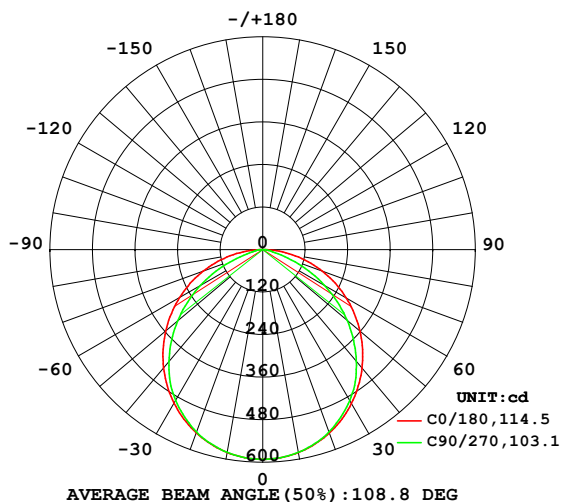


**LUMINAIRE PHOTOMETRIC TEST REPORT**

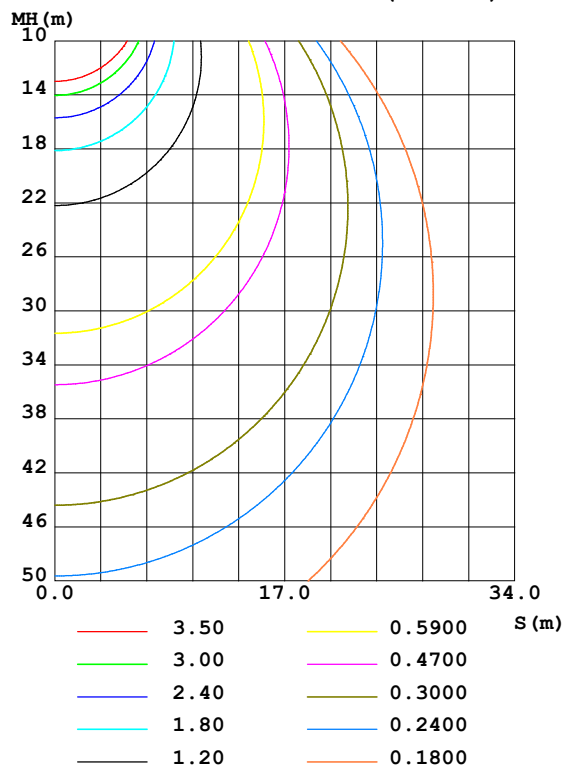
Test:U:240.0V I:0.0918A P:20.05W PF:0.9095 Lamp Flux:1580.78x1 lm		
NAME: GRAZER T1616_1020_NA_WHT_3000K CRI90	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:1
MFR.: DARKON	SUR.:	Shielding Angle:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 78.84 lm/W			
MODEL	T1616 3000K	I <sub>max</sub> (cd)	591.5	S/MH(C0/180)	1.26
NOMINAL POWER(W)		LOR(%)	100.0	S/MH(C90/270)	1.24
RATED VOLTAGE(V)	230.0	TOTAL FLUX(lm)	1580.8	η UP,DN(C0-180)	0.0,50.0
NOMINAL FLUX(lm)	1580.78	CIE CLASS	DIRECT	η UP,DN(C180-360)	0.0,50.0
LAMPS INSIDE	1	η up(%)	0.0	CIBSE SHR NOM	1.25
TEST VOLTAGE(V)	230	η down(%)	100.0	CIBSE SHR MAX	1.35

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

γ Range: 0 - 90DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [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	581.1	580.8	580.5	580.7	580.9	580.7	580.5	580.9	0- 10	55.95	55.95	3.54,3.54
20	550.4	549.1	547.2	549.0	549.9	548.7	547.3	549.2	10- 20	160.1	216.1	13.7,13.7
30	501.1	496.2	490.9	496.0	500.4	496.0	491.2	496.6	20- 30	241.8	457.9	29,29
40	435.9	425.9	411.0	425.7	435.2	425.9	412.2	426.6	30- 40	289.4	747.3	47.3,47.3
50	358.1	336.8	311.1	336.4	357.5	337.5	313.4	338.1	40- 50	294.6	1042	65.9,65.9
60	271.6	234.3	200.7	233.5	270.9	235.5	203.7	236.1	50- 60	256.5	1298	82.1,82.1
70	179.8	125.2	87.19	123.8	178.9	126.4	89.77	126.9	60- 70	181.4	1480	93.6,93.6
80	85.20	22.63	20.36	22.28	84.46	23.78	21.83	23.94	70- 80	84.04	1564	98.9,98.9
90	0.5722	0.4547	0.2970	0.4583	0.4732	0.4180	0.2640	0.3776	80- 90	16.94	1581	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:cd									UNIT:lm		

Conical surface Flux(90deg): 896.81 lm

%lum = 56.7%

%lamp = 56.7%

Conical surface Flux(120deg): 1298.4 lm

%lum = 82.1%

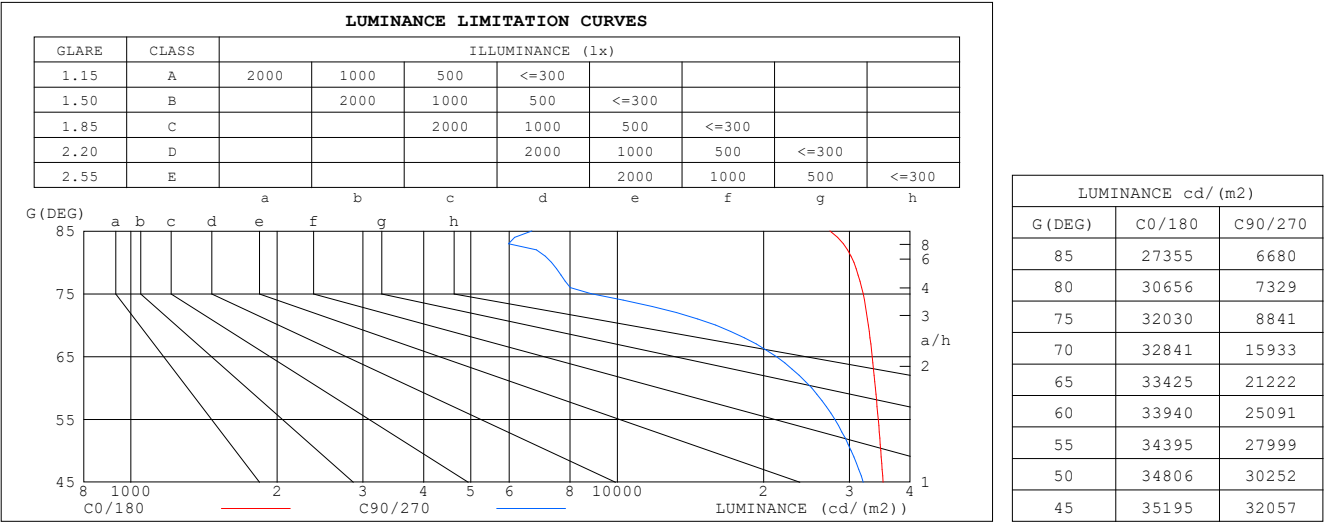
%lamp = 82.1%

C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [K=1.0000]  
Remarks:

LUMINANCE LIMITATION CURVES

Test:U:240.0V I:0.0918A P:20.05W PF:0.9095 Lamp Flux:1580.78x1 lm		
NAME: GRAZER T1616_1020_NA_WHT_3000K CRI90	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:1
MFR.: DARKON	SUR.:	Shielding Angle:



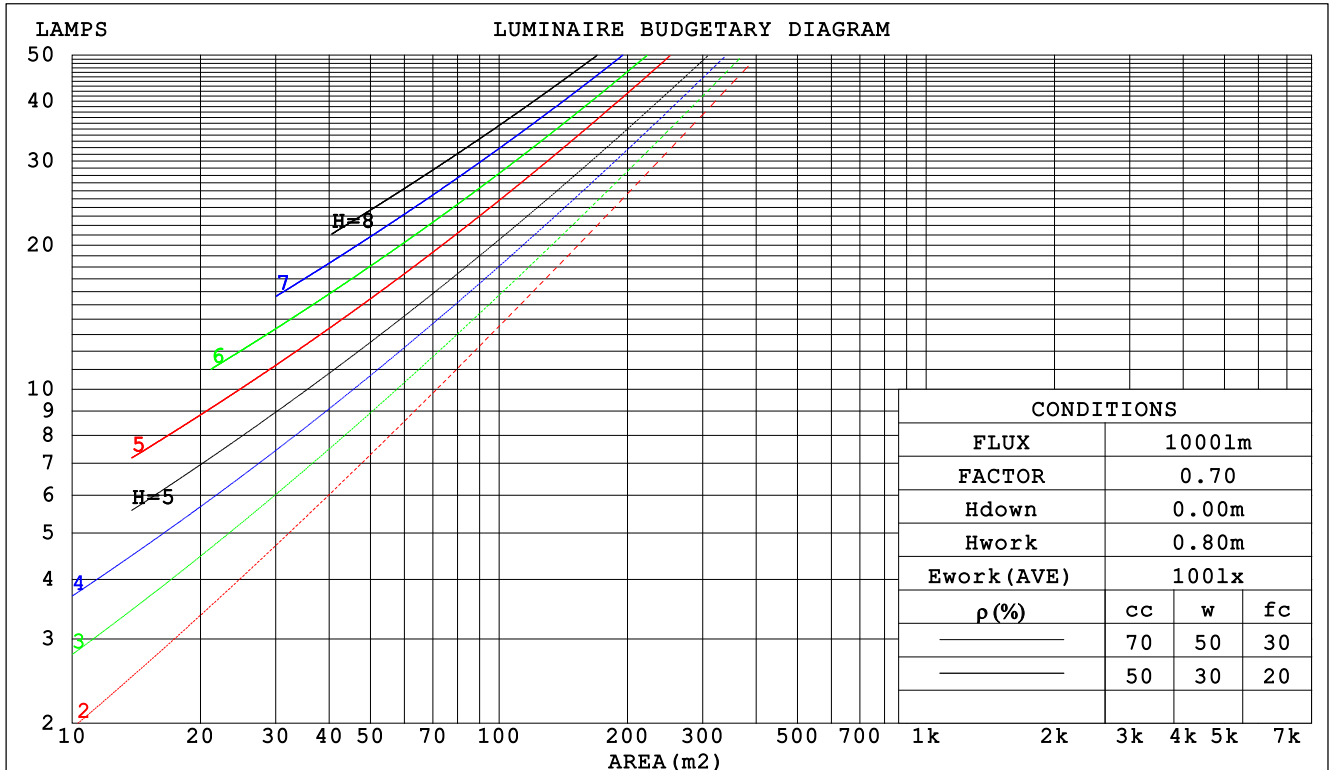
C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

γ Range: 0 - 90DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [K=1.0000]  
Remarks:

**CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM**

Test:U:240.0V I:0.0918A P:20.05W PF:0.9095 Lamp Flux:1580.78x1 lm		
NAME: GRAZER T1616_1020_NA_WHT_3000K CRI90	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:1
MFR.: DARKON	SUR.:	Shielding Angle:

$\rho_{cc}$	80%			70%			50%			30%			10%			0
$\rho_w$	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
$\rho_{fc}$	20%			20%			20%			20%			20%			0
RCR	Coefficients of Utilization(CU)															
	RCR:Room Cavity Ratio															
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	1.05	1.01	.97	1.03	.99	.96	.98	.95	.93	.95	.92	.90	.91	.89	.87	.85
2.0	.92	.85	.80	.90	.84	.79	.87	.81	.77	.83	.79	.75	.80	.77	.74	.72
3.0	.81	.73	.67	.79	.72	.66	.76	.70	.65	.74	.68	.64	.71	.67	.63	.61
4.0	.72	.63	.57	.71	.63	.56	.68	.61	.56	.66	.60	.55	.64	.58	.54	.52
5.0	.64	.56	.49	.63	.55	.49	.61	.54	.48	.59	.53	.48	.57	.52	.47	.45
6.0	.58	.49	.43	.57	.49	.43	.55	.48	.42	.54	.47	.42	.52	.46	.42	.40
7.0	.53	.44	.38	.52	.44	.38	.50	.43	.37	.49	.42	.37	.47	.41	.37	.35
8.0	.48	.40	.34	.47	.39	.34	.46	.39	.34	.45	.38	.33	.44	.38	.33	.31
9.0	.44	.36	.30	.43	.36	.30	.42	.35	.30	.41	.35	.30	.40	.34	.30	.28
10.0	.41	.33	.28	.40	.33	.28	.39	.32	.27	.38	.32	.27	.37	.31	.27	.25



C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [K=1.0000]  
Remarks:

**WEC AND CCEC**

Test:U:240.0V I:0.0918A P:20.05W PF:0.9095 Lamp Flux:1580.78x1 lm		
NAME: GRAZER T1616_1020_NA_WHT_3000K CRI90	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:1
MFR.: DARKON	SUR.:	Shielding 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	.290	.165	.052	.283	.161	.051	.270	.155	.049	.258	.149	.048	.247	.143	.046		
2.0	.278	.152	.047	.272	.150	.046	.260	.145	.045	.249	.140	.044	.239	.135	.043		
3.0	.260	.138	.041	.254	.136	.041	.244	.132	.040	.234	.128	.039	.226	.125	.039		
4.0	.241	.125	.037	.237	.124	.037	.227	.121	.036	.219	.118	.035	.211	.115	.035		
5.0	.224	.114	.033	.220	.113	.033	.212	.110	.032	.204	.108	.032	.197	.106	.032		
6.0	.209	.105	.030	.205	.104	.030	.198	.101	.029	.191	.099	.029	.185	.097	.029		
7.0	.195	.096	.027	.192	.095	.027	.185	.094	.027	.179	.092	.027	.174	.090	.026		
8.0	.182	.089	.025	.179	.088	.025	.174	.087	.025	.168	.085	.025	.163	.084	.024		
9.0	.171	.083	.023	.169	.082	.023	.163	.081	.023	.159	.080	.023	.154	.078	.023		
10.0	.161	.077	.021	.159	.077	.021	.154	.076	.021	.150	.074	.021	.146	.073	.021		

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	.179	.156	.136	.153	.134	.117	.105	.092	.081	.060	.053	.047	.019	.017	.015	
2.0	.170	.132	.100	.146	.114	.086	.100	.079	.060	.058	.046	.035	.018	.015	.011	
3.0	.162	.114	.076	.139	.099	.066	.096	.068	.046	.055	.040	.027	.018	.013	.009	
4.0	.155	.101	.059	.133	.087	.052	.091	.061	.036	.053	.036	.022	.017	.012	.007	
5.0	.148	.090	.048	.127	.078	.042	.087	.055	.030	.051	.032	.018	.016	.010	.006	
6.0	.141	.082	.040	.121	.071	.035	.083	.050	.025	.048	.029	.015	.016	.010	.005	
7.0	.134	.075	.034	.115	.065	.029	.080	.046	.021	.046	.027	.012	.015	.009	.004	
8.0	.128	.069	.029	.110	.060	.025	.076	.042	.018	.044	.025	.011	.014	.008	.004	
9.0	.122	.064	.026	.105	.056	.022	.073	.039	.016	.042	.023	.009	.014	.008	.003	
10.0	.116	.060	.023	.100	.052	.020	.069	.037	.014	.041	.022	.008	.013	.007	.003	

C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

γ Range: 0 - 90DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [K=1.0000]  
Remarks:

**UGR(Unified Glare Rating) Table**

Test:U:240.0V I:0.0918A P:20.05W PF:0.9095 Lamp Flux:1580.78x1 lm										
NAME: GRAZER T1616_1020_NA_WHT_3000K CRI90					TYPE:LED			WEIGHT:		
SPEC.:					DIM.:			SERIAL No.:1		
MFR.: DARKON					SUR.:			Shielding 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	25.4	26.9	25.6	27.1	27.3	24.2	25.7	24.5	25.9	26.1
3H	27.0	28.4	27.3	28.6	28.8	25.0	26.4	25.3	26.6	26.9
4H	27.7	29.0	28.0	29.3	29.5	25.1	26.4	25.4	26.7	26.9
6H	28.2	29.5	28.6	29.7	30.0	25.1	26.4	25.5	26.6	26.9
8H	28.4	29.6	28.8	29.9	30.2	25.1	26.3	25.5	26.6	26.9
12H	28.5	29.7	28.9	30.0	30.3	25.1	26.2	25.4	26.5	26.8
4H 2H	25.8	27.1	26.1	27.3	27.6	24.9	26.2	25.2	26.4	26.7
3H	27.6	28.7	27.9	29.0	29.3	25.8	26.9	26.2	27.2	27.5
4H	28.4	29.4	28.8	29.7	30.1	26.0	27.0	26.3	27.3	27.6
6H	29.0	29.9	29.4	30.3	30.7	26.0	26.9	26.4	27.3	27.6
8H	29.3	30.1	29.7	30.5	30.8	26.0	26.8	26.4	27.2	27.6
12H	29.4	30.2	29.8	30.6	31.0	26.0	26.8	26.4	27.1	27.5
8H 4H	28.4	29.3	28.8	29.6	30.0	26.2	27.0	26.6	27.4	27.8
6H	29.1	29.8	29.6	30.2	30.7	26.2	26.9	26.7	27.4	27.8
8H	29.4	30.0	29.9	30.4	30.9	26.3	26.9	26.7	27.3	27.8
12H	29.6	30.1	30.1	30.6	31.0	26.3	26.8	26.8	27.3	27.7
12H 4H	28.4	29.2	28.8	29.5	30.0	26.2	26.9	26.6	27.3	27.7
6H	29.1	29.7	29.6	30.2	30.6	26.3	26.9	26.7	27.3	27.8
8H	29.4	29.9	29.9	30.4	30.8	26.3	26.8	26.8	27.3	27.8
Variations with the observer position at spacings:										
S = 1.0H	+ 0.2 / - 0.2					+ 0.3 / - 0.4				
1.5H	+ 0.2 / - 0.3					+ 0.3 / - 0.5				
2.0H	+ 0.2 / - 0.3					+ 0.5 / - 0.6				

CIE Pub.117 Corrected 1581 lm Total Lamp Luminous Flux. (8log(F/F0) = 1.6)

C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

γ Range: 0 - 90DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [K=1.0000]  
Remarks:

**UTILIZATION FACTORS TABLE**

Test:U:240.0V I:0.0918A P:20.05W PF:0.9095 Lamp Flux:1580.78x1 lm		
NAME: GRAZER T1616_1020_NA_WHT_3000K CRI90	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:1
MFR.: DARKON	SUR.:	Shielding Angle:

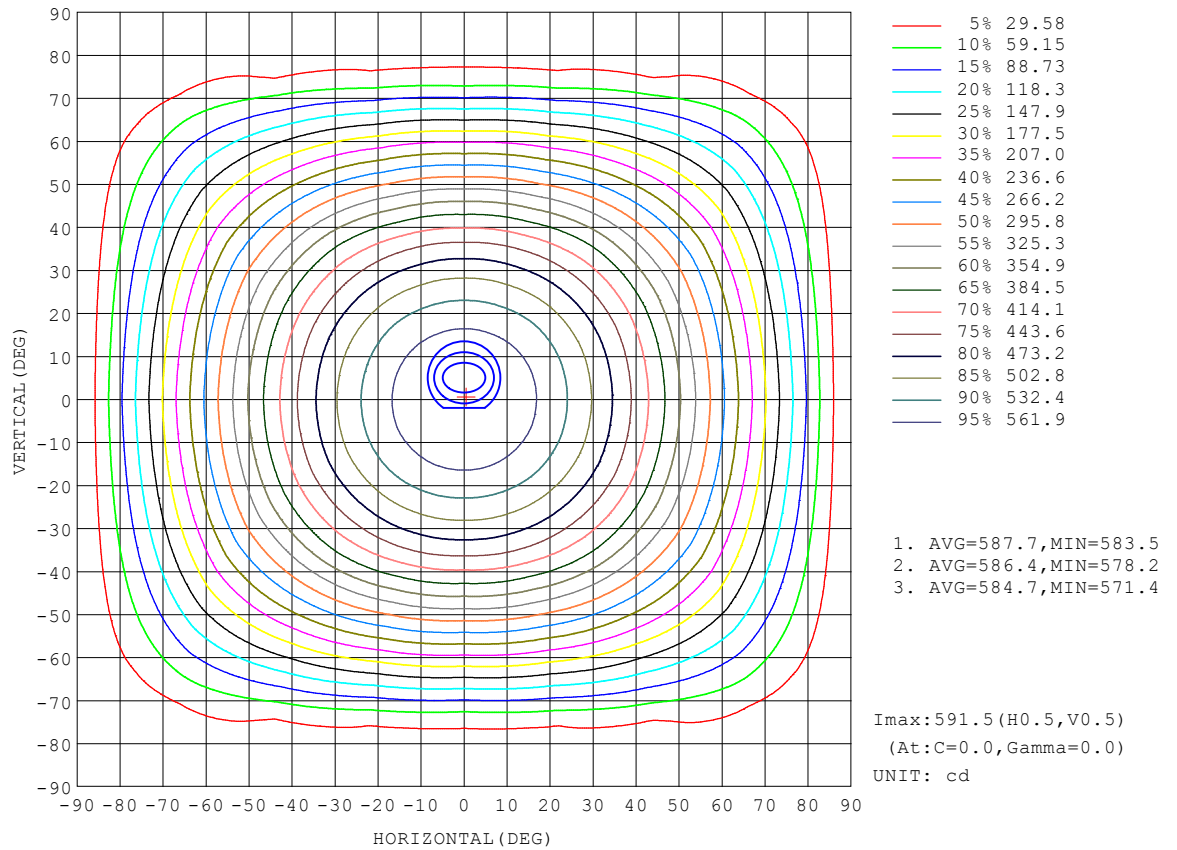
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS (PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	59	47	41	58	47	41	57	47	40	34
0.80	69	58	51	68	57	50	66	57	50	43
1.00	78	67	60	76	66	60	74	68	59	52
1.25	85	75	68	83	74	67	81	73	67	60
1.50	90	80	74	88	79	73	85	78	72	65
2.00	96	88	82	95	87	81	91	85	80	72
2.50	100	93	87	98	91	86	94	89	84	76
3.00	103	97	92	101	95	91	97	92	88	80
4.00	107	102	97	105	100	96	101	97	93	85
5.00	109	105	101	107	103	100	103	99	96	87
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		

C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [K=1.0000]  
Remarks:

**ISOCANDELA DIAGRAM**

Test:U:240.0V I:0.0918A P:20.05W PF:0.9095 Lamp Flux:1580.78x1 lm		
NAME: GRAZER T1616_1020_NA_WHT_3000K CRI90	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:1
MFR.: DARKON	SUR.:	Shielding Angle:



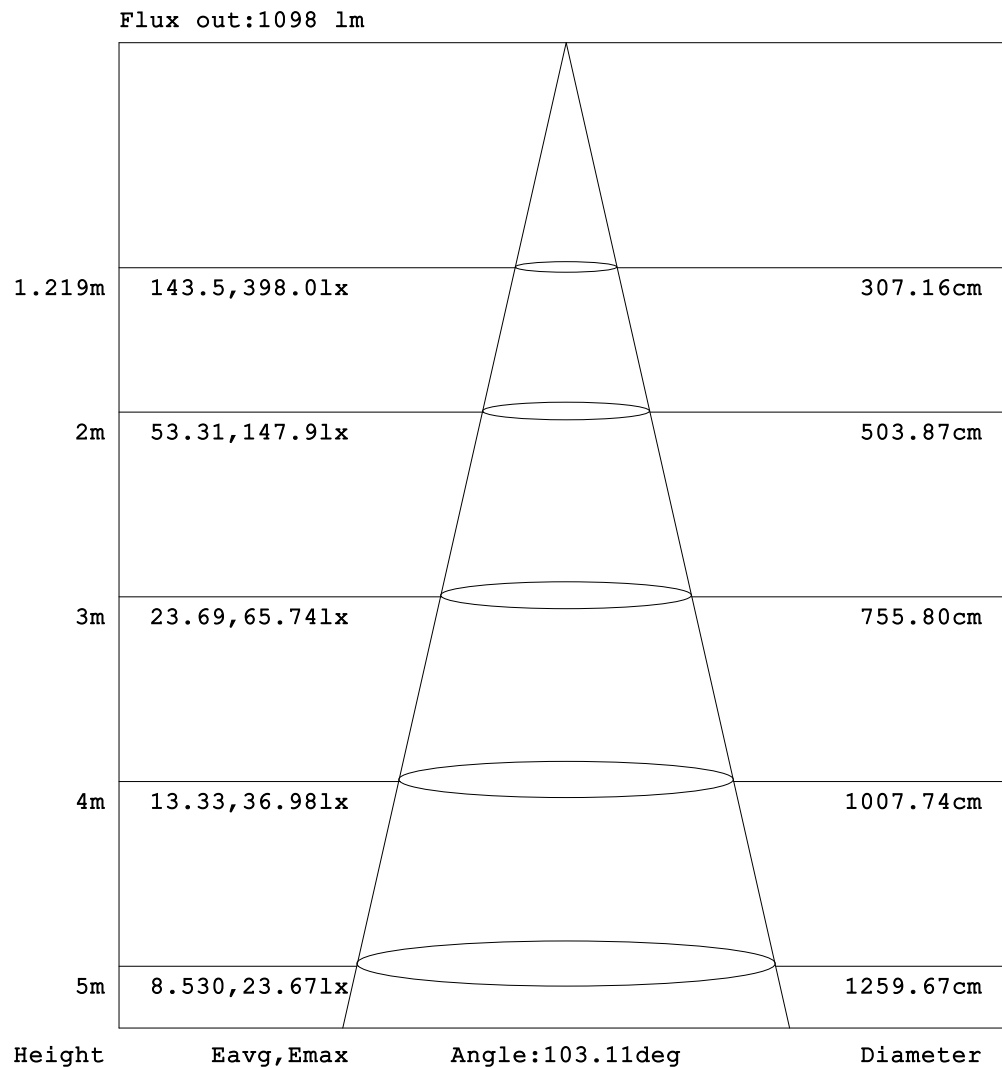
C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [K=1.0000]  
Remarks:



**AAI Figure**

Test:U:240.0V I:0.0918A P:20.05W PF:0.9095 Lamp Flux:1580.78x1 lm		
NAME: GRAZER T1616_1020_NA_WHT_3000K CRI90	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:1
MFR.: DARKON	SUR.:	Shielding Angle:



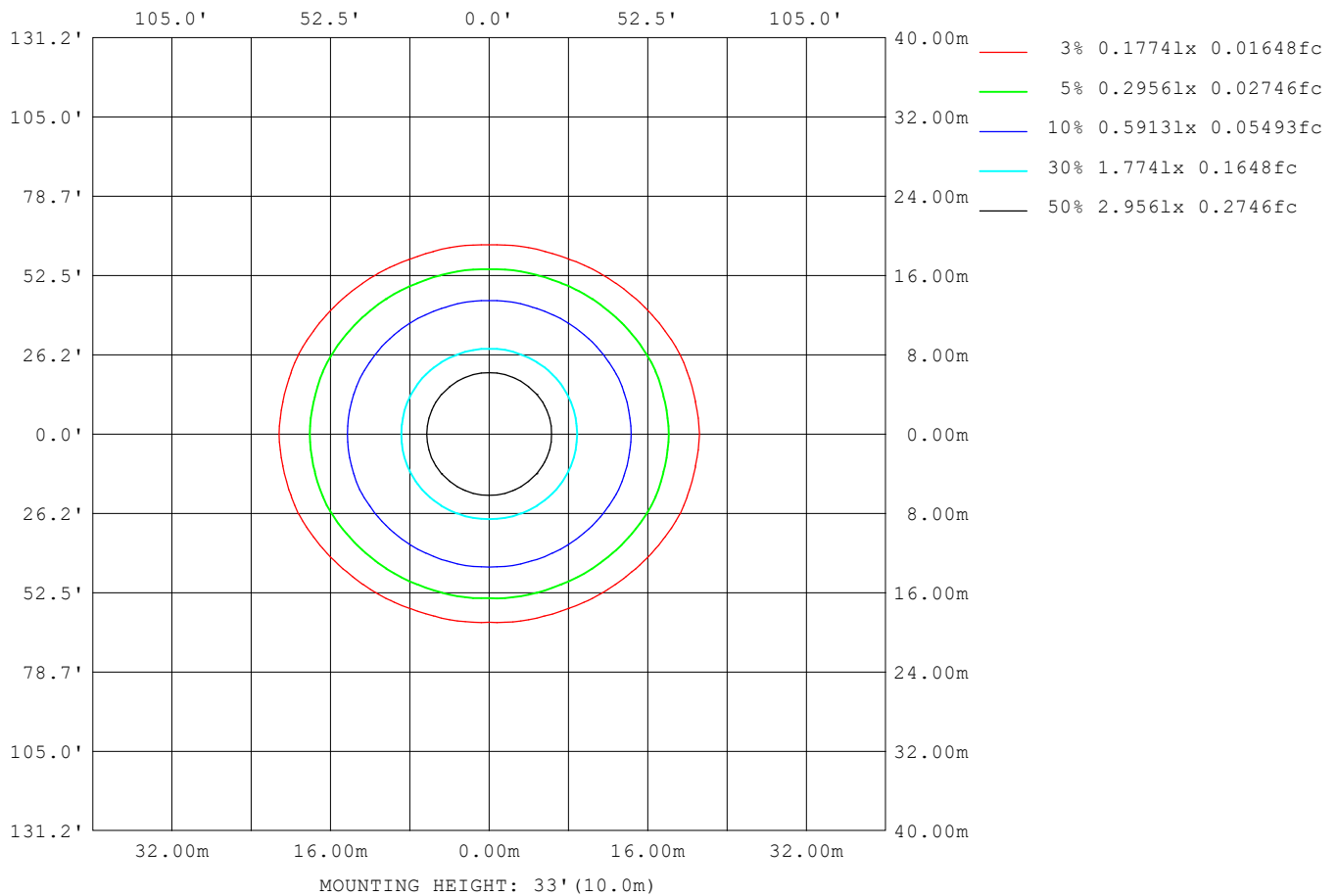
**Note:**The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

γ Range: 0 - 90DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [K=1.0000]  
Remarks:

**ISOLUX DIAGRAM**

Test:U:240.0V I:0.0918A P:20.05W PF:0.9095 Lamp Flux:1580.78x1 lm		
NAME: GRAZER T1616_1020_NA_WHT_3000K CRI90	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:1
MFR.: DARKON	SUR.:	Shielding Angle:



C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

γ Range: 0 - 90DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [K=1.0000]  
Remarks:

### LED Avg.L Report

Test:U:240.0V I:0.0918A P:20.05W PF:0.9095 Lamp Flux:1580.78x1 lm		
NAME: GRAZER T1616_1020_NA_WHT_3000K CRI90	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:1
MFR.: DARKON	SUR.:	Shielding Angle:

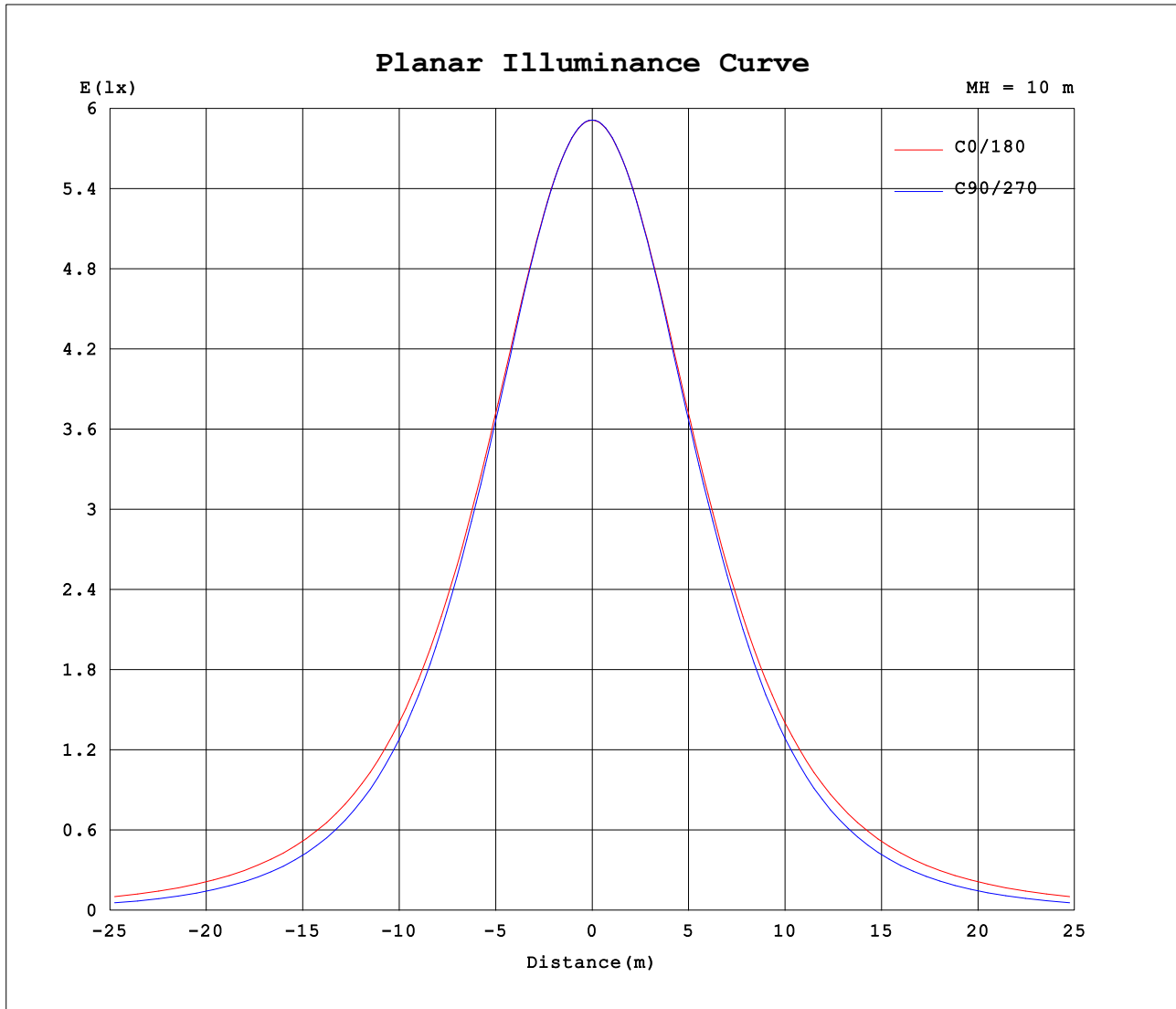
AvgL	cd/m2
L_0~180 (65) av	33433
L_0~180 (75) av	31941
L_0~180 (85) av	27022
L_90~270 (65) av	21444
L_90~270 (75) av	9045
L_90~270 (85) av	6901
L_45 (65) av	26728
L_45 (75) av	16944
L_45 (85) av	6376

Standard: GB/T 29293-2012

C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.3DEG  
Operators:JEFF  
Test Date:31 March 2025

γ Range: 0 - 90DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity:65.0%  
Test Distance:7.891m [K=1.0000]  
Remarks:

### Planar Illuminance Curve



C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature: 25.3DEG  
Operators: JEFF  
Test Date: 31 March 2025

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity: 65.0%  
Test Distance: 7.891m [K=1.0000]  
Remarks:

```

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.295
Humidity:65.0%
Test Distance:7.891m [K=1.0000]
Remarks:

```