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Photometric Report

Job / Report / Date 42 / 10692 / 10692-13a / 2013.06.17

Customer	Encapsulite International Ltd.
Luminaire Range	MT70 IP68
Luminaire catalog No.	MT70 58W
Luminaire description	linear cylindrical luminaire with clear cover data derived from range test series
Lamp description	58W/840 F T8 Sylvania Luxline Plus
Lamp lumen output	5,200 lm
Lamp quantity	1

Photometric Report

- Pictures
- Luminaire information
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- Principal Axes Intensities
- Light Output Ratios & CIBSE TM5 Results
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Job / Report / Date

42 / 10692 / 10692-13a / 2013.06.17

Customer

Encapsulite International Ltd.

Luminaire Range

MT70 IP68

Luminaire catalog No.

MT70 58W

Luminaire description

linear cylindrical luminaire
with clear cover

Lamp description

data derived from range test series

Lamp lumen output

58W/840 F T8 Sylvania Luxline Plus

Lamp quantity

5,200 lm

1



Helvar
www.helvar.com

ELECTRONIC BALLAST EL1x58s
220-240V 0/50-60Hz



T8: 1x58W 0.26-0.23A λ 0.98
 $t_a = -20...+50$ °C

SYLVANIA
LUXLINE PLUS

F58W / 840 -T8

COOL WHITE DE LUXE

www.havells-sylvania.com

MADE IN GERMANY



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Luminaire physical characteristics

Overall Dimensions

Length	1616mm
Width	70mm
Height	70mm

Visible Dimensions when installed

Length	1616mm
Width	70mm
Height	70mm

Luminous Dimensions

Length	1554mm
Width	70mm
Height 0°	35mm
Height 90°	0mm
Height 180°	35mm
Height 270°	0mm

Luminous Areas

Base	0.10878m ²
Sides	0.05439m 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 EL1x58s

Ballast Voltage Range 220-240V
Ballast Current Range 0.23-0.26A
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	226.3	0.988	51.4	52.1	3,602	69%	70.1
Lamp	230.0	236.4	0.989	53.8	54.4	4,264	82%	79.3

Electrical characteristics at 25°C

Ballast Nominal	230V	244.3mA	0.98PF	55.1W	56.2VA
Lamp Nominal	230V	252.2mA	1.00PF	58.0W	58.0VA
Luminaire	230V	226.3mA	0.99PF	51.4W	52.1VA
Lamp	230V	236.4mA	0.99PF	53.8W	54.4VA

Measured Electrical characteristics relative to Ballast Nominal

Luminaire	Current	93%	Power	93%	VA	93%
Lamp	Current	97%	Power	98%	VA	97%

Measured Electrical characteristics relative to Lamp Nominal

Luminaire	Current	90%	Power	89%	VA	90%
Lamp	Current	94%	Power	93%	VA	94%

Lumen Output figures used in this report (lumens)

Nominal Lamp Output	5,200
Measured Luminaire Output	3,602
Measured Lamp Output	4,264

Measured Lumen Output characteristics relative to Lamp Nominal Total

Luminaire	69%
Lamp	82%

Measured luminous efficacy at 25°C

Luminaire	70.1 lm/W
Lamp	79.3 lm/W

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The light output ratio of the luminaire was measured as 0.845 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 3,602 lumens at 25°C.
This figure can be related to the nominal lumen output of the lamp quoted by the manufacturer of 5,200 lumens, to give a nominal light output ratio of 0.693.

The measured lumen output of the lamp was 4,264 lumens at 25°C.
This figure can be related to the nominal lumen output of the lamp quoted by the manufacturer of 5,200 lumens, to give a nominal BLF of 0.82.

For lighting design calculations:

A light output ratio of 1 should be used in conjunction with the measured lumen output of the luminaire of 3,602 lumens.

or

The nominal light output ratio of 0.693 should be used in conjunction with the nominal lumen output of the lamp of 5,200 lumens.

or

The measured light output ratio of 0.845 should be used in conjunction with the measured lumen output of the lamp of 4,264 lumens.

or

The measured light output ratio of 0.845 should be used in conjunction with the nominal lumen output of the lamp of 5,200 lumens and the nominal BLF of 0.82.

This report is based on the following parameters:

The Light Output Ratio is the nominal value of 0.693.

The lamp output is the nominal value of 5,200 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

58W/840 F T8 Sylvania Luxline Plus

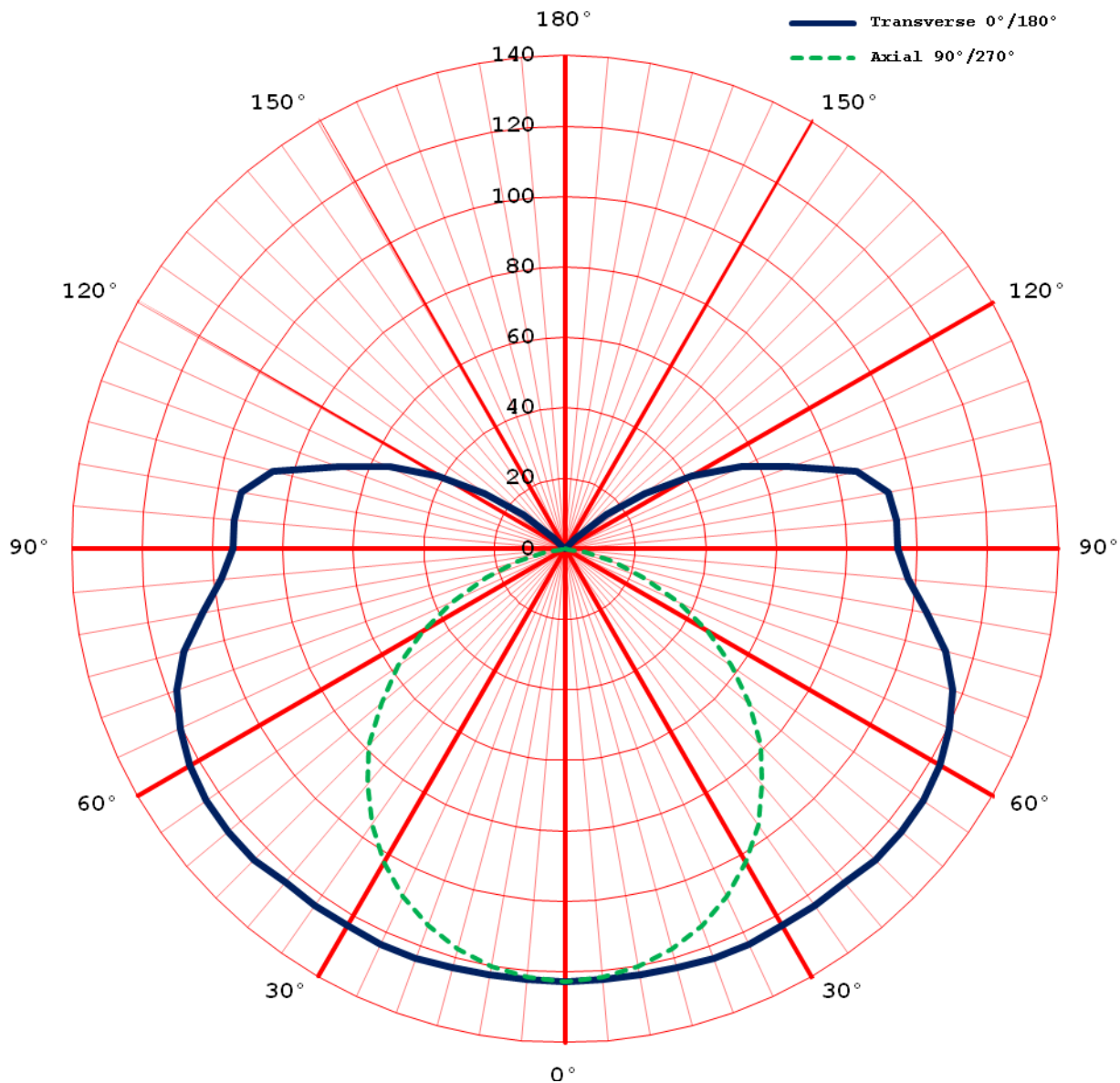
Lamp lumen output

5,200 lm

Lamp quantity

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Average Principal Axes Luminous Intensities (cd/klm)



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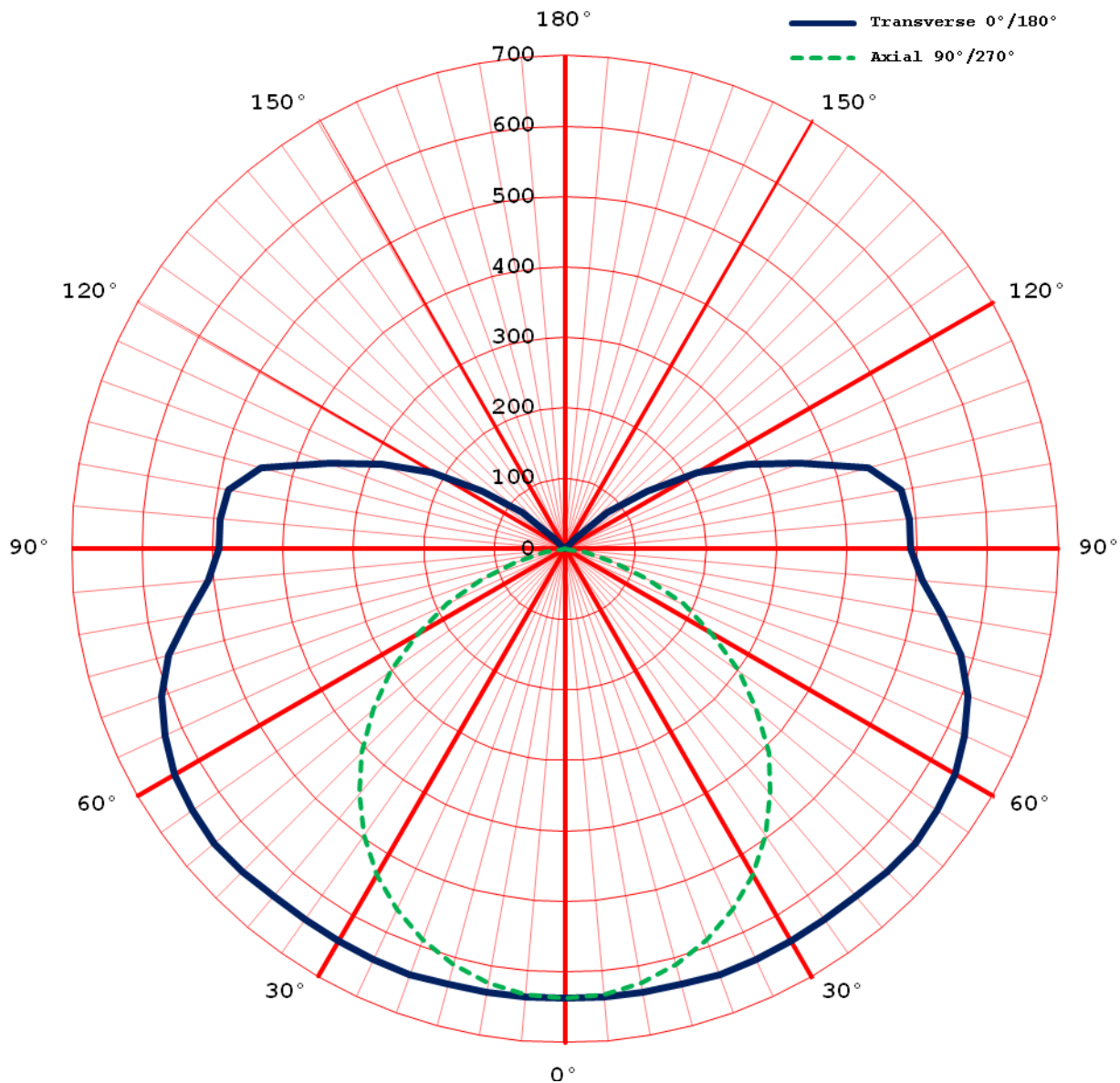
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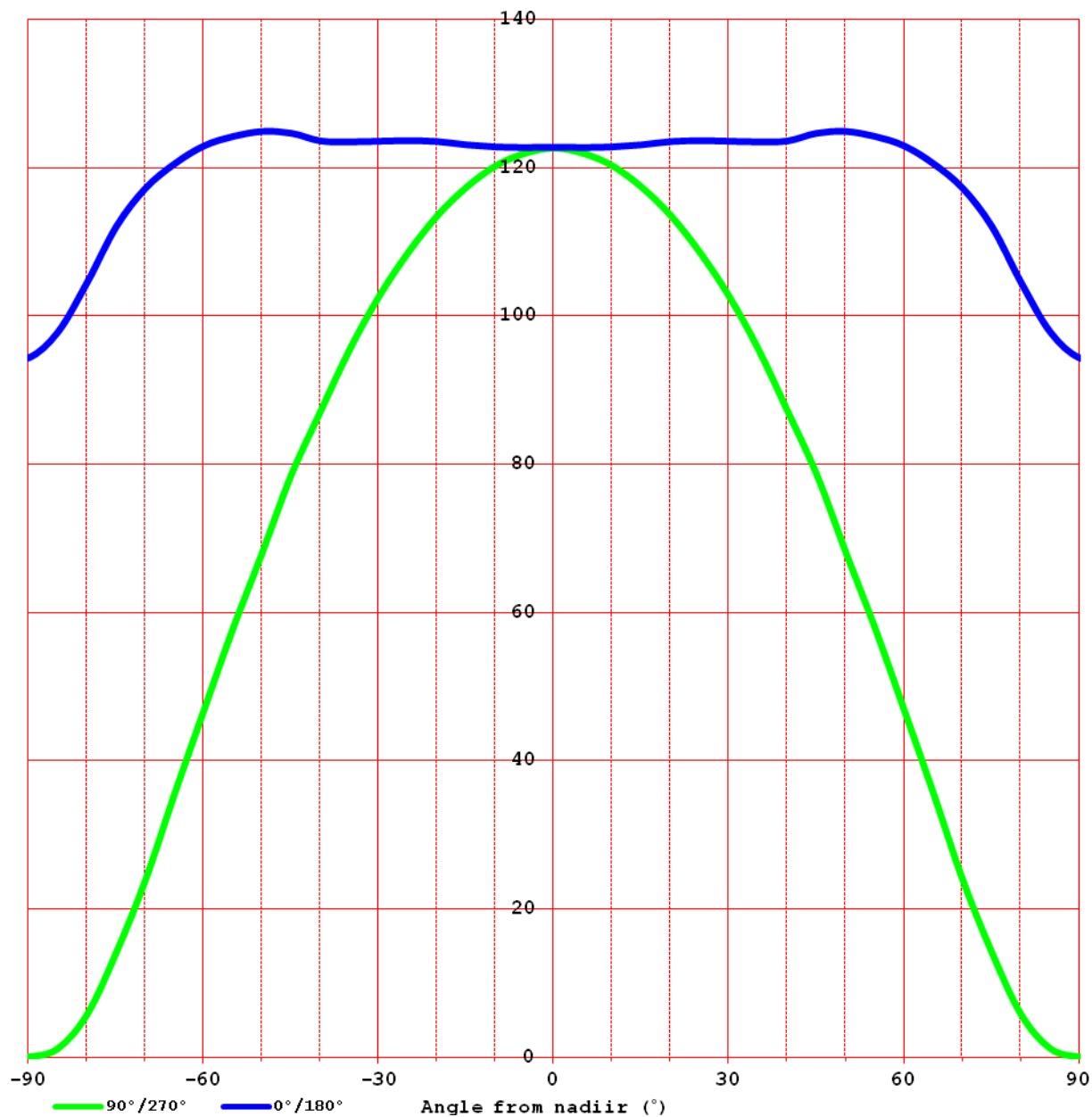
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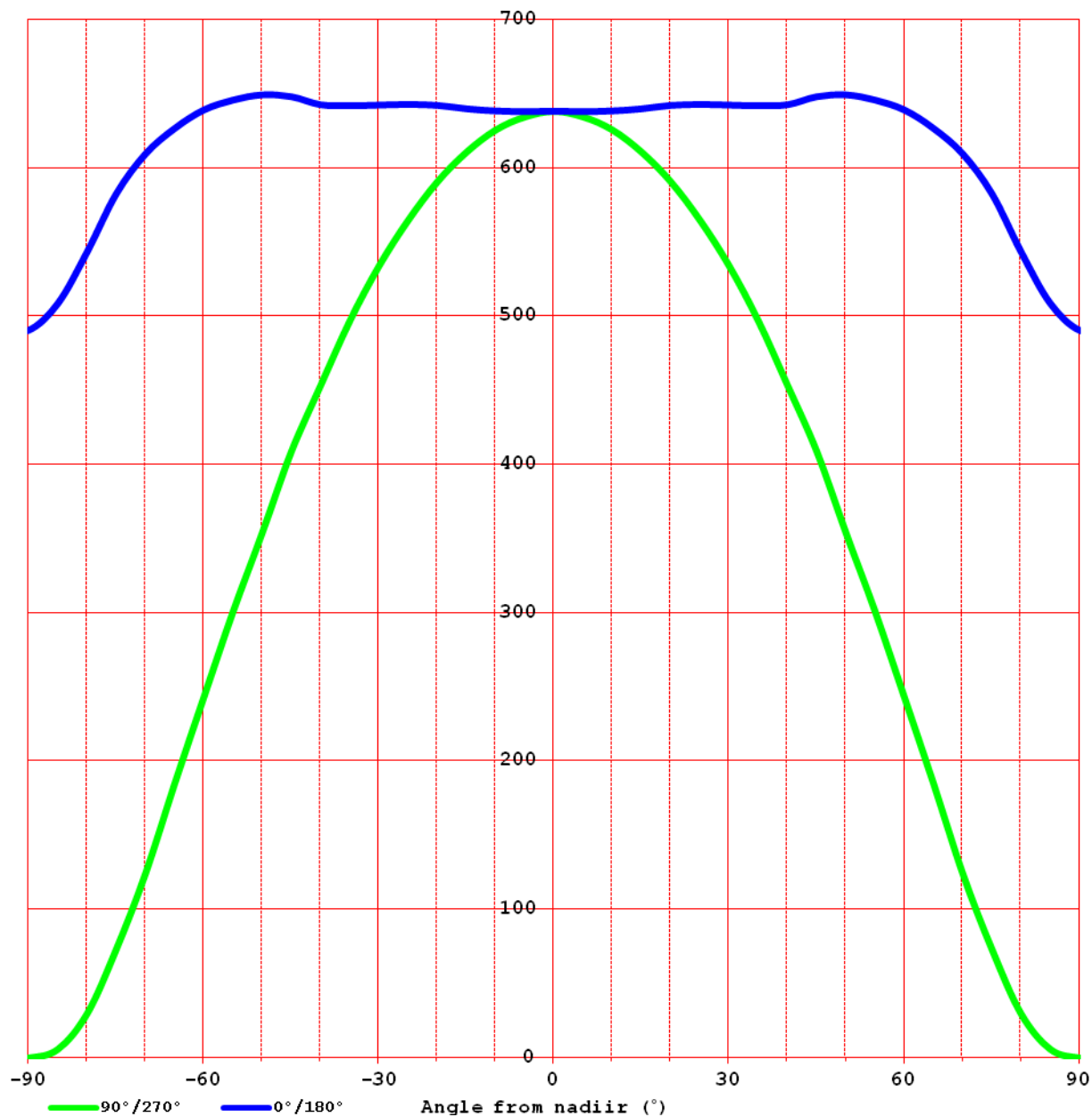
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Average Principal Axes Luminous Intensities (cd)



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Average Luminous Intensities (cd/Klm)

Angle	Transverse plane	Axial plane
0°	122.70	122.70
5°	122.67	121.98
10°	122.75	120.30
15°	123.03	117.42
20°	123.47	113.58
25°	123.59	108.58
30°	123.51	102.66
35°	123.43	95.54
40°	123.55	87.18
45°	124.59	78.62
50°	124.83	68.05
55°	124.15	57.85
60°	122.88	46.77
65°	120.48	35.57
70°	117.17	23.88
75°	112.01	14.08
80°	104.47	5.72
85°	97.79	1.12
90°	94.31	0.00
95°	94.39	0.00
100°	93.32	0.00
105°	85.72	0.00
110°	68.16	0.00
115°	54.98	0.00
120°	41.72	0.00
125°	27.62	0.00
130°	15.35	0.00
135°	4.36	0.00
140°	0.60	0.00
145°	0.48	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°	638.06	638.06
5°	637.86	634.31
10°	638.29	625.58
15°	639.75	610.60
20°	642.03	590.63
25°	642.66	564.62
30°	642.25	533.83
35°	641.84	496.80
40°	642.46	453.32
45°	647.87	408.80
50°	649.12	353.88
55°	645.59	300.83
60°	638.95	243.20
65°	626.50	184.95
70°	609.26	124.20
75°	582.47	73.23
80°	543.22	29.75
85°	508.51	5.83
90°	490.43	0.00
95°	490.84	0.00
100°	485.28	0.00
105°	445.72	0.00
110°	354.45	0.00
115°	285.92	0.00
120°	216.97	0.00
125°	143.61	0.00
130°	79.83	0.00
135°	22.66	0.00
140°	3.11	0.00
145°	2.49	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	0.14
	Down	0.56
	Total	0.69

Spacing to Height Ratios	SHR NOM	1.75
	SHR MAX	1.86
	SHR MAX TRANS	2.51

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	.38	.43	.46	.51	.55	.57	.61	.63	
	.30		N/A	.32	.37	.41	.46	.50	.53	.57	.60	
	.10		N/A	.28	.33	.36	.42	.46	.49	.54	.57	
.50	.50	.20	N/A	.35	.39	.42	.47	.50	.52	.55	.58	
	.30		N/A	.30	.34	.38	.43	.46	.49	.52	.55	
	.10		N/A	.26	.31	.34	.39	.43	.46	.50	.52	
.30	.50	.20	N/A	.32	.36	.39	.43	.46	.48	.51	.52	
	.30		N/A	.28	.32	.35	.39	.42	.45	.48	.50	
	.10		N/A	.25	.29	.32	.36	.40	.42	.46	.48	
.00	.00	.00	N/A	.22	.25	.28	.32	.35	.37	.40	.42	
BZ Class			N/A	6	6	6	6	6	6	6	6	

CIE Flux code 32 / 60 / 83 / 80 / 69

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	0.40	0.46	0.54	0.60	0.64	0.69	0.72	0.79	0.81			
CIE class	8	/	8	/	8	/	8	/	8	/	8	/	9	/	-

Flux Fraction Ratio 0.25
DIN Class 0.69 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 lumen output 5,200 lm
Lamp quantity 1

Angle Aspect Factors

	Parallel plane	Perpendicular plane
0°	0.000	0.000
5°	0.087	0.004
10°	0.172	0.015
15°	0.255	0.033
20°	0.333	0.058
25°	0.406	0.088
30°	0.473	0.123
35°	0.532	0.161
40°	0.584	0.200
45°	0.627	0.240
50°	0.662	0.279
55°	0.690	0.314
60°	0.710	0.345
65°	0.723	0.371
70°	0.731	0.391
75°	0.735	0.404
80°	0.737	0.411
85°	0.737	0.413
90°	0.737	0.413

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Lamp description

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Lamp lumen output

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Lamp quantity

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Zonal Flux Calculations

Angles	Individual	Cumulative
0° - 5°	0.4%	0.4%
5° - 10°	1.3%	1.7%
10° - 15°	2.1%	3.8%
15° - 20°	2.9%	6.6%
20° - 25°	3.6%	10.2%
25° - 30°	4.2%	14.4%
30° - 35°	4.8%	19.2%
35° - 40°	5.2%	24.4%
40° - 45°	5.6%	30.0%
45° - 50°	5.9%	35.9%
50° - 55°	6.1%	42.0%
55° - 60°	6.2%	48.2%
60° - 65°	6.1%	54.3%
65° - 70°	6.0%	60.3%
70° - 75°	5.7%	66.0%
75° - 80°	5.3%	71.2%
80° - 85°	4.7%	75.9%
85° - 90°	4.3%	80.3%
90° - 95°	4.2%	84.5%
95° - 100°	4.0%	88.5%
100° - 105°	3.6%	92.1%
105° - 110°	2.8%	94.9%
110° - 115°	2.1%	97.0%
115° - 120°	1.4%	98.4%
120° - 125°	0.9%	99.3%
125° - 130°	0.5%	99.8%
130° - 135°	0.2%	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°	5615	5433	5025	5315	5025	5433	5615
50°	5817	5616	4965	5061	4965	5616	5817
55°	6037	5805	4935	4821	4935	5805	6037
60°	6296	6012	4985	4471	4985	6012	6296
65°	6576	6263	5111	4023	5111	6263	6576
70°	6899	6573	5175	3338	5175	6573	6899
75°	7218	6899	5291	2601	5291	6899	7218
80°	7498	7180	5324	1575	5324	7180	7498
85°	7988	7592	5393	614	5393	7592	7988
	180.0°	210.0°	240.0°	270.0°	300.0°	330.0°	0.0°
45°	5615	5433	5025	5315	5025	5433	5615
50°	5817	5616	4965	5061	4965	5616	5817
55°	6037	5805	4935	4821	4935	5805	6037
60°	6296	6012	4985	4471	4985	6012	6296
65°	6576	6263	5111	4023	5111	6263	6576
70°	6899	6573	5175	3338	5175	6573	6899
75°	7218	6899	5291	2601	5291	6899	7218
80°	7498	7180	5324	1575	5324	7180	7498
85°	7988	7592	5393	614	5393	7592	7988

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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°	5541	5344	4958	5335	5103	5500	5689
50°	5733	5514	4904	5095	5034	5691	5901
55°	5935	5694	4839	4810	5011	5888	6138
60°	6177	5862	4926	4477	5004	6123	6414
65°	6433	6143	5018	4056	5221	6375	6720
70°	6738	6415	5103	3390	5283	6676	7059
75°	7052	6719	5190	2661	5394	7037	7385
80°	7289	6983	5237	1609	5367	7305	7706
85°	7802	7411	5266	702	5503	7734	8173
	180.0°	210.0°	240.0°	270.0°	300.0°	330.0°	0.0°
45°	5689	5479	5034	5294	5004	5410	5541
50°	5901	5662	4964	5027	4958	5598	5733
55°	6138	5849	4949	4833	4942	5790	5935
60°	6414	6061	5010	4466	5001	6003	6177
65°	6720	6286	5089	3990	5114	6246	6433
70°	7059	6626	5093	3287	5219	6573	6738
75°	7385	6923	5234	2541	5347	6919	7052
80°	7706	7180	5267	1541	5426	7251	7289
85°	8173	7593	5276	526	5528	7630	7802

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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°	1080	1045	966	1022	966	1045	1080
50°	1119	1080	955	973	955	1080	1119
55°	1161	1116	949	927	949	1116	1161
60°	1211	1156	959	860	959	1156	1211
65°	1265	1204	983	774	983	1204	1265
70°	1327	1264	995	642	995	1264	1327
75°	1388	1327	1018	500	1018	1327	1388
80°	1442	1381	1024	303	1024	1381	1442
85°	1536	1460	1037	118	1037	1460	1536
	180.0°	210.0°	240.0°	270.0°	300.0°	330.0°	0.0°
45°	1080	1045	966	1022	966	1045	1080
50°	1119	1080	955	973	955	1080	1119
55°	1161	1116	949	927	949	1116	1161
60°	1211	1156	959	860	959	1156	1211
65°	1265	1204	983	774	983	1204	1265
70°	1327	1264	995	642	995	1264	1327
75°	1388	1327	1018	500	1018	1327	1388
80°	1442	1381	1024	303	1024	1381	1442
85°	1536	1460	1037	118	1037	1460	1536

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Customer

Encapsulite International Ltd.

Luminaire Range

MT70 IP68

Luminaire catalog No.

MT70 58W

Luminaire description

linear cylindrical luminaire
with clear cover

data derived from range test series

Lamp description

58W/840 F T8 Sylvania Luxline Plus

Lamp lumen output

5,200 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°	1066	1028	953	1026	981	1058	1094
50°	1102	1060	943	980	968	1094	1135
55°	1141	1095	931	925	964	1132	1180
60°	1188	1127	947	861	962	1177	1234
65°	1237	1181	965	780	1004	1226	1292
70°	1296	1234	981	652	1016	1284	1358
75°	1356	1292	998	512	1037	1353	1420
80°	1402	1343	1007	309	1032	1405	1482
85°	1500	1425	1013	135	1058	1487	1572
	180.0°	210.0°	240.0°	270.0°	300.0°	330.0°	0.0°
45°	1094	1054	968	1018	962	1040	1066
50°	1135	1089	955	967	954	1077	1102
55°	1180	1125	952	929	950	1113	1141
60°	1234	1166	963	859	962	1154	1188
65°	1292	1209	979	767	984	1201	1237
70°	1358	1274	979	632	1004	1264	1296
75°	1420	1331	1007	489	1028	1331	1356
80°	1482	1381	1013	296	1044	1394	1402
85°	1572	1460	1015	101	1063	1467	1500

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Customer Encapsulite International Ltd.
Luminaire Range MT70 IP68
Luminaire catalog No. MT70 58W
Luminaire description linear cylindrical luminaire
with clear cover
data derived from range test series
Lamp description 58W/840 F T8 Sylvania Luxline Plus
Lamp lumen output 5,200 lm
Lamp quantity 1

Maximum Non averaged Luminance Values (cd/m²)

Elevation(°)

Maximum Azimuth Angle

45°	5689	180°
50°	5901	180°
55°	6138	180°
60°	6414	180°
65°	6720	180°
70°	7059	180°
75°	7385	180°
80°	7706	180°
85°	8173	180°

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Lamp lumen output 5,200 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

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Luminaire description

linear cylindrical luminaire
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Lamp description

58W/840 F T8 Sylvania Luxline Plus

Lamp lumen output

5,200 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°

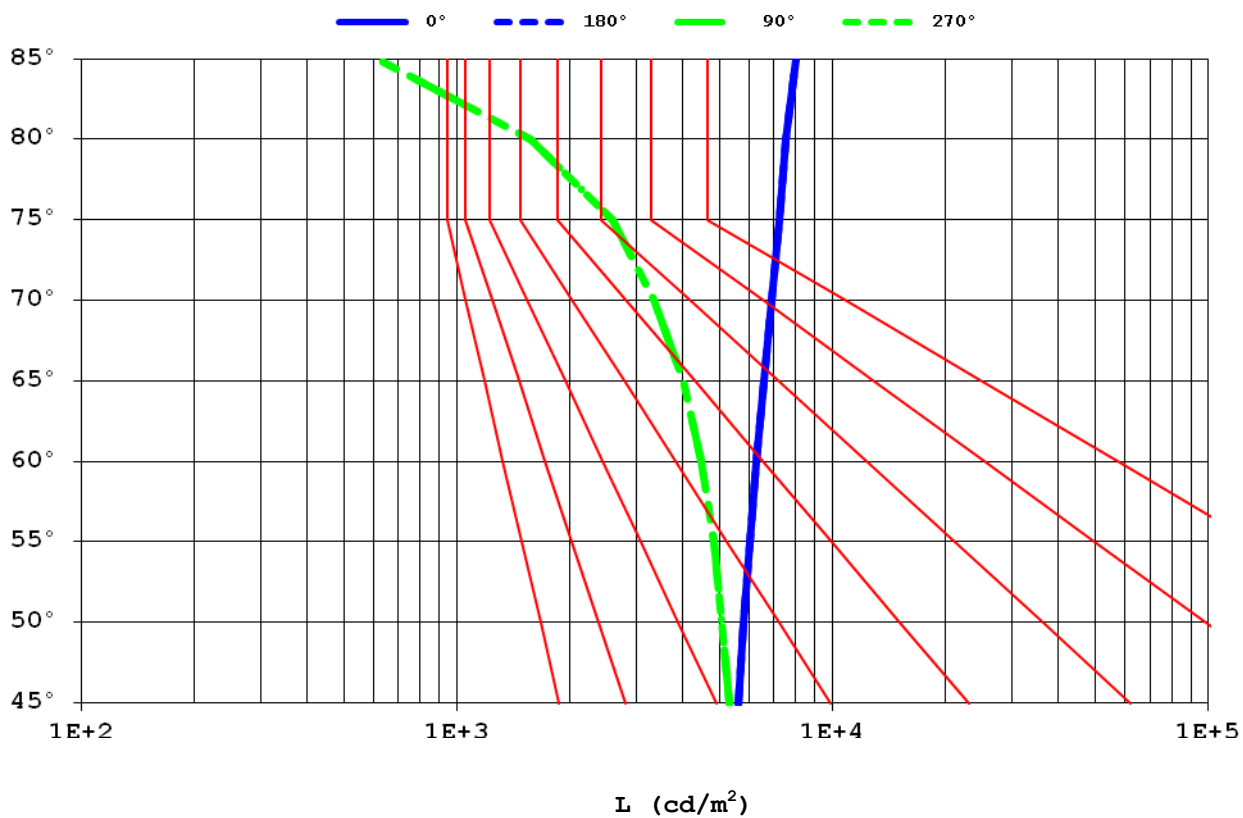
2H 2H	11.7	13.4	12.5	14.2	15.2	7.9	9.7	8.7	10.5	11.4
3H	15.2	16.8	16.0	17.6	18.6	9.8	11.4	10.6	12.3	13.3
4H	16.9	18.4	17.7	19.2	20.2	10.5	12.0	11.3	12.8	13.8
6H	18.6	20.1	19.5	20.9	21.9	10.9	12.3	11.7	13.2	14.2
8H	19.5	20.9	20.3	21.8	22.8	10.9	12.3	11.8	13.2	14.2
12H	20.4	21.8	21.2	22.6	23.7	10.9	12.3	11.8	13.2	14.2
4H 2H	12.7	14.2	13.5	15.0	16.0	10.2	11.7	11.0	12.6	13.6
3H	16.5	17.8	17.3	18.7	19.7	12.5	13.9	13.4	14.8	15.8
4H	18.5	19.7	19.3	20.6	21.6	13.5	14.7	14.4	15.6	16.7
6H	20.4	21.5	21.3	22.4	23.5	14.1	15.2	15.0	16.1	17.2
8H	21.4	22.5	22.3	23.4	24.5	14.3	15.4	15.2	16.3	17.4
12H	22.5	23.5	23.4	24.4	25.5	14.4	15.4	15.3	16.3	17.4
8H 4H	19.1	20.2	20.0	21.1	22.2	15.7	16.8	16.6	17.7	18.8
6H	21.4	22.3	22.3	23.2	24.3	16.7	17.6	17.6	18.5	19.7
8H	22.7	23.5	23.6	24.5	25.6	17.2	18.0	18.1	19.0	20.1
12H	24.0	24.7	25.0	25.7	26.8	17.5	18.2	18.4	19.2	20.3
12H 4H	19.3	20.2	20.2	21.2	22.3	16.6	17.6	17.6	18.5	19.7
6H	21.7	22.5	22.6	23.5	24.6	17.9	18.7	18.9	19.7	20.8
8H	23.1	23.8	24.0	24.7	25.9	18.5	19.2	19.5	20.2	21.3

Calculated in accordance with CIBSE Technical Memorandum No. 10 1985

Customer Encapsulite International Ltd.
Luminaire Range MT70 IP68
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Lamp lumen output 5,200 lm
Lamp quantity 1

CIE Glare Limiting (Soellnor) Diagram

Glare Quality Rating Class		Service values of illuminance							
		a	b	c	d	e	f	g	h
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



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Customer	Encapsulite International Ltd.
Luminaire Range	MT70 IP68
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Luminaire description	linear cylindrical luminaire with clear cover data derived from range test series
Lamp description	58W/840 F T8 Sylvania Luxline Plus
Lamp lumen output	5,200 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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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 = 5200 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	0.8	1.2	1.6	2.1	3.3	4.1	8.2	12.3	20.5