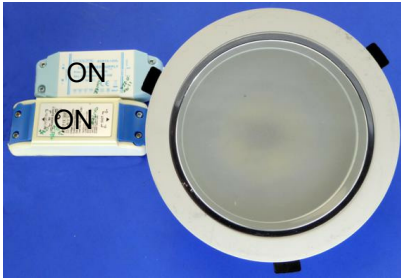
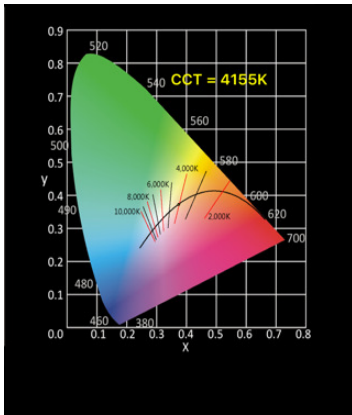


Report of Photometry & Chromaticity for Morgan Hope Industries Ltd. SAPPHIRE 20W LEDLITE LED DOWNLIGHTER



A. Product Description

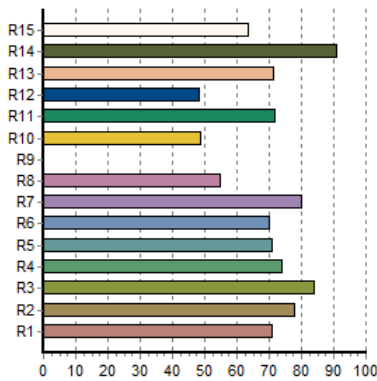
Product Name sapphire 20w ledlite
 Date 01-07-2016
 Manufacturer morganhope
 Tester lightlab photometrics Reviewer KB
 Temperature 25degC Re. Humidity(%) 50
 Spectrum Range : 380 ~ 780 nm. Wavelength Step : 1 nm.



CIE1931 Chromaticity Diagram

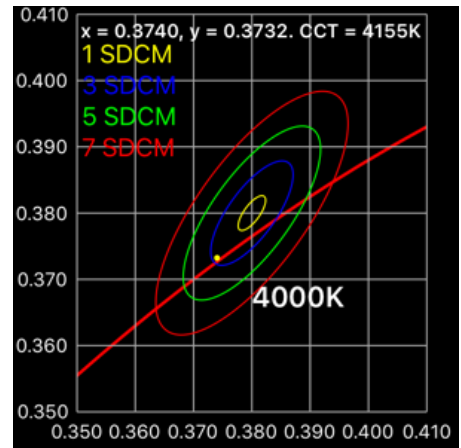
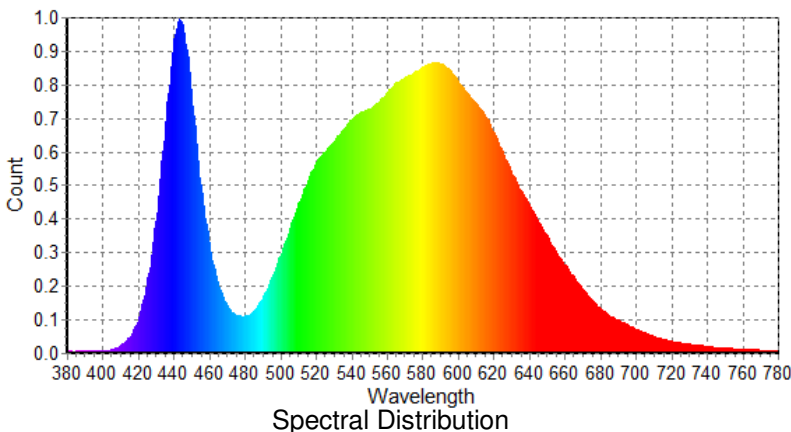
C. Photometry and Chromaticity

CIE_x	0.3740	Δv	0.0003
CIE_y	0.3732	Ld(nm)	578.3
CIE_u'	0.2223	Purity(%)	24.0
CIE_v'	0.4991	FWHM(nm)	24.1
CCT(K)	4155	SP ratio	1.56
Luminaire lumens	1700	PPFD(umol/sec m ²)	
Lp(nm)	443.0		31.1
TLCI(Qa)	44.73	GAI	74.7



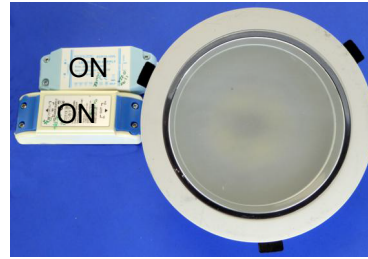
CRI(Ra)	73	Re(thru R1~R15)	64
Qa	73		
R1	71.2	R6	70.6
R2	78.4	R7	80.3
R3	84.5	R8	55.3
R4	74.2	R9	-24.4
R5	71.4	R10	49.2
		R11	72.2
		R12	48.6
		R13	71.8
		R14	91.1
		R15	63.7

Histogram Diagram of CRI



IEC SDCM

filename : SAPHIRE-20W-LEDLITE.LDT
 meas. number : 1943
 luminaire number : SAPHIRE-20W-LEDLITE
 date / operator : 01-07-2017



default lamp type(s)

no of lamps	lamp type	luminaire lumens	input wattage
1	2 x LED MODULES	1700 lm	20.0 W

dimensions

luminaire	luminous area
diameter : 190 mm	diameter : 140 mm
height : 5 mm	height : 0 mm

coordinate system

no of planes : 7	samples / plane : 37
first c-plane : 0.0 °	first gamma-angle : 0.0 °
step angle : 15.0 °	step angle : 5.0 °
last c-plane : 90.0 °	last gamma-angle : 180.0 °

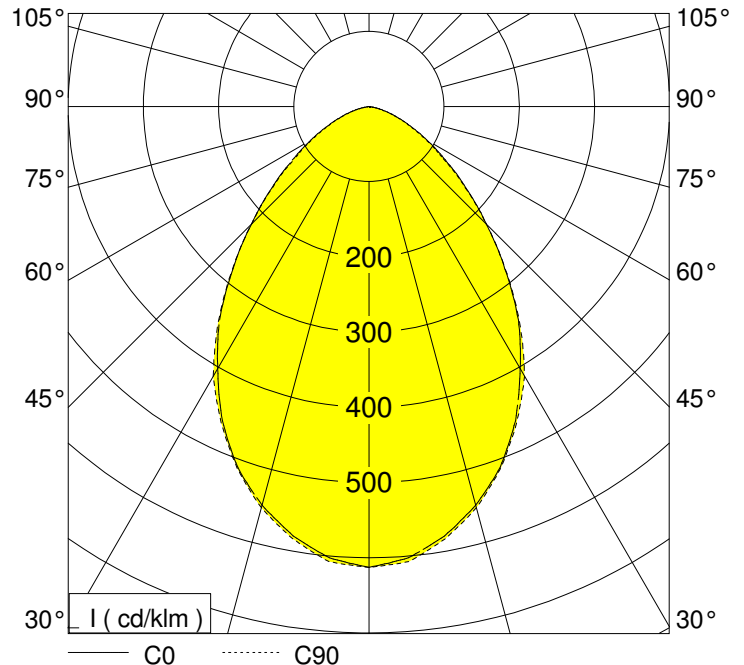
symmetrics : symmetry to C0 / C90

performance

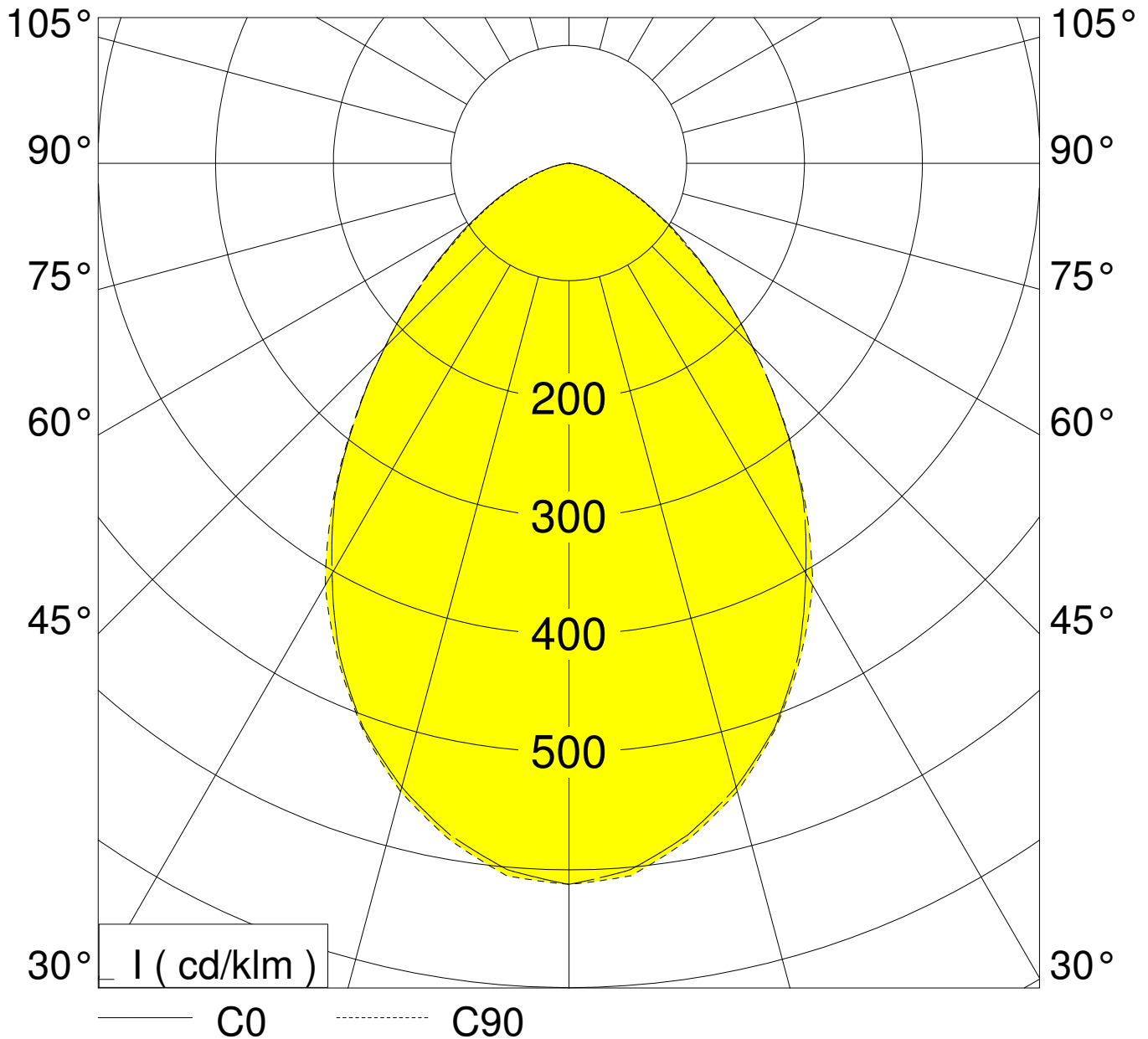
light output ratio : 100.0 %
DFF : 100.0 %
UFF : 0.0 %

classification

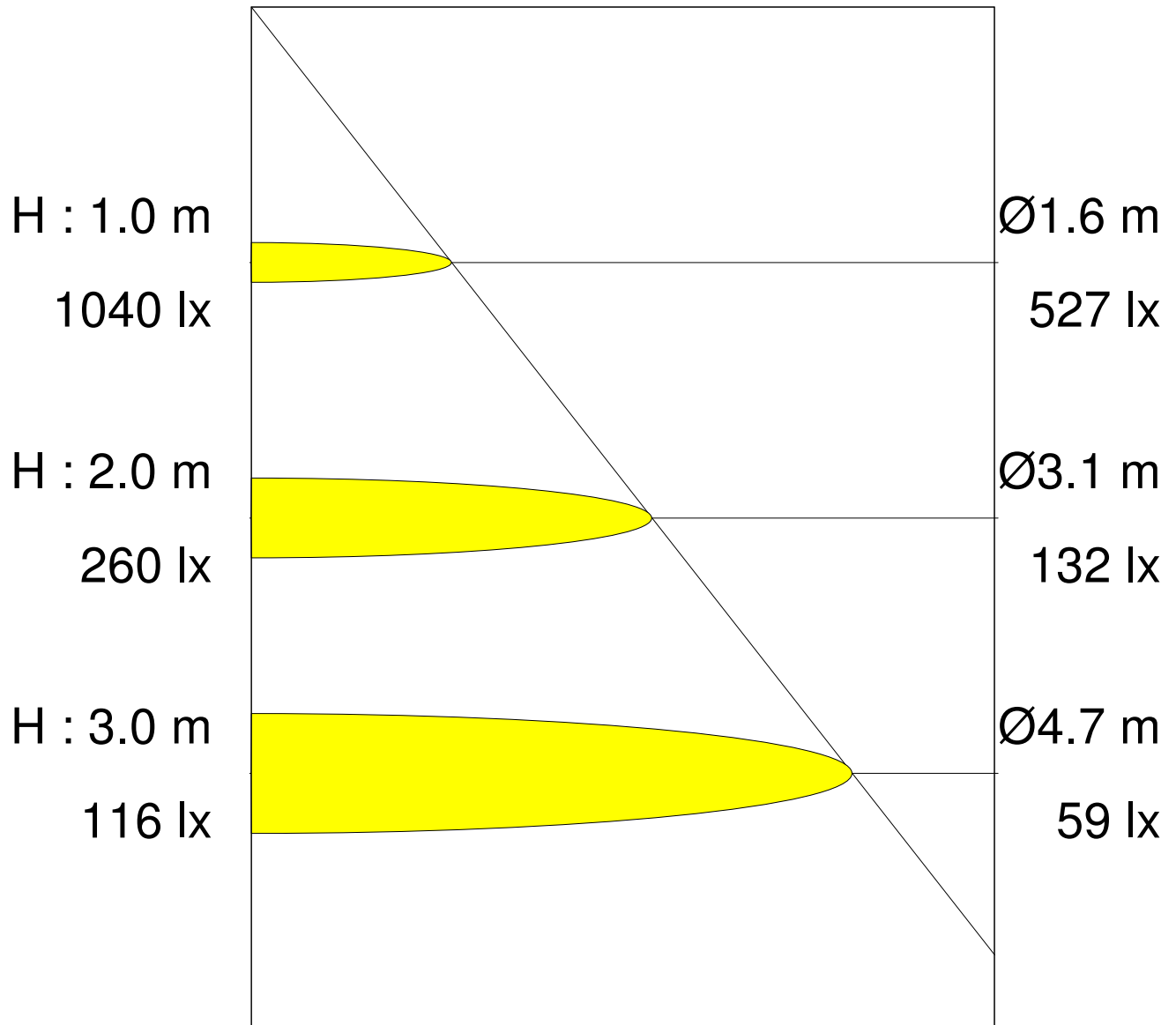
LiTG / DIN : A50
UTE : 1.00C
CIE : 66 92 99 100 100
BZ : 2 2 2 2 2 2 2 2 2 2
Ambient Temperature : 25 degC
Input Voltage : 240 V
Circuit Watts : 20.0W (combined drivers)
Amps (running) : 0.100A
V.A. : 24.10VA
Power Factor : 0.83
CCT : 4155K (measured): 4000K (declared)
CRI (Ra) : 73
Luminaire Lumens : 1700 LLm
Output Current DC : 460mA + 220mA
Output Voltage DC : 30.6V : 11.9V
Output Power : 14.08W + 2.62W
Luminaire Lm/circ.Watt : 85 Lm/circ.Watt
Driver Efficiency : 83% (combined)
Driver Details : ECOPACK15-12VL INNER UN-NAMED OUTER



Measurements made are in absolute units. The luminaire is treated as if it was a lamp as it is not possible to measure each LED separately - hence an LOR of 100%
 The Light output ratio in real terms would be less than 100%. If it was possible to compare real LED lumens with the total output from the luminaire we could obtain an actual LOR
 This also means that the total lumens emitted from the LED's would be greater than the Luminaire Lumens measured. In reality the LED lumens would approximate to this value divided by the actual Light Output.



Half peak divergence : 76.2°



SAPPHIRE 20W LEDLITE LED DOWNLIGHTER

intensity table

	C 0.0	C 15.0	C 30.0	C 45.0	C 60.0	C 75.0	C 90.0
0.0°	611.90	611.90	611.90	611.90	611.90	611.90	611.90
5.0°	601.60	602.10	602.60	603.60	604.60	605.70	606.80
10.0°	578.90	579.90	580.90	582.40	584.00	583.40	582.90
15.0°	548.10	547.50	546.90	548.90	550.90	551.40	551.90
20.0°	509.90	507.20	504.60	509.10	513.70	512.60	511.40
25.0°	460.50	457.80	455.10	459.10	463.10	463.50	463.90
30.0°	401.80	403.10	404.40	403.80	403.10	408.30	413.50
35.0°	346.20	343.20	340.20	343.60	347.00	347.80	348.70
40.0°	280.90	277.80	274.70	277.60	280.40	281.30	282.20
45.0°	220.80	218.40	216.10	217.30	218.50	219.40	220.40
50.0°	168.40	166.70	165.00	166.20	167.40	167.30	167.10
55.0°	124.10	122.20	120.30	121.70	123.00	121.90	120.70
60.0°	88.70	87.70	86.80	87.40	88.10	87.20	86.30
65.0°	60.00	59.20	58.30	58.90	59.60	58.70	57.90
70.0°	37.60	37.20	36.80	37.10	37.50	36.70	36.00
75.0°	20.60	20.20	19.80	20.30	20.70	19.90	19.00
80.0°	8.60	8.20	7.70	8.40	9.00	7.90	6.80
85.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	cd / klm						

glare rating according to UGR											
ρ-ceiling	70	70	50	50	30	70	70	50	50	30	
ρ-walls	50	30	50	30	30	50	30	50	30	30	
ρ-workplane	20	20	20	20	20	20	20	20	20	20	
room dimensions X Y		viewed crosswise					viewed endwise				
2H	2H	23.0	24.3	23.3	24.5	24.6	23.0	24.3	23.3	24.5	24.7
	3H	22.9	23.8	23.1	24.0	24.2	22.9	23.8	23.1	24.0	24.2
	4H	23.1	24.0	23.4	24.2	24.4	23.1	24.0	23.4	24.2	24.4
	6H	23.2	24.1	23.5	24.3	24.5	23.2	24.1	23.5	24.3	24.5
	8H	23.3	24.1	23.6	24.4	24.6	23.2	24.1	23.5	24.3	24.6
	12H	23.3	24.2	23.6	24.4	24.6	23.3	24.1	23.6	24.4	24.6
4H	2H	22.7	23.6	23.0	23.8	24.0	22.8	23.7	23.0	23.9	24.0
	3H	23.6	24.5	23.9	24.7	24.9	23.6	24.5	23.9	24.7	24.9
	4H	23.9	24.8	24.3	25.0	25.3	23.9	24.8	24.3	25.0	25.3
	6H	23.9	24.6	24.2	24.9	25.2	23.9	24.5	24.2	24.8	25.2
	8H	23.9	24.6	24.3	24.9	25.2	23.9	24.5	24.3	24.9	25.2
	12H	24.1	24.7	24.5	25.1	25.5	24.1	24.7	24.5	25.1	25.5
8H	4H	23.9	24.5	24.3	24.9	25.2	23.9	24.5	24.3	24.9	25.2
	6H	24.3	24.9	24.7	25.3	25.7	24.3	24.9	24.7	25.3	25.7
	8H	24.4	25.0	24.9	25.4	25.9	24.4	24.9	24.9	25.4	25.9
	12H	24.3	24.8	24.8	25.3	25.8	24.3	24.8	24.8	25.2	25.7
12H	4H	24.1	24.7	24.5	25.1	25.5	24.0	24.7	24.5	25.1	25.5
	6H	24.4	24.9	24.9	25.4	25.9	24.4	24.9	24.8	25.4	25.9
	8H	24.3	24.8	24.8	25.3	25.8	24.3	24.8	24.8	25.2	25.8
variation of observer position											
S =	1.0H	+0.4/		-0.7		+0.4/		-0.7			
	1.5H	+0.8/		-1.5		+0.8/		-1.6			
	2.0H	+1.9/		-2.4		+1.9/		-2.5			
standard-table	BK02					BK02					
correction for luminaire	6.2					6.2					
correct glare indices for a total flux of 1700lm											

class		glare rating for service value of illuminance (lx)									
A	A	1000	750	500	--	≤ 300					
1	B	2000	1500	1000	750	500	≤ 300				
2	D					2000	1000	500	≤ 300		
3	E						2000	1000	500	≤ 300	

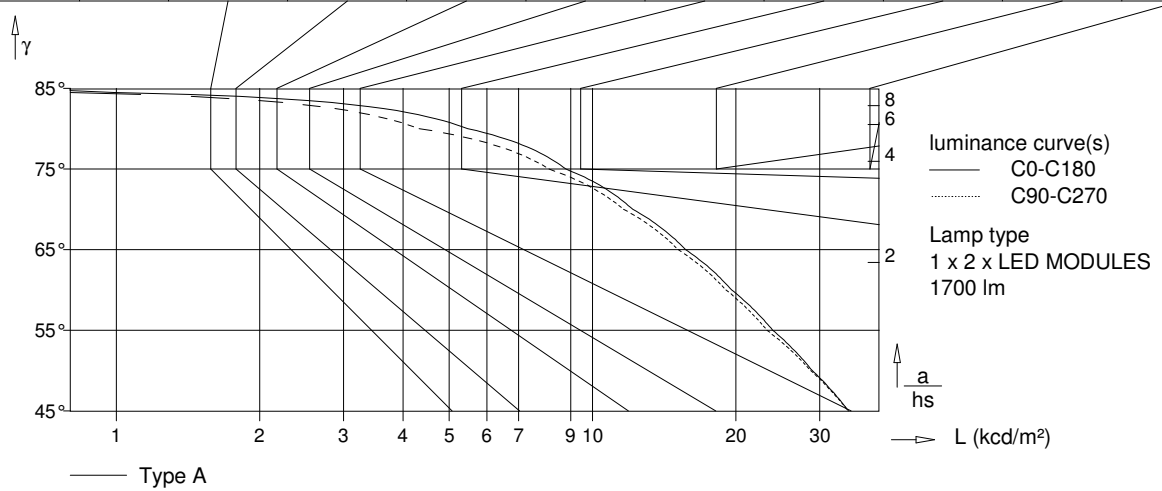


Tabelle der berechneten Leuchtdichten

gamma	C 0	C 90	C 180	C 270
45°	34484.0	34421.5	34484.0	34421.5
50°	28931.9	28708.6	28931.9	28708.6
55°	23893.7	23239.1	23893.7	23239.1
60°	19591.0	19060.9	19591.0	19060.9
65°	15678.6	15129.8	15678.6	15129.8
70°	12140.6	11624.0	12140.6	11624.0
75°	8789.7	8107.0	8789.7	8107.0
80°	5469.3	4324.6	5469.3	4324.6
85°	0.0	0.0	0.0	0.0

alle Werte in cd/m²

utilization factors / TM5											
reflection			room index								
C	W	F	0.75	1.0	1.25	1.5	2.0	2.5	3.0	4.0	5.0
70	50	20	70	79	85	90	95	99	102	105	107
70	30	20	64	73	80	84	91	95	98	102	105
70	10	20	59	69	75	80	87	92	95	99	102
50	50	20	69	77	83	87	92	96	98	101	103
50	30	20	63	72	78	83	88	92	95	99	101
50	10	20	59	68	74	79	85	89	92	97	99
30	50	20	67	76	81	85	90	93	95	98	99
30	30	20	62	71	77	81	86	90	92	96	98
30	10	20	59	67	73	78	84	88	90	94	96
0	0	0	57	65	71	75	80	84	86	90	92
BZ-class			2	2	2	2	2	2	2	2	2
SHRnom : 1.25						SHRmax : 1.295					

