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Photometric Report

Job / Report / Date	42 / 10692 / 10692-3a / 2013.06.17
Customer	Encapsulite International Ltd.
Luminaire Range	MT50 IP68
Luminaire catalog No.	MT50 21W
Luminaire description	linear cylindrical luminaire with clear cover data derived from range test series
Lamp description	21W/840 HE Osram Lumilux
Lamp lumen output	1,900 lm
Lamp quantity	1

Photometric Report

- Pictures
- Luminaire information
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- Principal Axes Intensities
- Light Output Ratios & CIBSE TM5 Results
- Aspect Factors
- Luminous intensities
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- VDI Luminance table
- CIBSE TM10 Glare Index Results
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Job / Report / Date

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Customer

Encapsulite International Ltd.

Luminaire Range

MT50 IP68

Luminaire catalog No.

MT50 21W

Luminaire description

linear cylindrical luminaire
with clear cover

data derived from range test series

Lamp description

21W/840 HE Osram Lumilux

Lamp lumen output

1,900 lm

Lamp quantity

1



Helvar
www.helvar.com

ELECTRONIC BALLAST EL1x14-35s
220-240V 0/50-60Hz



T5:14W 0.08-0.06A λ 0.96

T5:21,28,35W 0.18-0.09A λ 0.98

ta = -20...+50°C

75



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Luminaire physical characteristics

Overall Dimensions

Length	960mm
Width	50mm
Height	50mm

Visible Dimensions when installed

Length	960mm
Width	50mm
Height	50mm

Luminous Dimensions

Length	880mm
Width	50mm
Height 0°	25mm
Height 90°	0mm
Height 180°	25mm
Height 270°	0mm

Luminous Areas

Base	0.044m ²
Sides	0.022m ² (0°/180° azimuth)
Ends	0m ² (90°/270° azimuth)

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Report Basis

All measurements taken in accordance with EN13032.

Lamp tests were performed with the lamps in a horizontal orientation.

Luminaire tests were performed with the lamps in a horizontal orientation.

The photometric centre of the luminaire was taken as the geometric centre of the lamp.

The photometric nadir was taken to be perpendicular to the front face of the reflector.

The luminaire has been treated as though it has 2 planes of symmetry through the 0°/180° plane and the 90°/270° plane.

The lumen output, light output ratio (LORL) and power consumption of the luminaire were determined at 25°C after 100 hours pre-conditioning.

Lamps used for test were provided by the customer.

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Electrical input & Photometric output characteristics

Control gear

1 * Helvar EL1x14-35S

Ballast Voltage Range 220-240V
Ballast Current Range .09-.18A
Ballast Power Factor 0.98

Sample	Voltage (V)	Current (mA)	Power Factor	Power (W)	VA	Output (lm)	% of Nominal	Efficacy (lm/W)
Luminaire	230.0	101.4	0.960	22.4	23.3	1,529	80%	68.3
Lamp	230.0	101.5	0.961	22.4	23.3	1,539	81%	68.7

Electrical characteristics at 25°C

Ballast Nominal	230V	93.9mA	0.98PF	21.2W	21.6VA
Lamp Nominal	230V	91.3mA	1.00PF	21.0W	21.0VA
Luminaire	230V	101.4mA	0.96PF	22.4W	23.3VA
Lamp	230V	101.5mA	0.96PF	22.4W	23.3VA

Measured Electrical characteristics relative to Ballast Nominal

Luminaire	Current	108%	Power	106%	VA	108%
Lamp	Current	108%	Power	106%	VA	108%

Measured Electrical characteristics relative to Lamp Nominal

Luminaire	Current	111%	Power	107%	VA	111%
Lamp	Current	111%	Power	107%	VA	111%

Lumen Output figures used in this report (lumens)

Nominal Lamp Output	1,900
Measured Luminaire Output	1,529
Measured Lamp Output	1,539

Measured Lumen Output characteristics relative to Lamp Nominal Total

Luminaire	80%
Lamp	81%

Measured luminous efficacy at 25°C

Luminaire	68.3 lm/W
Lamp	68.7 lm/W

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The light output ratio of the luminaire was measured as 0.993 at 25°C.
This is the ratio of the output of the luminaire to the output of the lamp.

The measured lumen output of the luminaire was 1,529 lumens at 25°C.
This figure can be related to the nominal lumen output of the lamp quoted by the manufacturer of 1,900 lumens, to give a nominal light output ratio of 0.805.

The measured lumen output of the lamp was 1,539 lumens at 25°C.
This figure can be related to the nominal lumen output of the lamp quoted by the manufacturer of 1,900 lumens, to give a nominal BLF of 0.81.

For lighting design calculations:

A light output ratio of 1 should be used in conjunction with the measured lumen output of the luminaire of 1,529 lumens.

or

The nominal light output ratio of 0.805 should be used in conjunction with the nominal lumen output of the lamp of 1,900 lumens.

or

The measured light output ratio of 0.993 should be used in conjunction with the measured lumen output of the lamp of 1,539 lumens.

or

The measured light output ratio of 0.993 should be used in conjunction with the nominal lumen output of the lamp of 1,900 lumens and the nominal BLF of 0.81.

This report is based on the following parameters:

The Light Output Ratio is the nominal value of 0.805.

The lamp output is the nominal value of 1,900 lumens.

There is 1 lamp in the luminaire.

No measurements relating to the ballast factor of the control gear were made.

The nominal ballast factor represented by the ratio of the measured lumen output of the lamp to the declared lumen output has been incorporated into the nominal Light Output Ratio figure. The resultant nominal LOR allows lighting calculations to be performed using the declared lamp output without having to incorporate a separate BLF calculation to allow for deviation from the nominal output due to thermal and gear effects.

If the measured LOR figure is used, the measured lumen output of the lamp should be used to perform lighting calculations. If the nominal lamp output is used with the measured LOR figure, an allowance should be made for any deviation of the lamp and gear combination from the published lumen output, represented by the nominal BLF.

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Lamp description

21W/840 HE Osram Lumilux

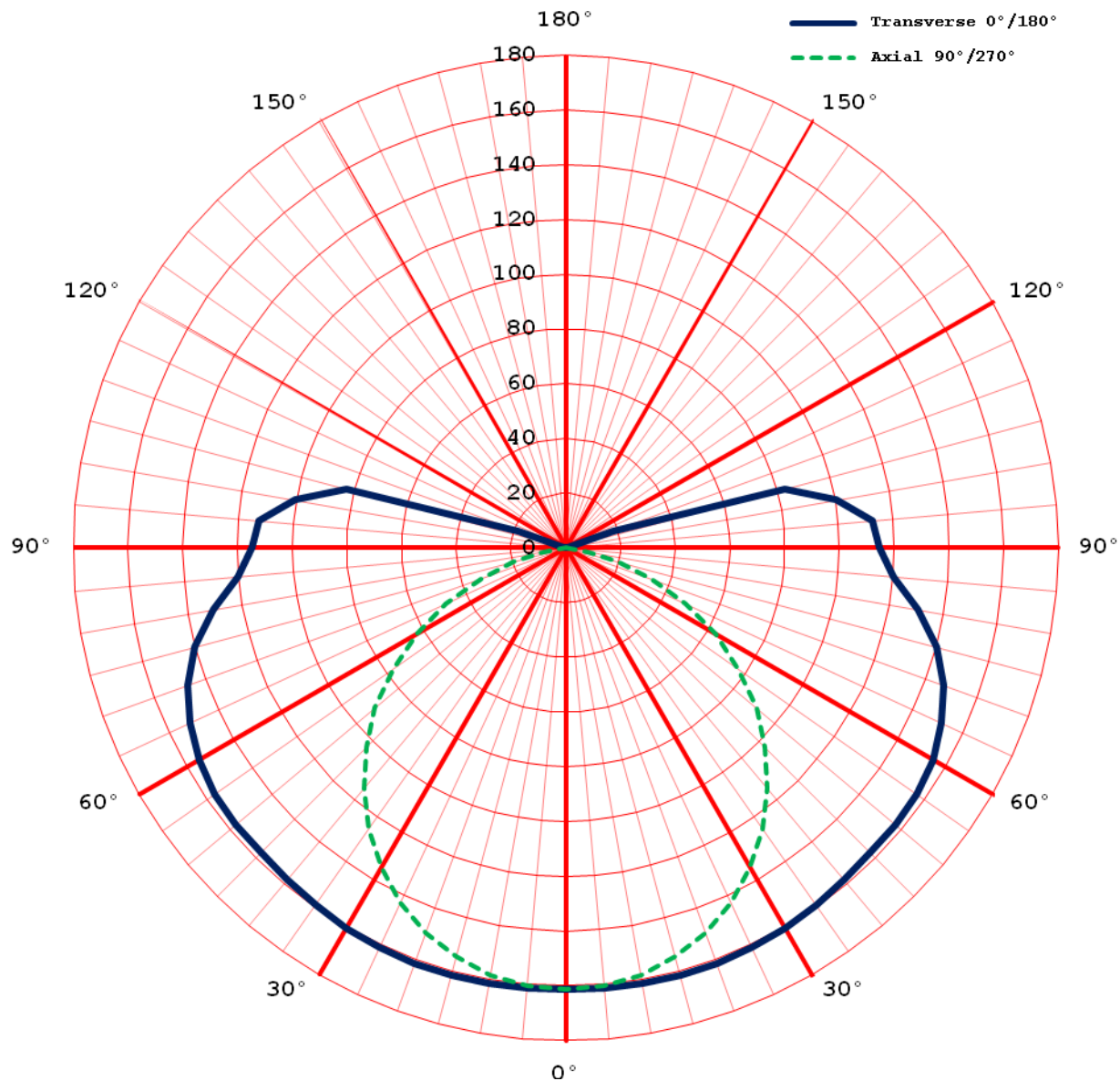
Lamp lumen output

1,900 lm

Lamp quantity

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Average Principal Axes Luminous Intensities (cd/klm)



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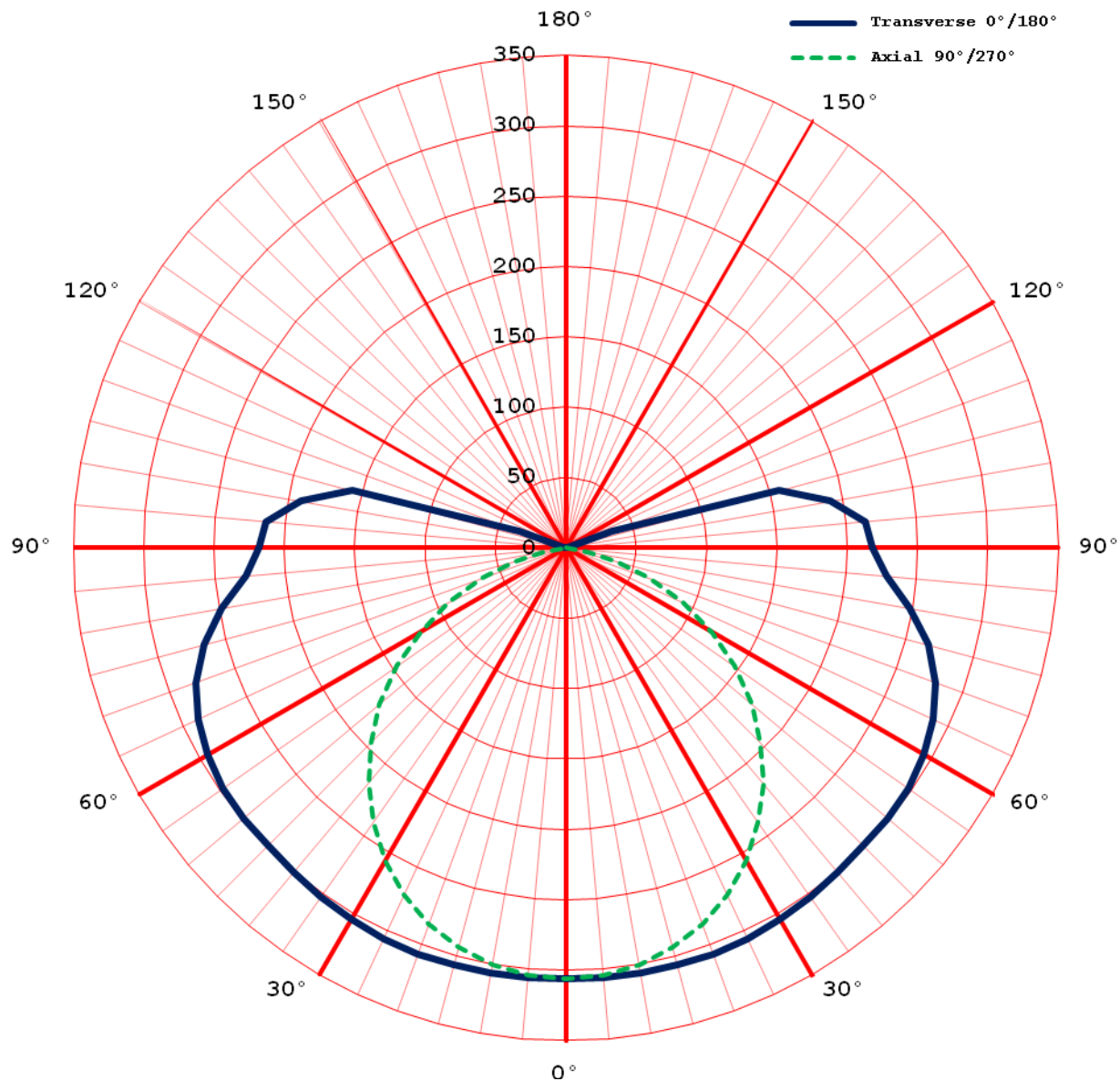
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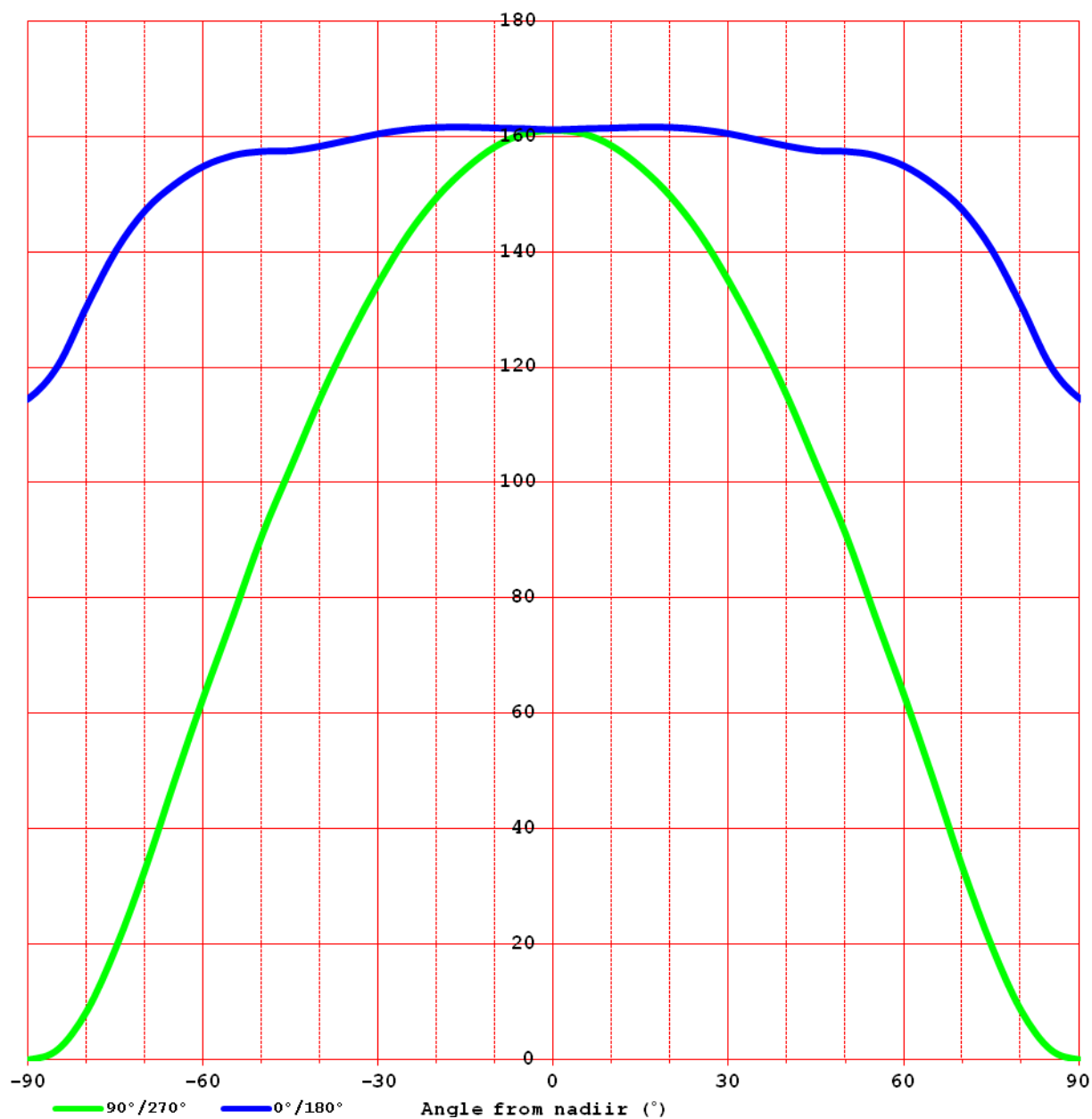
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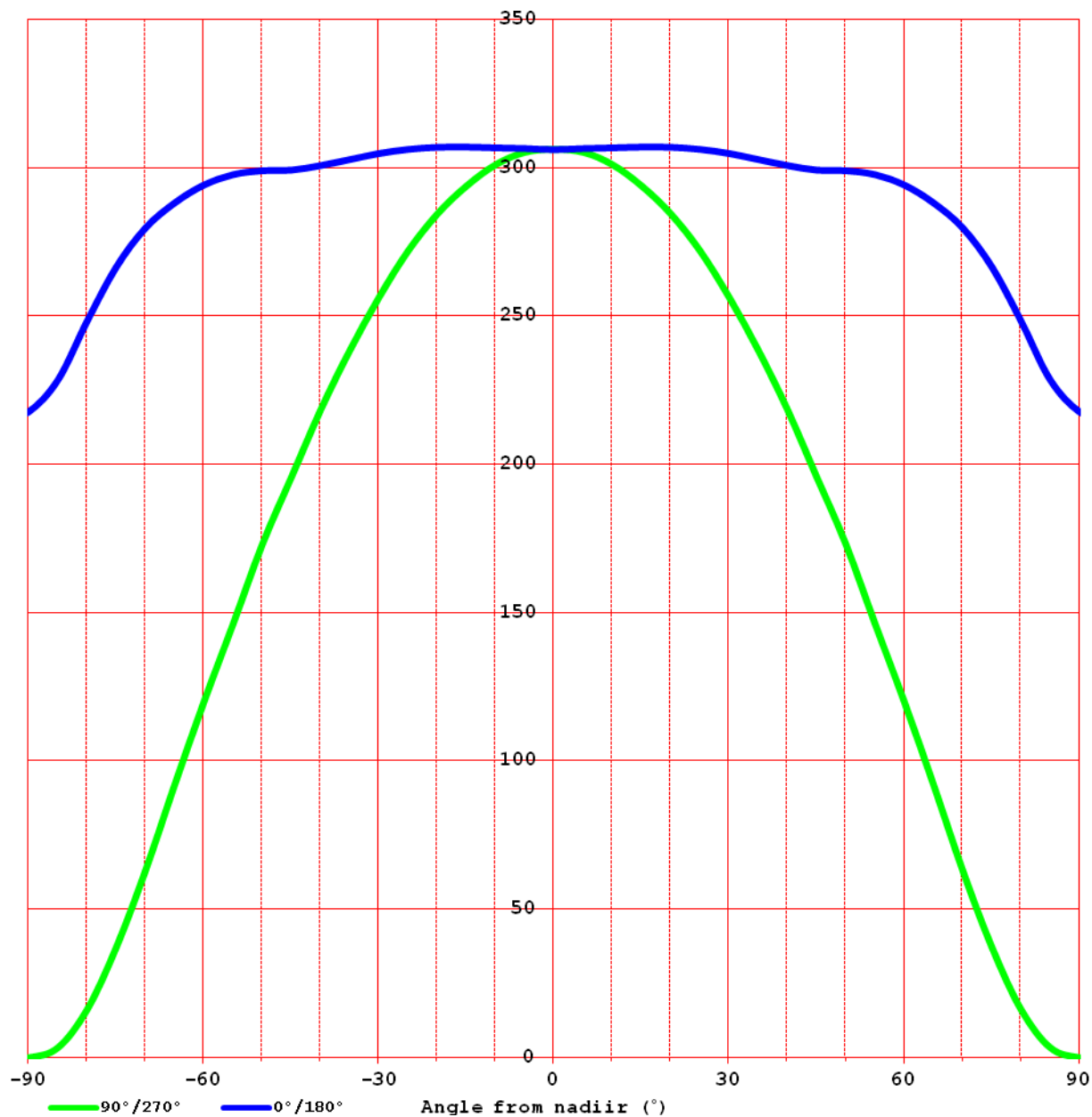
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Average Luminous Intensities (cd/Klm)

Angle	Transverse plane	Axial plane
0°	161.14	161.14
5°	161.32	160.58
10°	161.43	158.39
15°	161.58	154.62
20°	161.54	149.66
25°	161.17	143.10
30°	160.43	134.84
35°	159.37	125.44
40°	158.30	114.89
45°	157.49	102.96
50°	157.38	91.00
55°	156.68	76.90
60°	154.84	63.09
65°	151.67	48.42
70°	147.21	33.17
75°	140.29	19.58
80°	130.67	8.51
85°	120.25	1.78
90°	114.58	0.00
95°	112.66	0.00
100°	100.51	0.00
105°	82.76	0.00
110°	18.49	0.00
115°	0.70	0.00
120°	0.40	0.00
125°	0.00	0.00
130°	0.00	0.00
135°	0.00	0.00
140°	0.00	0.00
145°	0.00	0.00
150°	0.00	0.00
155°	0.00	0.00
160°	0.00	0.00
165°	0.00	0.00
170°	0.00	0.00
175°	0.00	0.00
180°	0.00	0.00

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Average Luminous Intensities (cd)

Angle	Transverse plane	Axial plane
0°	306.16	306.16
5°	306.51	305.10
10°	306.72	300.95
15°	307.00	293.77
20°	306.92	284.35
25°	306.22	271.89
30°	304.82	256.20
35°	302.79	238.34
40°	300.77	218.28
45°	299.23	195.63
50°	299.02	172.90
55°	297.69	146.10
60°	294.19	119.87
65°	288.17	92.00
70°	279.70	63.03
75°	266.55	37.20
80°	248.28	16.18
85°	228.48	3.37
90°	217.70	0.00
95°	214.06	0.00
100°	190.97	0.00
105°	157.24	0.00
110°	35.13	0.00
115°	1.33	0.00
120°	0.77	0.00
125°	0.00	0.00
130°	0.00	0.00
135°	0.00	0.00
140°	0.00	0.00
145°	0.00	0.00
150°	0.00	0.00
155°	0.00	0.00
160°	0.00	0.00
165°	0.00	0.00
170°	0.00	0.00
175°	0.00	0.00
180°	0.00	0.00

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Light Output Ratios Up 0.10
Down 0.70
Total 0.80

Spacing to Height Ratios SHR NOM 1.75
SHR MAX 1.83
SHR MAX TRANS 2.43

Utilisation Factors UF(F) Standard Presentation SHR NOM = 1.75

Room Reflectances			Room Index									
C	W	F	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	
.70	.50	.20	N/A	.46	.51	.55	.61	.65	.68	.72	.75	
	.30		N/A	.39	.45	.49	.55	.60	.63	.68	.71	
	.10		N/A	.34	.39	.44	.50	.55	.59	.64	.68	
.50	.50	.20	N/A	.43	.48	.52	.57	.61	.63	.67	.70	
	.30		N/A	.37	.42	.46	.52	.56	.59	.64	.67	
	.10		N/A	.33	.38	.42	.48	.52	.56	.60	.64	
.30	.50	.20	N/A	.40	.45	.48	.53	.57	.59	.63	.65	
	.30		N/A	.35	.40	.44	.49	.53	.56	.60	.62	
	.10		N/A	.31	.36	.40	.45	.49	.53	.57	.60	
.00	.00	.00	N/A	.28	.32	.36	.41	.44	.47	.51	.54	
BZ Class			N/A	6	6	6	6	6	6	6	6	

CIE Flux code 33 / 61 / 83 / 87 / 80

CIE Room Index 0.60 0.80 1.00 1.25 1.50 2.00 2.50 3.00 4.00 5.00 10.0 20.0
CIE DRR 0.21 0.28 0.34 0.41 0.46 0.54 0.60 0.65 0.70 0.74 0.81 0.85
CIE class 7 / 7 / 7 / 8 / 8 / 8 / 8 / 8 / 8 / 8 / 9 / -

Flux Fraction Ratio 0.14
DIN Class 0.80 B

Calculated in accordance with CIBSE Technical Memorandum No. 5 1980

In accordance with TM5, this UF table is valid for values of SHR from 0.5 below SHR NOM to 0.5 above SHR NOM. SHR MAX is a separate limitation.

Reflectances given in the UF table are the effective reflectances of the ceiling cavity, walls and floor cavity, and must be determined for the actual room in which the luminaire will be used.

UF(F), UF(W), and UF(C) for 0% reflectance of the room surfaces are equivalent to DF(F), DF(W) and DF(C) respectively.

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Lamp description

21W/840 HE Osram Lumilux

Lamp lumen output

1,900 lm

Lamp quantity

1

Angle

Aspect Factors

	Parallel plane	Perpendicular plane
0°	0.000	0.000
5°	0.087	0.004
10°	0.173	0.015
15°	0.255	0.033
20°	0.334	0.058
25°	0.407	0.089
30°	0.474	0.123
35°	0.533	0.161
40°	0.585	0.201
45°	0.628	0.241
50°	0.664	0.279
55°	0.692	0.315
60°	0.712	0.347
65°	0.726	0.374
70°	0.734	0.394
75°	0.739	0.408
80°	0.740	0.416
85°	0.741	0.418
90°	0.741	0.419

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Zonal Flux Calculations

Angles	Individual	Cumulative
0° - 5°	0.5%	0.5%
5° - 10°	1.4%	1.9%
10° - 15°	2.3%	4.2%
15° - 20°	3.2%	7.5%
20° - 25°	4.0%	11.5%
25° - 30°	4.7%	16.2%
30° - 35°	5.3%	21.5%
35° - 40°	5.8%	27.4%
40° - 45°	6.2%	33.6%
45° - 50°	6.5%	40.1%
50° - 55°	6.7%	46.7%
55° - 60°	6.7%	53.5%
60° - 65°	6.7%	60.1%
65° - 70°	6.5%	66.6%
70° - 75°	6.2%	72.8%
75° - 80°	5.7%	78.5%
80° - 85°	5.1%	83.5%
85° - 90°	4.6%	88.1%
90° - 95°	4.2%	92.3%
95° - 100°	3.6%	96.0%
100° - 105°	2.7%	98.7%
105° - 110°	1.2%	99.9%
110° - 115°	0.1%	100.0%
115° - 120°	0.0%	100.0%
120° - 125°	0.0%	100.0%
125° - 130°	0.0%	100.0%
130° - 135°	0.0%	100.0%
135° - 140°	0.0%	100.0%
140° - 145°	0.0%	100.0%
145° - 150°	0.0%	100.0%
150° - 155°	0.0%	100.0%
155° - 160°	0.0%	100.0%
160° - 165°	0.0%	100.0%
165° - 170°	0.0%	100.0%
170° - 175°	0.0%	100.0%
175° - 180°	0.0%	100.0%

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Averaged Luminance Values (cd/m²)

Elevation(°)	Azimuth(°)						
	0.0°	30.0°	60.0°	90.0°	120.0°	150.0°	180.0°
45°	6412	6220	5867	6288	5867	6220	6412
50°	6625	6351	5775	6113	5775	6351	6625
55°	6882	6562	5720	5789	5720	6562	6882
60°	7166	6829	5689	5449	5689	6829	7166
65°	7478	7097	5784	4948	5784	7097	7478
70°	7830	7403	5916	4188	5916	7403	7830
75°	8167	7728	6056	3266	6056	7728	8167
80°	8472	8055	6114	2117	6114	8055	8472
85°	8872	8343	6170	880	6170	8343	8872
	180.0°	210.0°	240.0°	270.0°	300.0°	330.0°	0.0°
45°	6412	6220	5867	6288	5867	6220	6412
50°	6625	6351	5775	6113	5775	6351	6625
55°	6882	6562	5720	5789	5720	6562	6882
60°	7166	6829	5689	5449	5689	6829	7166
65°	7478	7097	5784	4948	5784	7097	7478
70°	7830	7403	5916	4188	5916	7403	7830
75°	8167	7728	6056	3266	6056	7728	8167
80°	8472	8055	6114	2117	6114	8055	8472
85°	8872	8343	6170	880	6170	8343	8872

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Lamp lumen output

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Lamp quantity

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Non averaged Luminance Values (cd/m²)

Elevation(°)

Azimuth(°)

	0.0°	30.0°	60.0°	90.0°	120.0°	150.0°	180.0°
45°	6368	6222	5899	6341	5922	6275	6455
50°	6578	6349	5833	6204	5832	6410	6672
55°	6821	6551	5781	5860	5761	6627	6942
60°	7113	6823	5750	5508	5752	6892	7220
65°	7421	7090	5850	5064	5820	7181	7536
70°	7785	7410	5997	4277	5936	7480	7875
75°	8117	7739	6157	3539	6083	7795	8216
80°	8423	8127	6152	2179	6158	8102	8521
85°	8768	8526	6421	1022	6139	8385	8976
	180.0°	210.0°	240.0°	270.0°	300.0°	330.0°	0.0°
45°	6455	6237	5854	6234	5792	6145	6368
50°	6672	6358	5769	6023	5666	6287	6578
55°	6942	6582	5694	5718	5647	6488	6821
60°	7220	6837	5676	5389	5577	6762	7113
65°	7536	7117	5771	4831	5694	7002	7421
70°	7875	7413	5922	4099	5810	7310	7785
75°	8216	7748	6055	2994	5927	7629	8117
80°	8521	8072	6170	2055	5974	7920	8423
85°	8976	8376	6162	738	5957	8084	8768

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Averaged Luminance Values (cd/m²/klm)

Elevation(°)

Azimuth(°)

	0.0°	30.0°	60.0°	90.0°	120.0°	150.0°	180.0°
45°	3375	3273	3088	3309	3088	3273	3375
50°	3487	3343	3039	3218	3039	3343	3487
55°	3622	3454	3011	3047	3011	3454	3622
60°	3772	3594	2994	2868	2994	3594	3772
65°	3936	3735	3044	2604	3044	3735	3936
70°	4121	3897	3114	2204	3114	3897	4121
75°	4298	4067	3187	1719	3187	4067	4298
80°	4459	4240	3218	1114	3218	4240	4459
85°	4670	4391	3247	463	3247	4391	4670
	180.0°	210.0°	240.0°	270.0°	300.0°	330.0°	0.0°
45°	3375	3273	3088	3309	3088	3273	3375
50°	3487	3343	3039	3218	3039	3343	3487
55°	3622	3454	3011	3047	3011	3454	3622
60°	3772	3594	2994	2868	2994	3594	3772
65°	3936	3735	3044	2604	3044	3735	3936
70°	4121	3897	3114	2204	3114	3897	4121
75°	4298	4067	3187	1719	3187	4067	4298
80°	4459	4240	3218	1114	3218	4240	4459
85°	4670	4391	3247	463	3247	4391	4670

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Customer

Encapsulite International Ltd.

Luminaire Range

MT50 IP68

Luminaire catalog No.

MT50 21W

Luminaire description

linear cylindrical luminaire
with clear cover

data derived from range test series

Lamp description

21W/840 HE Osram Lumilux

Lamp lumen output

1,900 lm

Lamp quantity

1

Non averaged Luminance Values (cd/m²/klm)

Elevation(°)

Azimuth(°)

	0.0°	30.0°	60.0°	90.0°	120.0°	150.0°	180.0°
45°	3352	3275	3105	3338	3117	3302	3398
50°	3462	3341	3070	3265	3069	3374	3511
55°	3590	3448	3042	3084	3032	3488	3654
60°	3744	3591	3026	2899	3027	3628	3800
65°	3906	3732	3079	2665	3063	3779	3966
70°	4098	3900	3156	2251	3124	3937	4145
75°	4272	4073	3241	1862	3202	4103	4324
80°	4433	4277	3238	1147	3241	4264	4485
85°	4615	4487	3380	538	3231	4413	4724
	180.0°	210.0°	240.0°	270.0°	300.0°	330.0°	0.0°
45°	3398	3283	3081	3281	3049	3234	3352
50°	3511	3346	3036	3170	2982	3309	3462
55°	3654	3464	2997	3009	2972	3415	3590
60°	3800	3598	2987	2836	2935	3559	3744
65°	3966	3746	3037	2543	2997	3685	3906
70°	4145	3902	3117	2157	3058	3848	4098
75°	4324	4078	3187	1576	3120	4015	4272
80°	4485	4248	3247	1082	3144	4168	4433
85°	4724	4409	3243	388	3135	4255	4615

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Customer Encapsulite International Ltd.
Luminaire Range MT50 IP68
Luminaire catalog No. MT50 21W
Luminaire description linear cylindrical luminaire
with clear cover
data derived from range test series
Lamp description 21W/840 HE Osram Lumilux
Lamp lumen output 1,900 lm
Lamp quantity 1

Maximum Non averaged Luminance Values (cd/m²)

Elevation(°)

	Maximum	Azimuth Angle

45°	6455	180°
50°	6672	180°
55°	6942	180°
60°	7220	180°
65°	7536	180°
70°	7875	180°
75°	8216	180°
80°	8521	180°
85°	8976	180°

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Luminaire catalog No. MT50 21W
Luminaire description linear cylindrical luminaire
with clear cover
data derived from range test series
Lamp description 21W/840 HE Osram Lumilux
Lamp lumen output 1,900 lm
Lamp quantity 1

VDT Luminance Information

BS EN 12464 (2002) / CIBSE LG7 (2005) / CIBSE LG3 (2001)

Permitted Usage according to Screen Type and Luminance Limit Angle	Limiting luminance (cd/m ²)	Use permitted at Luminance Limit Angle(°)	
		55°	65°
Screen Type III (No screen treatment) used with some negative polarity software	200	NO	NO
Screen Type I and II (Good or moderate screen treatment) used with some negative polarity software	500	NO	NO
Screen Type III (No screen treatment) used with only positive polarity software	1000	NO	NO
Screen Type I and II (Good or moderate screen treatment) used with only positive polarity software	1500	NO	NO

VDT Luminance Information

BS EN 12464 (2011) / CIBSE LG7 (2012)

Permitted Usage according to Screen Type and Luminance Limit Angle	Limiting luminance (cd/m ²)	Use permitted at Luminance Limit Angle(°)	
		55°	65°
Medium luminance screen (L <= 200 cdm ²) Case B negative polarity and/or higher requirements	1000	-	NO
Medium luminance screen (L <= 200 cdm ²) Case A positive polarity and normal requirements	1500	-	NO
High luminance screen (L > 200 cd/m ²) Case B negative polarity and/or higher requirements	1500	-	NO
High luminance screen (L > 200 cd/m ²) Case A positive polarity and normal requirements	3000	-	NO

Customer Encapsulite International Ltd.
 Luminaire Range MT50 IP68
 Luminaire catalog No. MT50 21W
 Luminaire description linear cylindrical luminaire
 with clear cover
 data derived from range test series
 Lamp description 21W/840 HE Osram Lumilux
 Lamp lumen output 1,900 lm
 Lamp quantity 1

Uncorrected Glare Indices

Reflectance of										
Ceiling	.70	.70	.50	.50	.30	.70	.70	.50	.50	.30
Wall	.50	.30	.50	.30	.30	.50	.30	.50	.30	.30
Floor Cavity	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20

Room dimension		Viewed crosswise					Viewed endwise				
X Y		0°					90°				
2H	2H	16.0	17.9	16.7	18.6	19.4	12.4	14.4	13.1	15.0	15.8
	3H	19.5	21.3	20.2	22.0	22.7	14.4	16.2	15.1	16.9	17.7
	4H	21.2	22.9	21.9	23.6	24.4	15.0	16.7	15.8	17.4	18.3
	6H	23.0	24.5	23.7	25.3	26.1	15.5	17.1	16.2	17.8	18.6
	8H	23.8	25.3	24.5	26.1	26.9	15.6	17.1	16.3	17.8	18.7
	12H	24.7	26.2	25.4	26.9	27.8	15.6	17.1	16.3	17.8	18.7
4H	2H	17.0	18.7	17.7	19.4	20.2	14.7	16.3	15.4	17.1	17.9
	3H	20.8	22.3	21.5	23.0	23.9	17.0	18.5	17.7	19.2	20.1
	4H	22.8	24.1	23.5	24.9	25.8	18.0	19.3	18.7	20.1	21.0
	6H	24.7	26.0	25.5	26.8	27.6	18.6	19.8	19.4	20.6	21.5
	8H	25.7	26.9	26.5	27.7	28.6	18.8	20.0	19.6	20.8	21.7
	12H	26.8	27.9	27.6	28.7	29.6	19.0	20.1	19.8	20.9	21.8
8H	4H	23.5	24.6	24.3	25.4	26.3	20.1	21.3	20.9	22.1	23.0
	6H	25.7	26.7	26.5	27.5	28.5	21.2	22.2	22.0	23.0	23.9
	8H	27.0	27.9	27.9	28.8	29.7	21.7	22.5	22.5	23.4	24.3
	12H	28.3	29.1	29.2	30.0	30.9	22.0	22.7	22.8	23.6	24.6
12H	4H	23.6	24.7	24.4	25.5	26.4	21.1	22.1	21.9	22.9	23.9
	6H	26.0	26.9	26.9	27.8	28.7	22.4	23.3	23.2	24.1	25.0
	8H	27.4	28.2	28.2	29.0	30.0	23.0	23.7	23.8	24.6	25.5

Calculated in accordance with CIBSE Technical Memorandum No. 10 1985

Customer

Encapsulite International Ltd.

Luminaire Range

MT50 IP68

Luminaire catalog No.

MT50 21W

Luminaire description

linear cylindrical luminaire
with clear cover

data derived from range test series

Lamp description

21W/840 HE Osram Lumilux

Lamp lumen output

1,900 lm

Lamp quantity

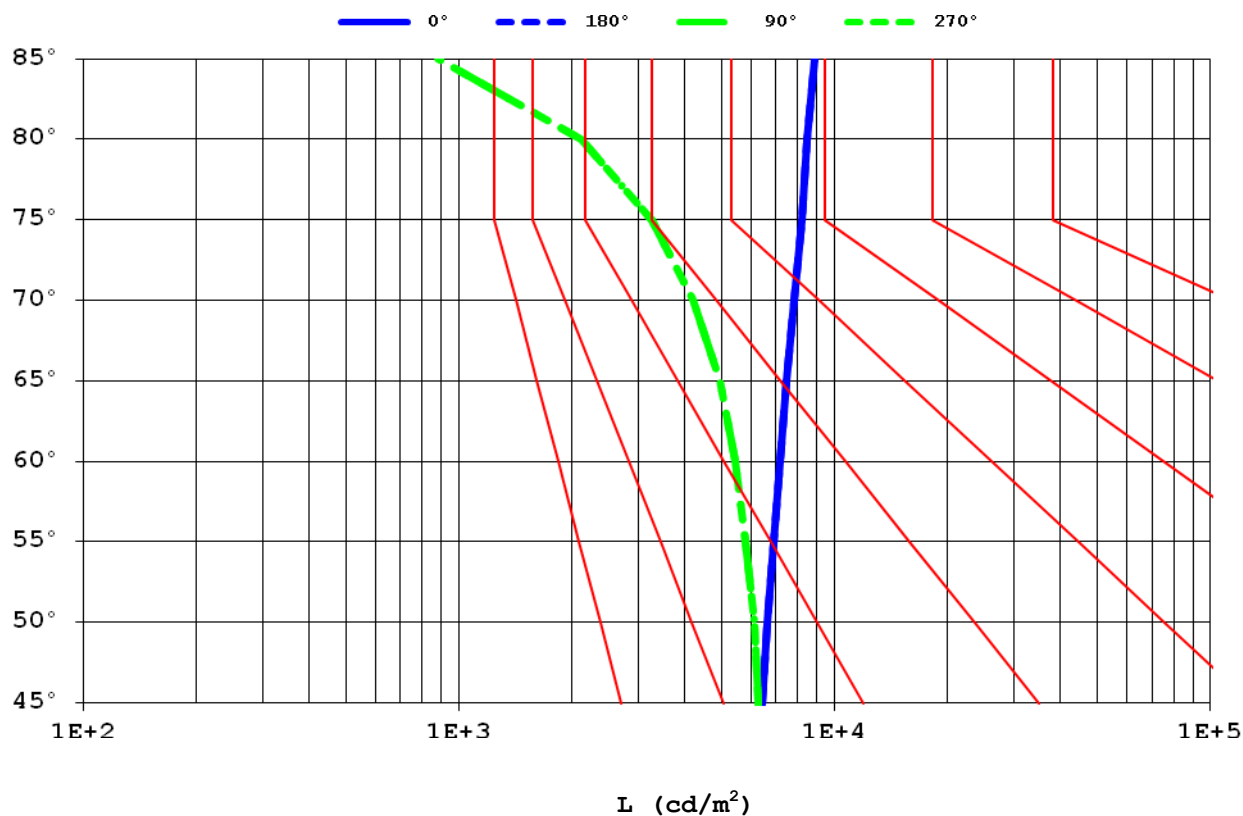
1

CIE Glare Limiting (Soellnor) Diagram

Glare Quality
Rating Class

Service values of illuminance

1.15	A	2000	1000	500	<300				
1.50	B		2000	1000	500	<300			
1.85	C			2000	1000	500	<300		
2.20	D				2000	1000	500	<300	
2.55	E					2000	1000	500	<300
		a	b	c	d	e	f	g	h



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Customer	Encapsulite International Ltd.
Luminaire Range	MT50 IP68
Luminaire catalog No.	MT50 21W
Luminaire description	linear cylindrical luminaire with clear cover data derived from range test series
Lamp description	21W/840 HE Osram Lumilux
Lamp lumen output	1,900 lm
Lamp quantity	1

Comments

It is recommended that point to point calculations are used when designing lighting schemes in order to accurately predict uniformity. Data files in various formats are available to allow easy transfer of this data to a computer. Please enquire for details.

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Customer Encapsulite International Ltd.
Luminaire Range MT50 IP68
Luminaire catalog No. MT50 21W
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with clear cover
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Lamp description 21W/840 HE Osram Lumilux
Lamp lumen output 1,900 lm
Lamp quantity 1

Quick Design Table

Based on: reflectances of Ceiling = 0.5
Wall = 0.5
Floor = 0.2
Room Index = 2.00
lamp output = 1900 lumens
ballast lumen factor = 1.00

To achieve an Illuminance of 100 lux

Surface Area (m ²)	20	30	40	50	80	100	200	300	500
No. of luminaires	1.8	2.8	3.7	4.6	7.4	9.2	18.5	27.7	46.2