2.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:WJH  
Test Date:2019-12-27

Checker: LI

γ Range: 0 - 90DEG  
γ Interval: 0.5DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:9.432m [K=1.0000]  
Remarks:

Assessor: