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Photometric Report

Job / Report / Date

42 / 10685 / 10685-40a / 2013.05.24

Customer

Encapsulite International Ltd.

Luminaire catalog No.

MT360/SC/35W

Luminaire description

linear IP67 twin T5 fluorescent Direct/Indirect luminaire
with satin cover

Lamp description

HE 35W/840 OSRAM Lumilux Cool White

Lamp lumen output

3,300 lm

Lamp quantity

2

Photometric Report

Pictures

Luminaire information

Report basis

Polar Curves

HV Distribution Curves

Principal Axes Intensities

Light Output Ratios & CIBSE TM5 Results

Aspect Factors

Luminous intensities

Zonal Flux Calculations

Luminance calculations

VDT Luminance table

CIBSE TM10 Glare Index Results

CIE Glare Limiting (Soellnor) Diagram

Comments

Quick Design Table

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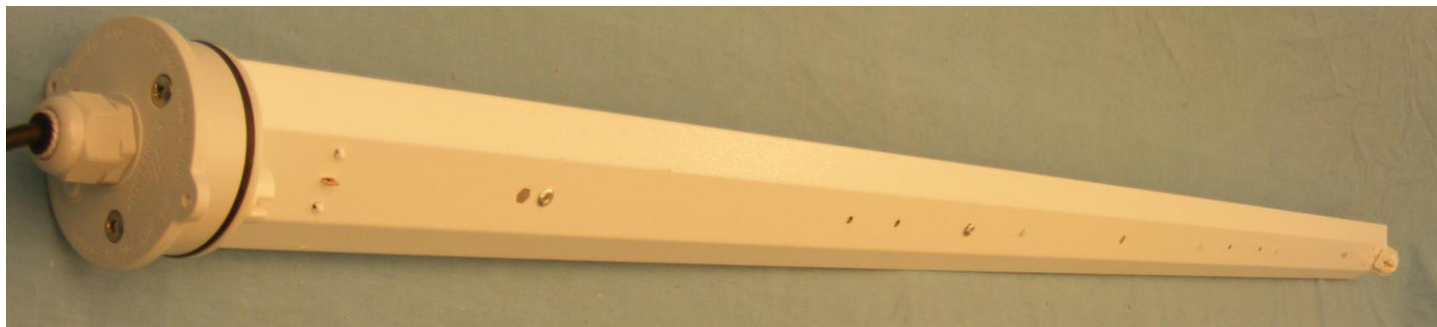
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Helvar
www.helvar.com

ELECTRONIC BALLAST EL2x14-35s
220-240V 0/50-60Hz



T5: 14,21,28,35W 0.35-0.15A λ 0.98
 $t_a = -20...+50^\circ\text{C}$



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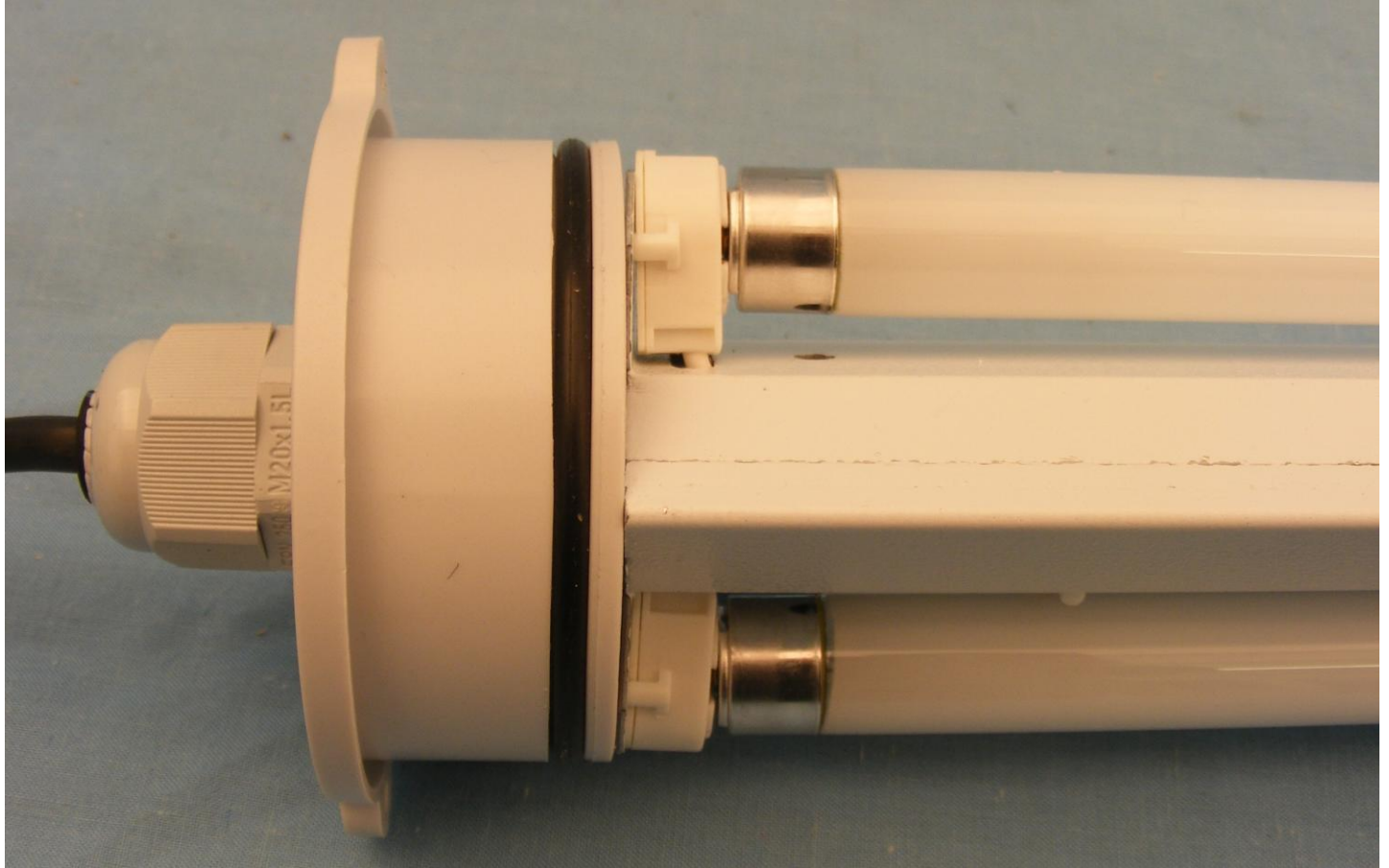
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Luminaire physical characteristics

Overall Dimensions

Length	1535mm
Width	75mm
Height	75mm

Visible Dimensions when installed

Length	1535mm
Width	75mm
Height	75mm

Luminous Dimensions

Length	1475mm
Width	69mm
Height 0°	69mm
Height 90°	69mm
Height 180°	69mm
Height 270°	69mm

Luminous Areas

Base	0.101775m ²
Sides	0.101775m ² (0°/180° azimuth)
Ends	0.004761m 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 and geartray in a horizontal orientation.

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

The photometric nadir was taken to be perpendicular to the geartray.

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 EL2x14-35s

Ballast Voltage Range 220-240V

Ballast Current Range 0.15-0.35A

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	307.0	0.993	70.1	70.6	4,995	76%	71.3
Lamp 1	230.0	344.1	0.993	78.6	79.1	3,179	96%	-
Lamp 2	230.0	346.1	0.992	79.0	79.6	3,260	99%	-
Lamp Average	230.0	345.1	0.993	78.8	79.4	3,220	98%	-
Lamp Total	230.0	345.1	0.993	78.8	79.4	6,439	98%	81.7

Electrical characteristics at 25°C

Ballast Nominal	230V	334.8mA	0.98PF	75.5W	77.0VA
Lamp Nominal	230V	304.3mA	1.00PF	70.0W	70.0VA
Luminaire	230V	307.0mA	0.99PF	70.1W	70.6VA
Lamp Total	230V	345.1mA	0.99PF	78.8W	79.4VA

Measured Electrical characteristics relative to Ballast Nominal

Luminaire	Current	92%	Power	93%	VA	92%
Lamp Total	Current	103%	Power	104%	VA	103%

Measured Electrical characteristics relative to Lamp Nominal

Luminaire	Current	101%	Power	100%	VA	101%
Lamp Total	Current	113%	Power	113%	VA	113%

Lumen Output figures used in this report (lumens)

Nominal Lamp Total Output	6,600
Measured Luminaire Output	4,995
Measured Lamp Total Output	6,439

Measured Lumen Output characteristics relative to Lamp Nominal Total

Luminaire	76%
Lamp Total	98%

Measured luminous efficacy at 25°C

Luminaire	71.3 lm/W
Lamp Total	81.7 lm/W

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The light output ratio of the luminaire was measured as 0.776 at 25°C.

This is the ratio of the output of the luminaire to the output of the sum of the lamps.

The measured lumen output of the luminaire was 4,995 lumens at 25°C.

This figure can be related to the total nominal lumen output of the lamps quoted by the manufacturer of 6,600 ($2 * 3,300$) lumens, to give a nominal light output ratio of 0.757.

The total measured lumen output of the lamps and gear combination and gear combination was 6,439 lumens at 25°C.

The average of the measured lumen output of the lamps was therefore 3,220 lumens at 25°C.

This figure can be related to the total nominal lumen output of the lamps quoted by the manufacturer of 6,600 ($2 * 3,300$) lumens, to give a nominal BLF of 0.976.

For lighting design calculations:

A light output ratio of 1 should be used in conjunction with the measured lumen output of the luminaire of 4,995 lumens.

or

The nominal light output ratio of 0.757 should be used in conjunction with the nominal lumen output of the lamps of 6,600 ($2 * 3,300$) lumens.

or

The measured light output ratio of 0.776 should be used in conjunction with the total measured lumen output of the lamps of 6,439 ($2 * 3,220$) lumens.

or

The measured light output ratio of 0.776 should be used in conjunction with the nominal lumen output of the lamps of 6,600 ($2 * 3,300$) lumens and the nominal BLF of 0.976.

This report is based on the following parameters:

The Light Output Ratio is the nominal value of 0.757.

The lamp output is the nominal value of 3,300 lumens.

There are 2 lamps 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 lamps 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 from the published lumen output, represented by the nominal BLF.

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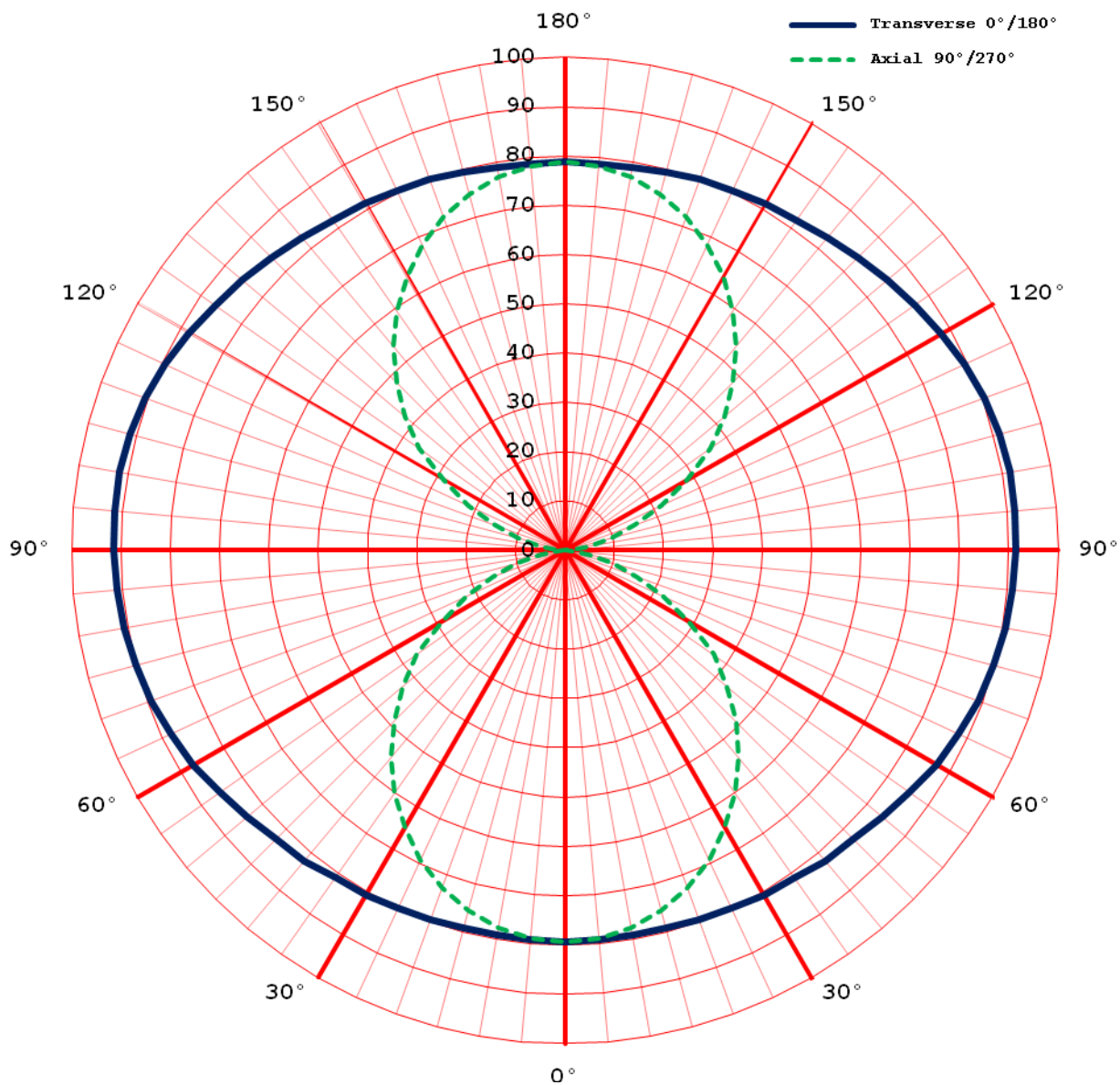
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Average Principal Axes Luminous Intensities (cd/klm)



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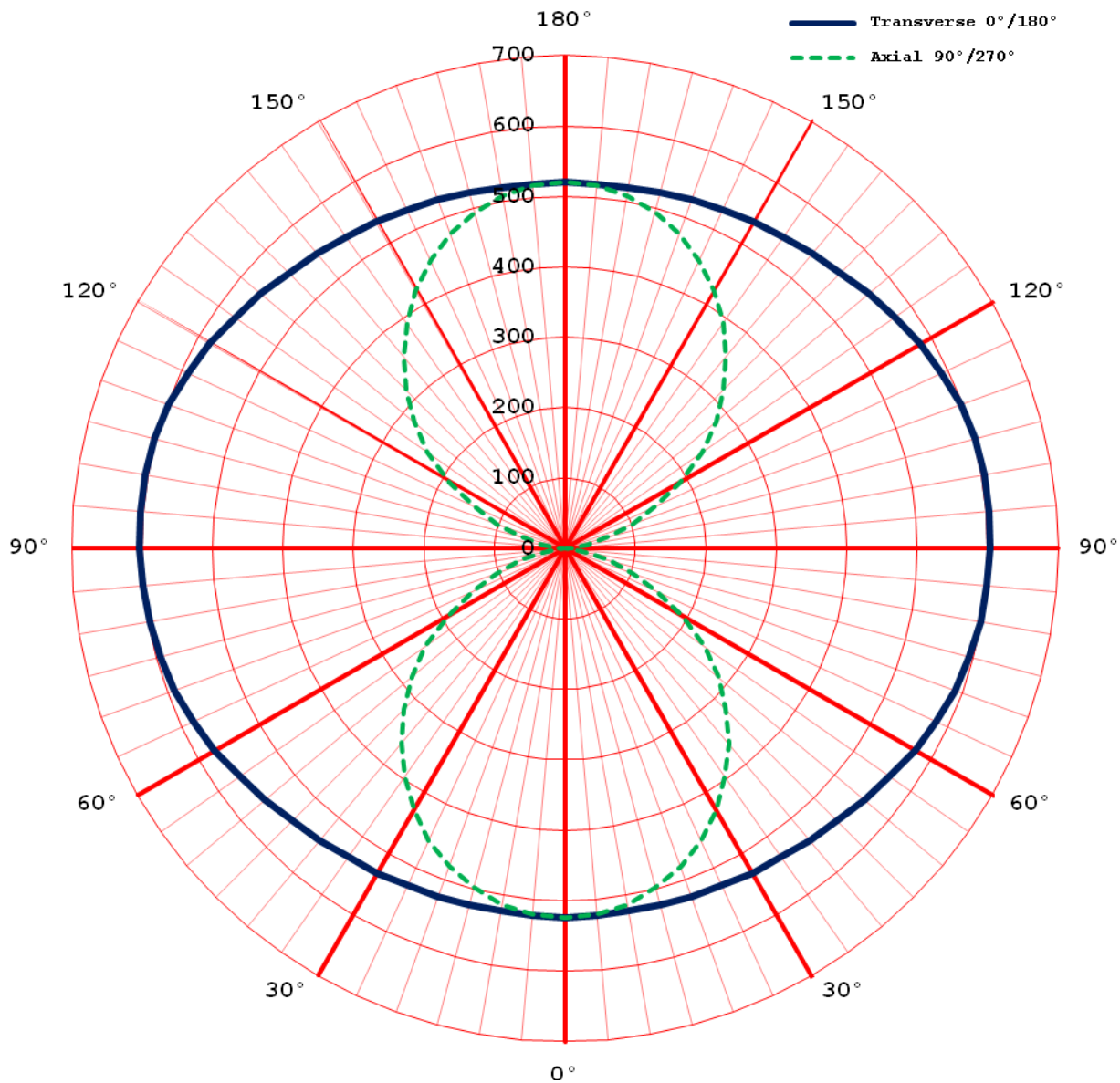
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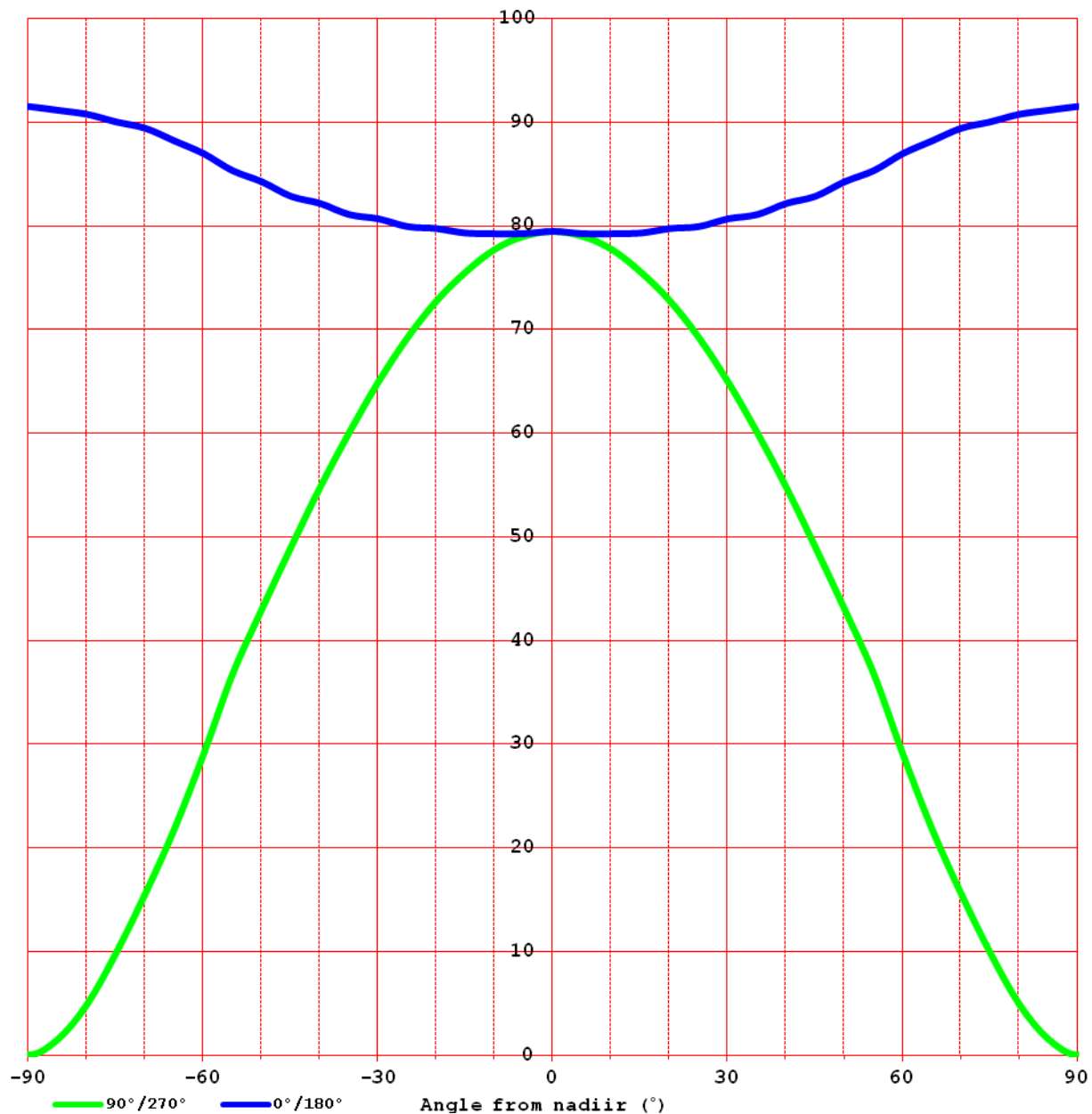
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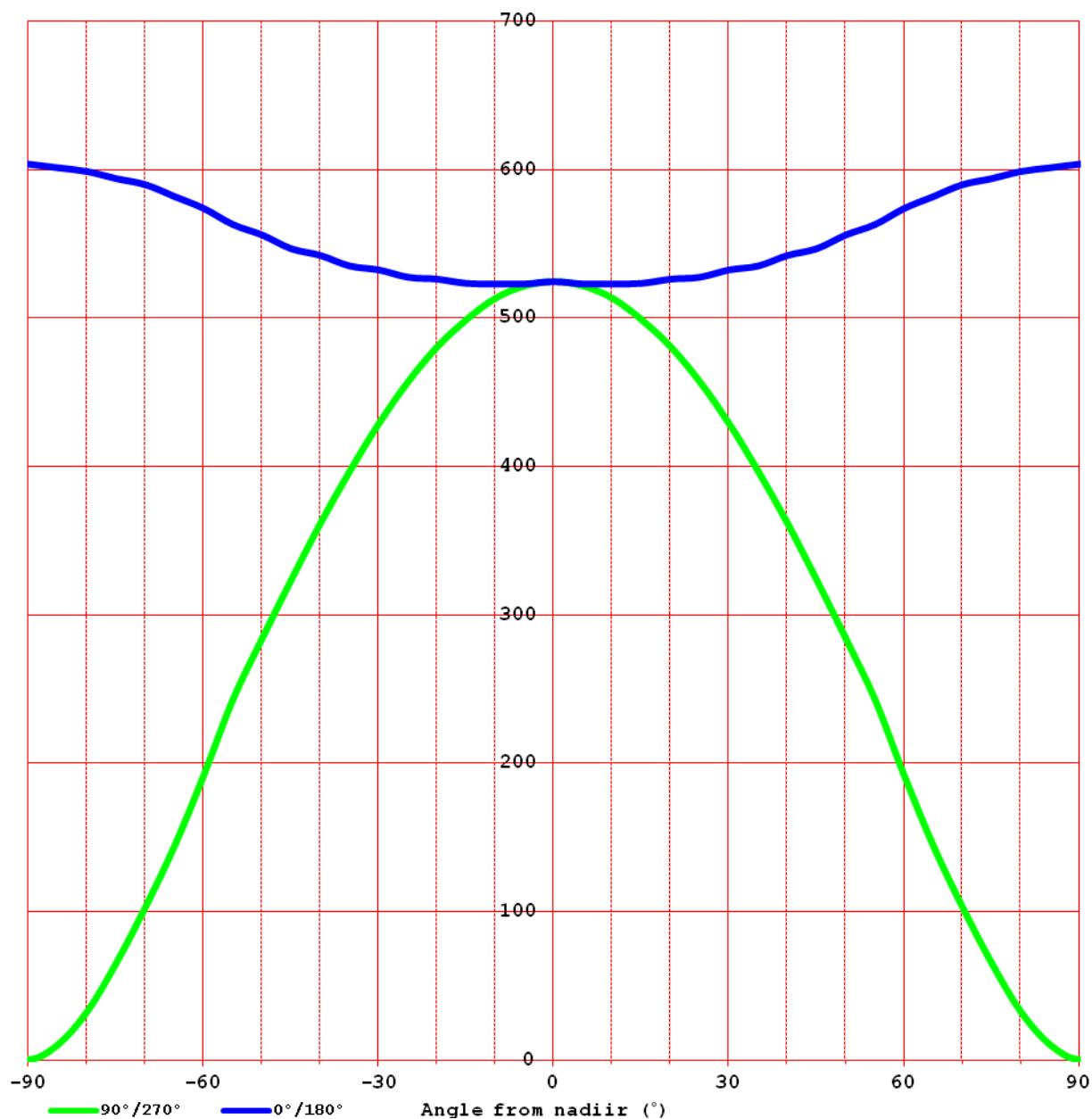
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Average Luminous Intensities (cd/Klm)

Angle	Transverse plane	Axial plane
0°	79.450	79.450
5°	79.227	78.990
10°	79.216	77.741
15°	79.282	75.552
20°	79.713	72.777
25°	79.910	69.208
30°	80.654	64.946
35°	81.061	60.065
40°	82.132	54.779
45°	82.819	48.997
50°	84.220	43.014
55°	85.285	36.792
60°	86.930	29.044
65°	88.146	21.841
70°	89.357	15.580
75°	89.974	9.875
80°	90.706	4.912
85°	91.088	1.547
90°	91.453	0.045
95°	91.655	1.600
100°	91.683	4.911
105°	91.359	9.753
110°	90.547	15.308
115°	89.367	21.605
120°	88.110	28.513
125°	86.629	36.114
130°	85.374	42.366
135°	83.932	48.190
140°	82.945	53.952
145°	81.869	59.246
150°	81.212	64.105
155°	80.428	68.302
160°	80.029	72.036
165°	79.404	74.877
170°	78.860	77.009
175°	78.681	78.302
180°	78.742	78.742

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Average Luminous Intensities (cd)

Angle	Transverse plane	Axial plane
0°	524.368	524.368
5°	522.901	521.332
10°	522.828	513.093
15°	523.258	498.645
20°	526.103	480.325
25°	527.408	456.776
30°	532.316	428.641
35°	535.002	396.428
40°	542.074	361.540
45°	546.605	323.382
50°	555.855	283.890
55°	562.880	242.825
60°	573.737	191.687
65°	581.765	144.149
70°	589.759	102.828
75°	593.831	65.173
80°	598.661	32.420
85°	601.178	10.209
90°	603.589	0.295
95°	604.926	10.562
100°	605.109	32.413
105°	602.966	64.368
110°	597.612	101.031
115°	589.825	142.593
120°	581.526	188.184
125°	571.750	238.352
130°	563.467	279.615
135°	553.949	318.054
140°	547.438	356.086
145°	540.338	391.026
150°	536.001	423.091
155°	530.827	450.792
160°	528.189	475.438
165°	524.068	494.185
170°	520.477	508.258
175°	519.293	516.792
180°	519.698	519.698

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Light Output Ratios	Up	0.37
	Down	0.38
	Total	0.76

Spacing to Height Ratios	SHR NOM	1.75
	SHR MAX	1.89
	SHR MAX TRANS	2.61

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	.37	.42	.46	.51	.54	.57	.60	.63	
	.30		N/A	.32	.36	.40	.46	.49	.52	.56	.59	
	.10		N/A	.27	.32	.36	.41	.45	.49	.53	.56	
.50	.50	.20	N/A	.32	.35	.38	.42	.45	.47	.50	.52	
	.30		N/A	.27	.31	.34	.39	.42	.44	.48	.50	
	.10		N/A	.24	.27	.31	.35	.39	.41	.45	.48	
.30	.50	.20	N/A	.26	.29	.32	.35	.37	.39	.42	.43	
	.30		N/A	.23	.26	.28	.32	.35	.37	.39	.41	
	.10		N/A	.20	.23	.26	.30	.32	.34	.38	.40	
.00	.00	.00	N/A	.14	.16	.18	.21	.23	.24	.26	.28	
BZ Class			N/A	6	7	7	7	7	7	7	7	

CIE Flux code 30 / 56 / 79 / 50 / 76

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	0.26	0.32	0.38	0.43	0.51	0.57	0.60	0.65	0.66	0.68	0.65					
CIE class	8	/	8	/	8	/	8	/	8	/	9	/	9	/	-	/	-

Flux Fraction Ratio 0.98
DIN Class 0.76 C

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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Angle

Aspect Factors

	Parallel plane	Perpendicular plane
0°	0.000	0.000
5°	0.087	0.004
10°	0.172	0.015
15°	0.254	0.033
20°	0.332	0.058
25°	0.404	0.088
30°	0.469	0.122
35°	0.527	0.158
40°	0.577	0.197
45°	0.619	0.235
50°	0.653	0.273
55°	0.680	0.307
60°	0.700	0.338
65°	0.712	0.363
70°	0.720	0.382
75°	0.724	0.395
80°	0.726	0.403
85°	0.727	0.406
90°	0.727	0.407

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Zonal Flux Calculations

Angles	Individual	Cumulative
0° - 5°	0.3%	0.3%
5° - 10°	0.7%	1.0%
10° - 15°	1.2%	2.2%
15° - 20°	1.7%	3.9%
20° - 25°	2.1%	6.0%
25° - 30°	2.5%	8.5%
30° - 35°	2.8%	11.3%
35° - 40°	3.1%	14.3%
40° - 45°	3.3%	17.6%
45° - 50°	3.5%	21.1%
50° - 55°	3.6%	24.8%
55° - 60°	3.7%	28.4%
60° - 65°	3.7%	32.2%
65° - 70°	3.7%	35.9%
70° - 75°	3.7%	39.6%
75° - 80°	3.7%	43.2%
80° - 85°	3.6%	46.8%
85° - 90°	3.6%	50.4%
90° - 95°	3.5%	53.9%
95° - 100°	3.6%	57.5%
100° - 105°	3.6%	61.1%
105° - 110°	3.6%	64.7%
110° - 115°	3.6%	68.4%
115° - 120°	3.6%	72.0%
120° - 125°	3.6%	75.6%
125° - 130°	3.5%	79.2%
130° - 135°	3.4%	82.6%
135° - 140°	3.3%	85.8%
140° - 145°	3.0%	88.9%
145° - 150°	2.8%	91.6%
150° - 155°	2.4%	94.1%
155° - 160°	2.1%	96.1%
160° - 165°	1.7%	97.8%
165° - 170°	1.2%	99.0%
170° - 175°	0.7%	99.8%
175° - 180°	0.2%	100.0%

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Averaged Luminance Values (cd/m²)

Elevation(°)	Azimuth(°)						
	0.0°	15.0°	30.0°	45.0°	60.0°	75.0°	90.0°
45°	3798	3667	3699	3562	3476	3604	4293
50°	3877	3725	3725	3517	3347	3398	4110
55°	3971	3771	3771	3490	3218	3169	3899
60°	4127	3874	3844	3486	3079	2846	3485
65°	4301	3983	3946	3524	2991	2561	3046
70°	4521	4175	4099	3608	2962	2342	2618
75°	4764	4386	4291	3739	2960	2150	2106
80°	5078	4647	4522	3935	3024	2028	1450
85°	5452	4959	4822	4225	3213	1944	750
	90.0°	105.0°	120.0°	135.0°	150.0°	165.0°	180.0°
45°	4293	3604	3476	3562	3699	3667	3798
50°	4110	3398	3347	3517	3725	3725	3877
55°	3899	3169	3218	3490	3771	3771	3971
60°	3485	2846	3079	3486	3844	3874	4127
65°	3046	2561	2991	3524	3946	3983	4301
70°	2618	2342	2962	3608	4099	4175	4521
75°	2106	2150	2960	3739	4291	4386	4764
80°	1450	2028	3024	3935	4522	4647	5078
85°	750	1944	3213	4225	4822	4959	5452
	180.0°	195.0°	210.0°	225.0°	240.0°	255.0°	270.0°
45°	3798	3667	3699	3562	3476	3604	4293
50°	3877	3725	3725	3517	3347	3398	4110
55°	3971	3771	3771	3490	3218	3169	3899
60°	4127	3874	3844	3486	3079	2846	3485
65°	4301	3983	3946	3524	2991	2561	3046
70°	4521	4175	4099	3608	2962	2342	2618
75°	4764	4386	4291	3739	2960	2150	2106
80°	5078	4647	4522	3935	3024	2028	1450
85°	5452	4959	4822	4225	3213	1944	750
	270.0°	285.0°	300.0°	315.0°	330.0°	345.0°	0.0°
45°	4293	3604	3476	3562	3699	3667	3798
50°	4110	3398	3347	3517	3725	3725	3877
55°	3899	3169	3218	3490	3771	3771	3971
60°	3485	2846	3079	3486	3844	3874	4127
65°	3046	2561	2991	3524	3946	3983	4301
70°	2618	2342	2962	3608	4099	4175	4521
75°	2106	2150	2960	3739	4291	4386	4764
80°	1450	2028	3024	3935	4522	4647	5078
85°	750	1944	3213	4225	4822	4959	5452

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 Luminaire description linear IP67 twin T5 fluorescent Direct/Indirect luminaire with satin cover
 Lamp description HE 35W/840 OSRAM Lumilux Cool White
 Lamp lumen output 3,300 lm
 Lamp quantity 2

Non averaged Luminance Values (cd/m²)

Elevation(°)	Azimuth(°)						
	0.0°	15.0°	30.0°	45.0°	60.0°	75.0°	90.0°
45°	3628	3505	3558	3447	3399	3562	4294
50°	3687	3543	3569	3394	3261	3362	4111
55°	3773	3583	3608	3359	3118	3132	3893
60°	3940	3726	3706	3363	3006	2816	3482
65°	4139	3888	3848	3411	2928	2557	3033
70°	4393	4122	4041	3512	2899	2341	2625
75°	4662	4369	4267	3660	2903	2162	2108
80°	4990	4693	4552	3876	2980	1999	1473
85°	5363	5046	4890	4178	3180	1904	769
	90.0°	105.0°	120.0°	135.0°	150.0°	165.0°	180.0°
45°	4294	3670	3576	3700	3865	3843	3967
50°	4111	3466	3450	3671	3908	3925	4066
55°	3893	3241	3328	3660	3964	3982	4169
60°	3482	2917	3175	3649	4020	4049	4314
65°	3033	2605	3079	3676	4100	4106	4463
70°	2625	2382	3046	3740	4223	4251	4649
75°	2108	2187	3037	3845	4399	4420	4866
80°	1473	2084	3085	4018	4580	4635	5165
85°	769	2003	3261	4297	4843	4928	5541
	180.0°	195.0°	210.0°	225.0°	240.0°	255.0°	270.0°
45°	3967	3810	3829	3652	3540	3619	4291
50°	4066	3888	3869	3615	3412	3411	4110
55°	4169	3941	3930	3590	3283	3180	3905
60°	4314	4025	3995	3579	3126	2853	3487
65°	4463	4094	4076	3608	3026	2557	3059
70°	4649	4258	4204	3672	2990	2323	2610
75°	4866	4439	4369	3780	2980	2128	2104
80°	5165	4692	4594	3963	3038	2020	1427
85°	5541	5003	4895	4249	3230	1949	731
	270.0°	285.0°	300.0°	315.0°	330.0°	345.0°	0.0°
45°	4291	3567	3391	3451	3542	3508	3628
50°	4110	3353	3265	3389	3553	3543	3687
55°	3905	3123	3142	3351	3581	3578	3773
60°	3487	2798	3008	3351	3654	3694	3940
65°	3059	2525	2933	3402	3760	3846	4139
70°	2610	2321	2911	3508	3927	4069	4393
75°	2104	2125	2922	3671	4130	4314	4662
80°	1427	2009	2993	3882	4362	4567	4990
85°	731	1919	3181	4176	4658	4857	5363

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Averaged Luminance Values (cd/m²/klm)

Elevation(°)	Azimuth(°)						
	0.0°	15.0°	30.0°	45.0°	60.0°	75.0°	90.0°
45°	575	556	560	540	527	546	650
50°	587	564	564	533	507	515	623
55°	602	571	571	529	488	480	591
60°	625	587	582	528	466	431	528
65°	652	604	598	534	453	388	461
70°	685	633	621	547	449	355	397
75°	722	664	650	567	449	326	319
80°	769	704	685	596	458	307	220
85°	826	751	731	640	487	294	114
	90.0°	105.0°	120.0°	135.0°	150.0°	165.0°	180.0°
45°	650	546	527	540	560	556	575
50°	623	515	507	533	564	564	587
55°	591	480	488	529	571	571	602
60°	528	431	466	528	582	587	625
65°	461	388	453	534	598	604	652
70°	397	355	449	547	621	633	685
75°	319	326	449	567	650	664	722
80°	220	307	458	596	685	704	769
85°	114	294	487	640	731	751	826
	180.0°	195.0°	210.0°	225.0°	240.0°	255.0°	270.0°
45°	575	556	560	540	527	546	650
50°	587	564	564	533	507	515	623
55°	602	571	571	529	488	480	591
60°	625	587	582	528	466	431	528
65°	652	604	598	534	453	388	461
70°	685	633	621	547	449	355	397
75°	722	664	650	567	449	326	319
80°	769	704	685	596	458	307	220
85°	826	751	731	640	487	294	114
	270.0°	285.0°	300.0°	315.0°	330.0°	345.0°	0.0°
45°	650	546	527	540	560	556	575
50°	623	515	507	533	564	564	587
55°	591	480	488	529	571	571	602
60°	528	431	466	528	582	587	625
65°	461	388	453	534	598	604	652
70°	397	355	449	547	621	633	685
75°	319	326	449	567	650	664	722
80°	220	307	458	596	685	704	769
85°	114	294	487	640	731	751	826

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 Lamp lumen output 3,300 lm
 Lamp quantity 2

Non averaged Luminance Values (cd/m²/klm)

Elevation(°)	Azimuth(°)						
	0.0°	15.0°	30.0°	45.0°	60.0°	75.0°	90.0°
45°	550	531	539	522	515	540	651
50°	559	537	541	514	494	509	623
55°	572	543	547	509	472	475	590
60°	597	564	562	510	456	427	528
65°	627	589	583	517	444	387	460
70°	666	625	612	532	439	355	398
75°	706	662	646	554	440	328	319
80°	756	711	690	587	452	303	223
85°	813	765	741	633	482	288	117
	90.0°	105.0°	120.0°	135.0°	150.0°	165.0°	180.0°
45°	651	556	542	561	586	582	601
50°	623	525	523	556	592	595	616
55°	590	491	504	555	601	603	632
60°	528	442	481	553	609	613	654
65°	460	395	467	557	621	622	676
70°	398	361	462	567	640	644	704
75°	319	331	460	583	666	670	737
80°	223	316	467	609	694	702	783
85°	117	303	494	651	734	747	840
	180.0°	195.0°	210.0°	225.0°	240.0°	255.0°	270.0°
45°	601	577	580	553	536	548	650
50°	616	589	586	548	517	517	623
55°	632	597	595	544	497	482	592
60°	654	610	605	542	474	432	528
65°	676	620	618	547	458	387	463
70°	704	645	637	556	453	352	395
75°	737	673	662	573	452	322	319
80°	783	711	696	600	460	306	216
85°	840	758	742	644	489	295	111
	270.0°	285.0°	300.0°	315.0°	330.0°	345.0°	0.0°
45°	650	540	514	523	537	532	550
50°	623	508	495	514	538	537	559
55°	592	473	476	508	543	542	572
60°	528	424	456	508	554	560	597
65°	463	383	444	516	570	583	627
70°	395	352	441	532	595	617	666
75°	319	322	443	556	626	654	706
80°	216	304	453	588	661	692	756
85°	111	291	482	633	706	736	813

Job / Report / Date 42 / 10685 / 10685-40a / 2013.05.24

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Lamp lumen output 3,300 lm
Lamp quantity 2

Maximum Non averaged Luminance Values (cd/m²)

Elevation(°)

	Maximum	Azimuth Angle

45°	4294	90°
50°	4111	90°
55°	4169	180°
60°	4314	180°
65°	4463	180°
70°	4649	180°
75°	4866	180°
80°	5165	180°
85°	5541	180°

Job / Report / Date 42 / 10685 / 10685-40a / 2013.05.24

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Lamp quantity 2

VDI 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

VDI 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

Job / Report / Date

42 / 10685 / 10685-40a / 2013.05.24

Customer

Encapsulite International Ltd.

Luminaire catalog No.

MT360/SC/35W

Luminaire description

linear IP67 twin T5 fluorescent Direct/Indirect luminaire
with satin cover

Lamp description

HE 35W/840 OSRAM Lumilux Cool White

Lamp lumen output

3,300 lm

Lamp quantity

2

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°

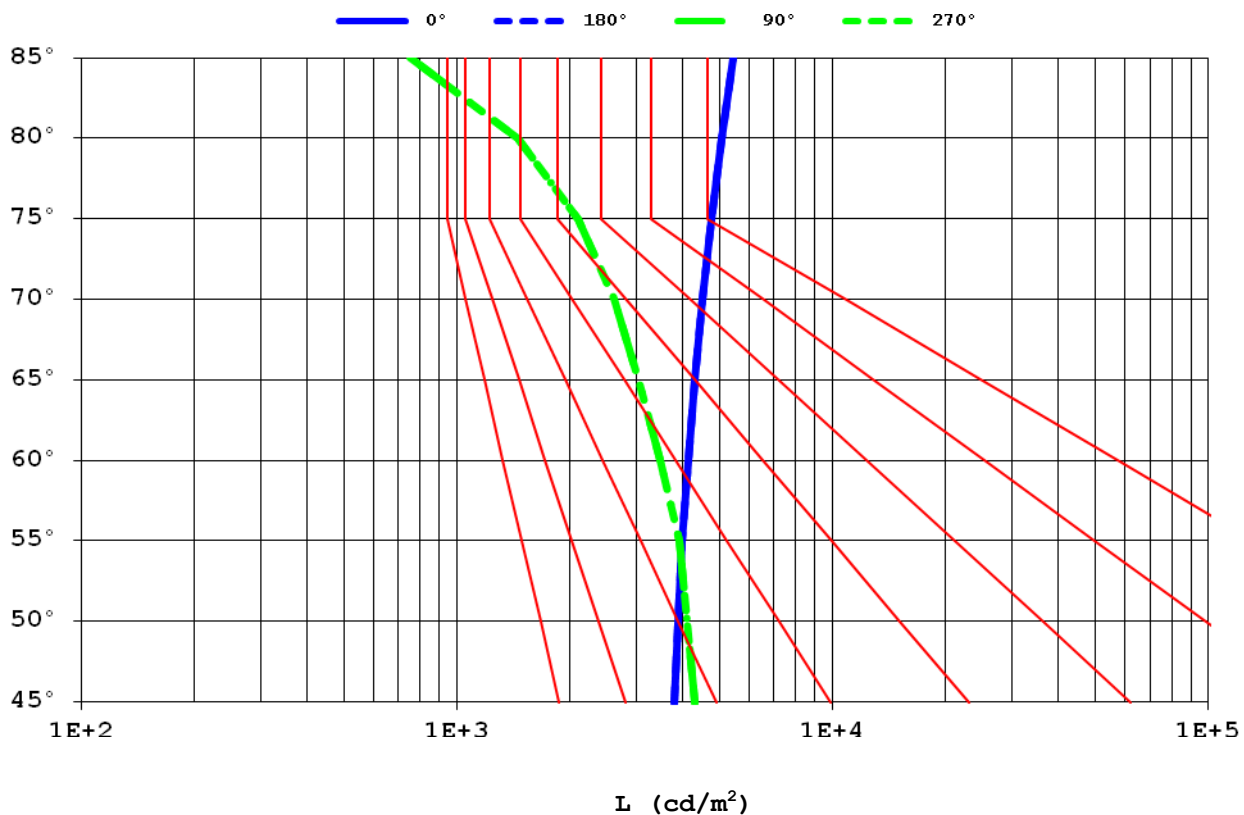
2H 2H	6.8	8.0	8.0	9.2	10.8	2.4	3.6	3.5	4.8	6.3
3H	10.4	11.5	11.6	12.7	14.3	4.2	5.3	5.3	6.5	8.1
4H	12.2	13.2	13.4	14.5	16.1	4.8	5.8	5.9	7.0	8.6
6H	14.1	15.1	15.3	16.3	18.0	5.2	6.2	6.4	7.4	9.1
8H	15.1	16.1	16.3	17.3	18.9	5.3	6.3	6.5	7.5	9.1
12H	16.1	17.1	17.3	18.3	19.9	5.3	6.3	6.5	7.5	9.1
4H 2H	7.6	8.7	8.8	9.9	11.5	4.8	5.8	6.0	7.1	8.7
3H	11.6	12.5	12.8	13.8	15.4	6.9	7.8	8.1	9.0	10.7
4H	13.7	14.5	14.9	15.8	17.4	7.8	8.6	9.0	9.9	11.5
6H	15.8	16.6	17.0	17.8	19.5	8.4	9.2	9.7	10.5	12.1
8H	16.9	17.7	18.2	18.9	20.6	8.7	9.4	9.9	10.7	12.3
12H	18.2	18.8	19.4	20.1	21.8	8.8	9.5	10.1	10.8	12.5
8H 4H	14.3	15.0	15.5	16.3	17.9	10.3	11.1	11.6	12.3	14.0
6H	16.7	17.3	18.0	18.6	20.3	11.3	11.9	12.6	13.2	14.9
8H	18.2	18.7	19.4	20.0	21.7	11.8	12.3	13.1	13.6	15.3
12H	19.6	20.1	20.9	21.4	23.1	12.1	12.6	13.4	13.9	15.6
12H 4H	14.4	15.1	15.6	16.3	18.0	11.5	12.2	12.7	13.4	15.1
6H	17.0	17.6	18.3	18.9	20.5	12.8	13.3	14.0	14.6	16.3
8H	18.5	19.0	19.8	20.3	21.9	13.3	13.8	14.6	15.1	16.8

Calculated in accordance with CIBSE Technical Memorandum No. 10 1985

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CIE Glare Limiting (Soellnor) Diagram

Glare Rating	Quality 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



Job / Report / Date	42 / 10685 / 10685-40a / 2013.05.24
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Lamp lumen output	3,300 lm
Lamp quantity	2

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.

Job / Report / Date 42 / 10685 / 10685-40a / 2013.05.24

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Quick Design Table

Based on: reflectances of Ceiling = 0.5
Wall = 0.5
Floor = 0.2
Room Index = 2.00
lamp output = 3300 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	0.7	1.1	1.4	1.8	2.9	3.6	7.1	10.7	17.8