

filename : NHE13-LED-850.LDT
 meas. number : 1483/C1
 luminaire number : NHE13/LED/850
 date / operator : 01-06-2015



default lamp type(s)

no of lamps	lamp type	luminaire lumens	input wattage
1	350mA LED 5000K MODULE	830 lm	13 W

dimensions

luminaire	luminous area
diameter : 170 mm	diameter : 120 mm
height : 40 mm	height : 0 mm

coordinate system

no of planes : 1	samples / plane : 37
first c-plane : 0.0 °	first gamma-angle : 0.0 °
step angle : 0.0 °	step angle : 5.0 °
last c-plane : 0.0 °	last gamma-angle : 180.0 °
symmetrics : rotational symmetry	

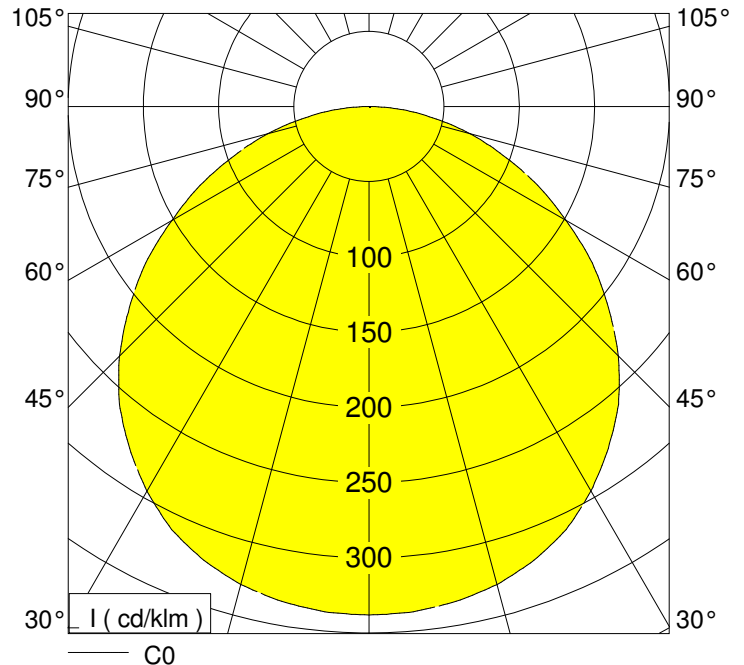
performance

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

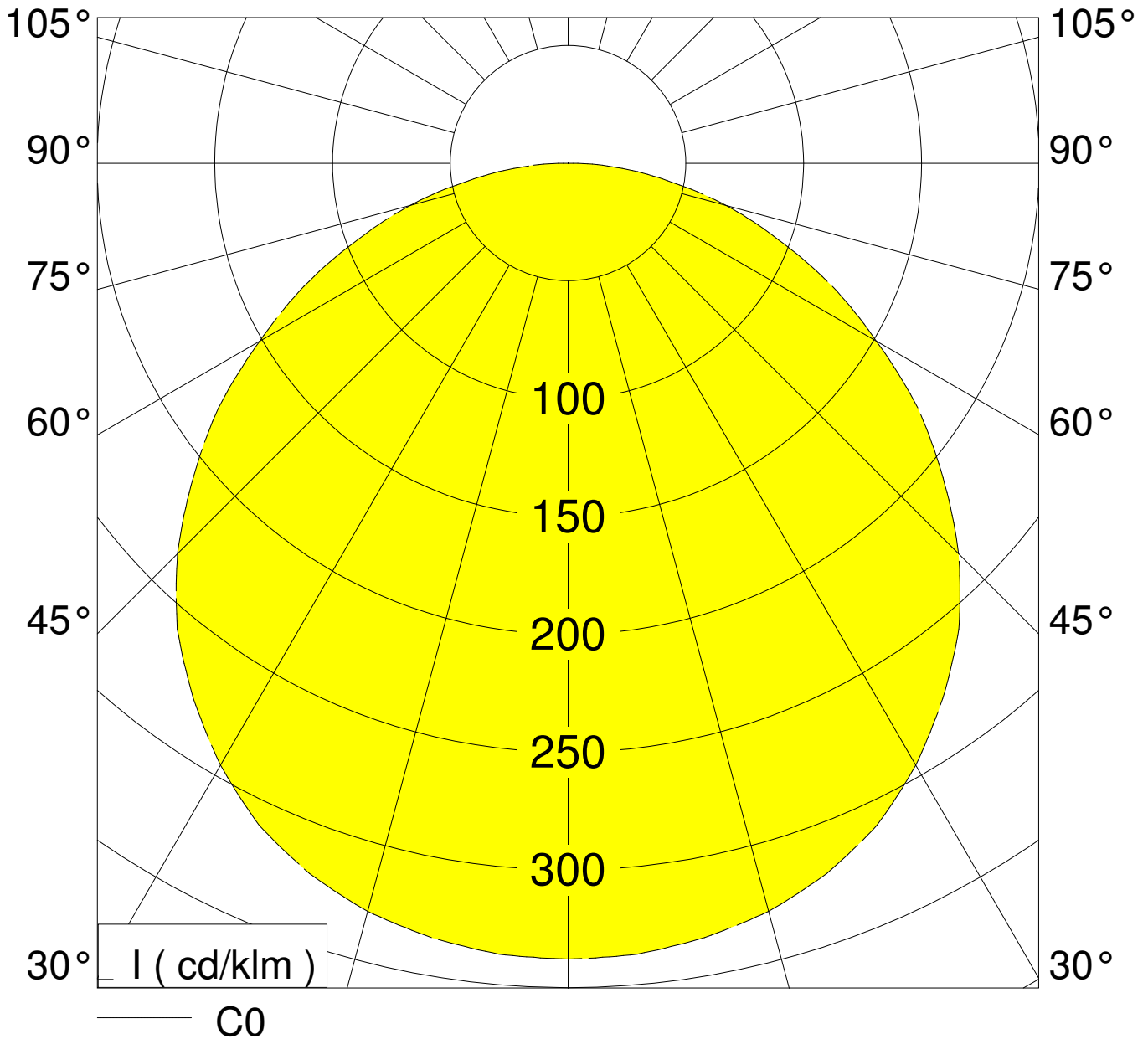
classification

LiTG / DIN : A40
UTE : 1.00D1.00E
CIE : 47 78 95 100 100
BZ : 5 5 5 5 5 5 5 5

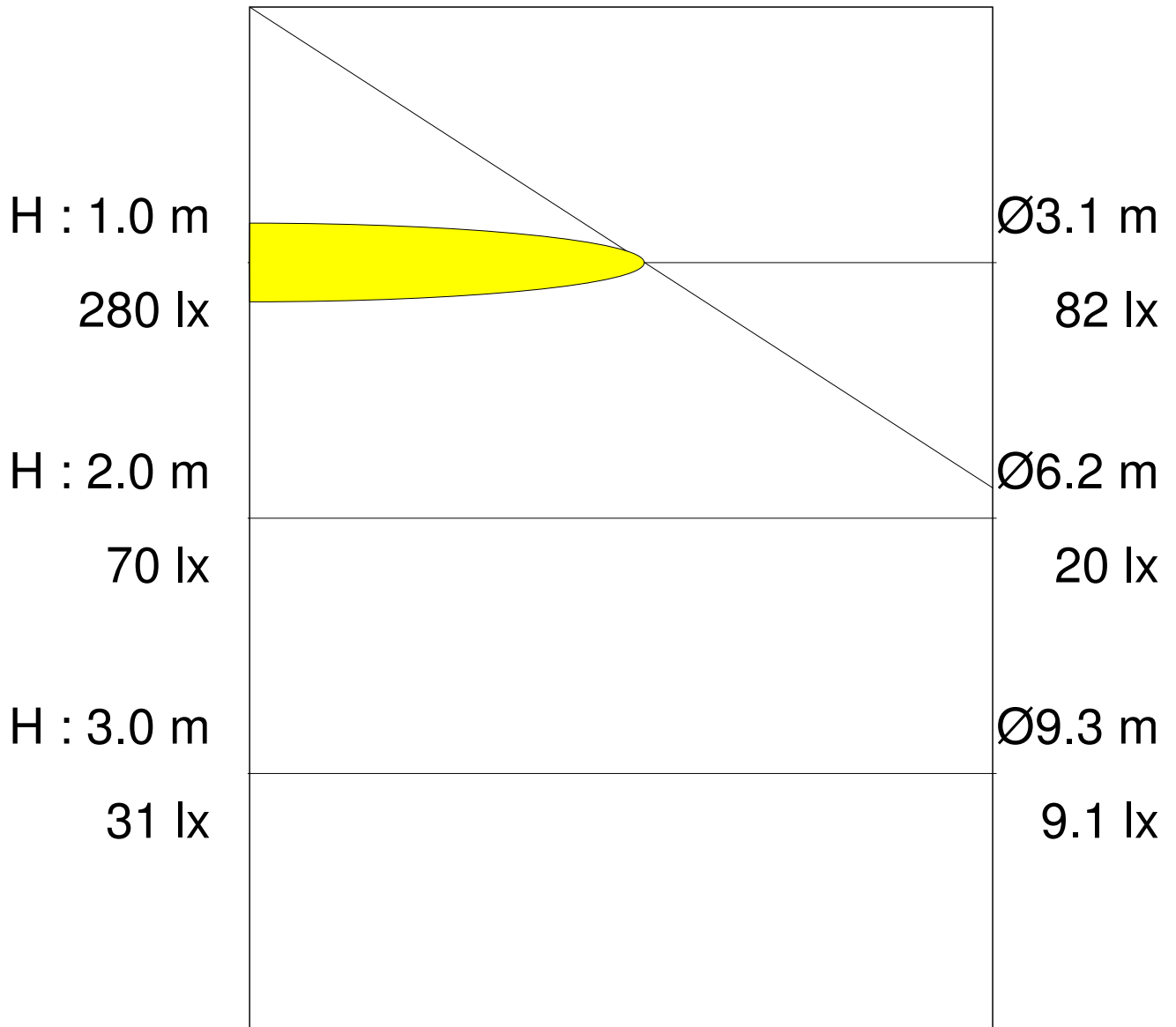
Ambient Temperature : 25 degC
Input Voltage : 240 V
Circuit Watts : 13.3W
Amps (running) : 0.057 A
V.A. : 13.71 VA
Power Factor : 0.97
CCT : 5000K (declared)
Luminaire Lumens : 830 LM
Output current DC : 350 mA
Output Voltage DC : 30.7 V
Output Power : 10.75 W
Luminaire Lm/CircWatt : 62.41 Lum Lm/circW
Driver Efficiency : 81%
Driver Details : OPTOTRONIC OTe
13/220-240-350PC



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 : 114.2°



	C 0.0
0.0°	337.60
5.0°	336.80
10.0°	333.60
15.0°	328.60
20.0°	320.70
25.0°	310.00
30.0°	294.90
35.0°	277.10
40.0°	257.90
45.0°	234.30
50.0°	207.60
55.0°	181.10
60.0°	151.00
65.0°	123.70
70.0°	94.90
75.0°	69.60
80.0°	42.80
85.0°	20.90
90.0°	0.00
95.0°	0.00
100.0°	0.00
105.0°	0.00
110.0°	0.00
115.0°	0.00
120.0°	0.00
125.0°	0.00
130.0°	0.00
135.0°	0.00
140.0°	0.00
145.0°	0.00
150.0°	0.00
155.0°	0.00
160.0°	0.00
165.0°	0.00
170.0°	0.00
175.0°	0.00
180.0°	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	23.8	25.3	24.0	25.5	25.7	23.8	25.3	24.0	25.5	25.7	
	3H	24.7	25.9	25.0	26.0	26.2	24.7	25.9	25.0	26.0	26.2	
	4H	25.4	26.6	25.7	26.8	27.0	25.4	26.6	25.7	26.8	27.0	
	6H	26.0	27.0	26.3	27.3	27.5	26.0	27.0	26.3	27.3	27.5	
	8H	26.2	27.3	26.5	27.5	27.7	26.2	27.3	26.5	27.5	27.7	
	12H	26.4	27.5	26.7	27.7	28.0	26.4	27.5	26.7	27.7	28.0	
4H	2H	23.9	25.0	24.2	25.2	25.4	23.9	25.0	24.2	25.2	25.4	
	3H	25.8	26.8	26.1	27.1	27.3	25.8	26.8	26.1	27.1	27.3	
	4H	26.7	27.7	27.1	28.0	28.3	26.7	27.7	27.1	28.0	28.3	
	6H	27.2	28.0	27.5	28.3	28.6	27.2	28.0	27.5	28.3	28.6	
	8H	27.5	28.2	27.8	28.6	28.9	27.5	28.2	27.8	28.6	28.9	
	12H	27.8	28.6	28.3	29.0	29.4	27.8	28.6	28.3	29.0	29.4	
8H	4H	26.9	27.7	27.3	28.0	28.3	26.9	27.7	27.3	28.0	28.3	
	6H	28.0	28.7	28.4	29.1	29.5	28.0	28.7	28.4	29.1	29.5	
	8H	28.4	29.1	28.9	29.6	30.0	28.4	29.1	28.9	29.6	30.0	
	12H	28.6	29.2	29.1	29.7	30.2	28.6	29.2	29.1	29.7	30.2	
12H	4H	27.1	27.9	27.5	28.2	28.6	27.1	27.9	27.5	28.2	28.6	
	6H	28.2	28.9	28.6	29.3	29.8	28.2	28.9	28.6	29.3	29.8	
	8H	28.5	29.1	29.0	29.5	30.0	28.5	29.1	29.0	29.5	30.0	
variation of observer position												
S =	1.0H	+0.1/			-0.1			+0.1/		-0.1		
	1.5H	+0.2/			-0.3			+0.2/		-0.3		
	2.0H	+0.4/			-0.5			+0.4/		-0.5		
standard-table	BK06					BK06						
correction for luminaire	11.0					11.0						
correct glare indices for a total flux of 830lm												

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	

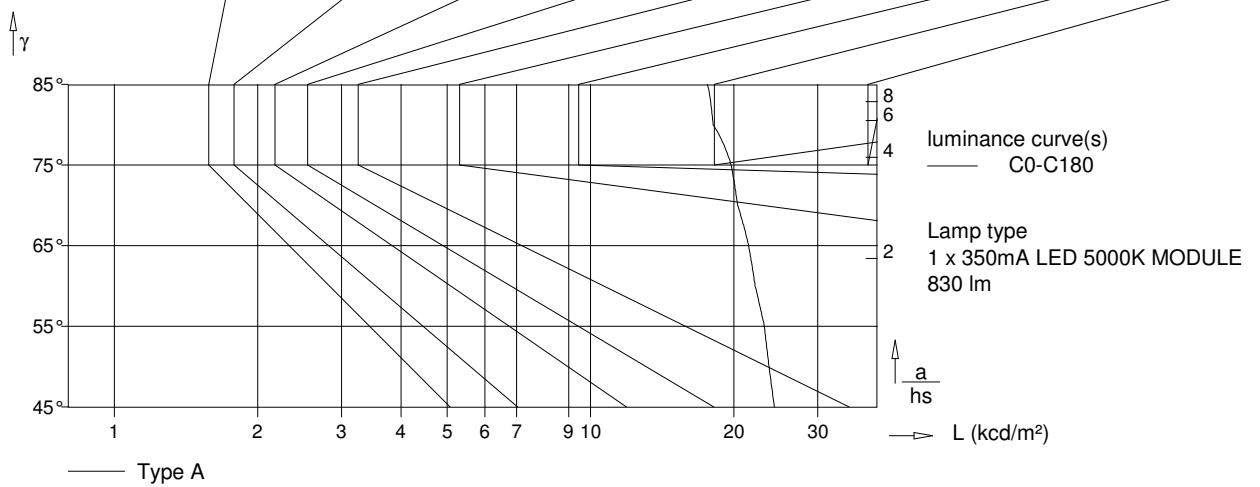
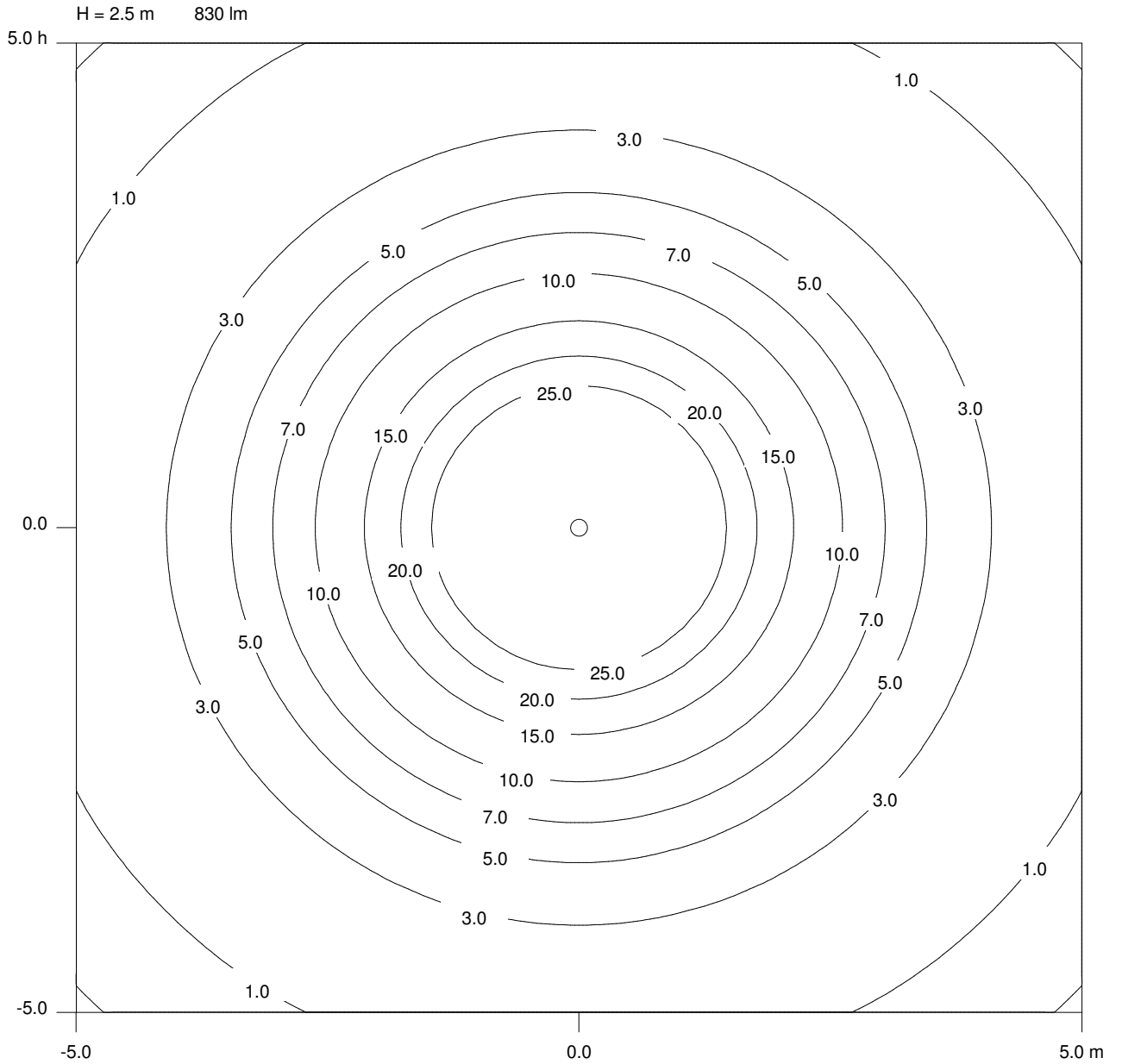


Tabelle der berechneten Leuchtdichten

gamma	C 0	C 90	C 180	C 270
45°	24317.2	24317.2	24317.2	24317.2
50°	23702.0	23702.0	23702.0	23702.0
55°	23171.4	23171.4	23171.4	23171.4
60°	22163.2	22163.2	22163.2	22163.2
65°	21480.6	21480.6	21480.6	21480.6
70°	20362.9	20362.9	20362.9	20362.9
75°	19735.1	19735.1	19735.1	19735.1
80°	18088.4	18088.4	18088.4	18088.4
85°	17598.5	17598.5	17598.5	17598.5

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	56	66	74	79	86	91	95	100	103
70	30	20	48	58	66	72	80	86	90	95	99
70	10	20	42	52	60	66	75	81	85	92	96
50	50	20	54	64	71	76	83	88	91	96	98
50	30	20	47	57	65	70	78	83	87	92	95
50	10	20	42	52	59	65	73	79	83	89	93
30	50	20	53	62	69	74	80	85	88	92	95
30	30	20	46	56	63	68	76	81	84	89	92
30	10	20	41	51	59	64	72	77	81	86	90
0	0	0	39	49	56	61	68	73	77	82	85
BZ-class			5	5	5	5	5	5	5	5	5
SHRnom : 1.25						SHRmax : 1.489					

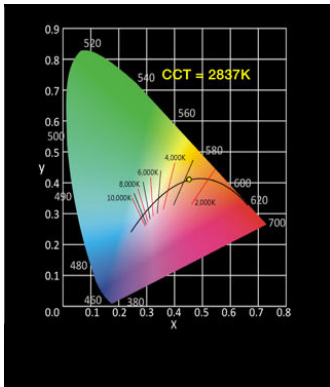


Report of Photometry & Chromaticity of NVC Lighting Ltd. HORTEN NHE18/LED/830



A. Product Description

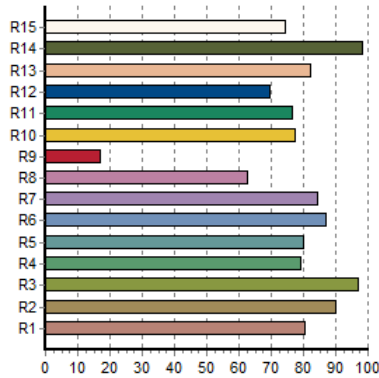
Product Name nhe18 led 830 500ma Sample Number 1455
 Date 19-05-2015
 Manufacturer NVC Lighting Ltd.
 Tester LightLab Photometrics Ltd. Reviewer KB
 Temperature 25degC Re. Humidity(%) 57
 Spectrum Range : 380 ~ 780 nm. Wavelength Step : 1 nm.



CIE1931 Chromaticity Diagram

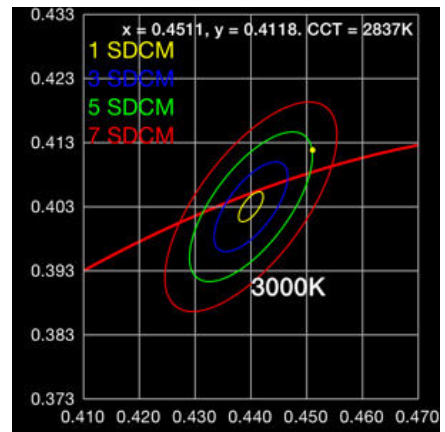
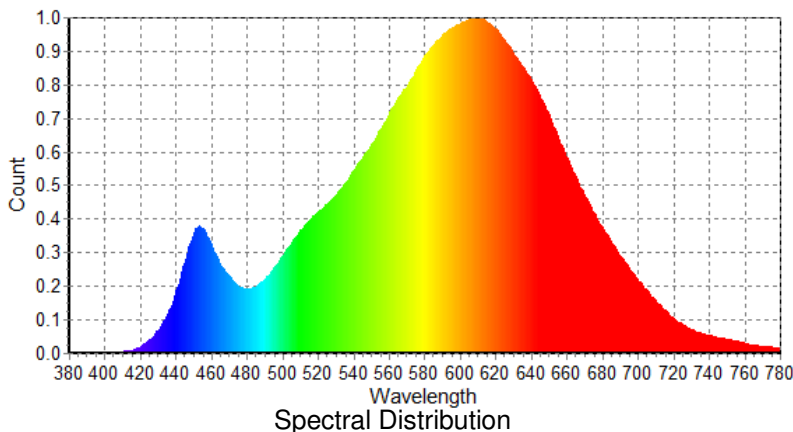
C. Photometry and Chromaticity

CIE_x	0.4511	Duv	0.0013
CIE_y	0.4118	d(nm)	583.1
CIE_u'	0.2563	Purity(%)	59.0
CIE_v'	0.5265	FWHM(nm)	134.0
CCT(K)	2837	SP ratio	1.26
Luminaire Lumens	1045	PPFD(umol/sec m^2)	
p(nm)	610.0		16.44



CRI(Ra)	83	Re(thru R1~R15)	77
Qa	84		
R1	80.7	R6	87.6
R2	90.4	R7	84.9
R3	97.3	R8	62.8
R4	79.7	R9	17.3
R5	80.3	R10	77.8
		R11	77.2
		R12	70.0
		R13	82.6
		R14	98.8
		R15	74.9

Histogram Diagram of CRI



IEC SDCM

filename : NHE18-LED-830.LDT
 meas. number : 1455
 luminaire number : NHE18/LED/830
 date / operator : 11-05-2015



default lamp type(s)

no of lamps	lamp type	luminaire lumens	input wattage
1	500mA LED MODULE	1045 lm	18.4 W

dimensions

luminaire	luminous area
diameter : 240 mm	diameter : 190 mm
height : 40 mm	height : 0 mm

coordinate system

no of planes : 1	samples / plane : 37
first c-plane : 0.0 °	first gamma-angle : 0.0 °
step angle : 0.0 °	step angle : 5.0 °
last c-plane : 0.0 °	last gamma-angle : 180.0 °
symmetrics : rotational symmetry	

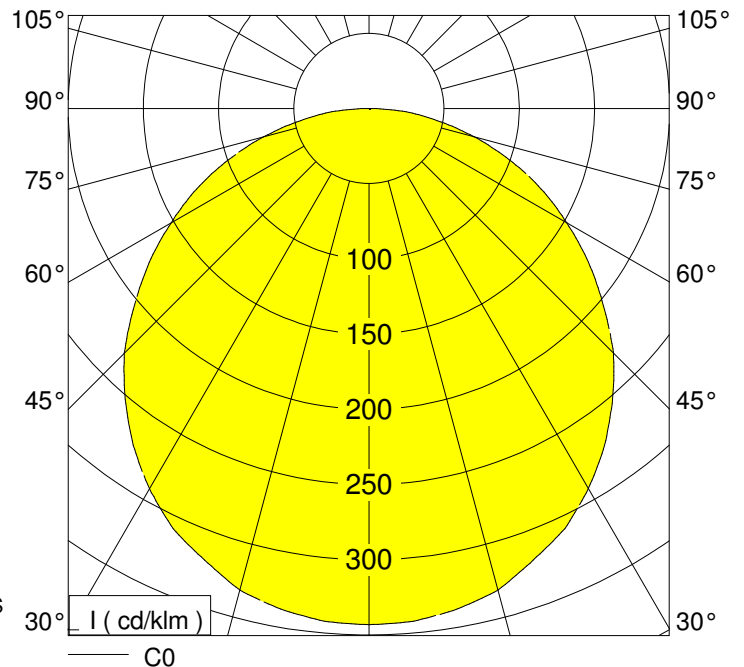
performance

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

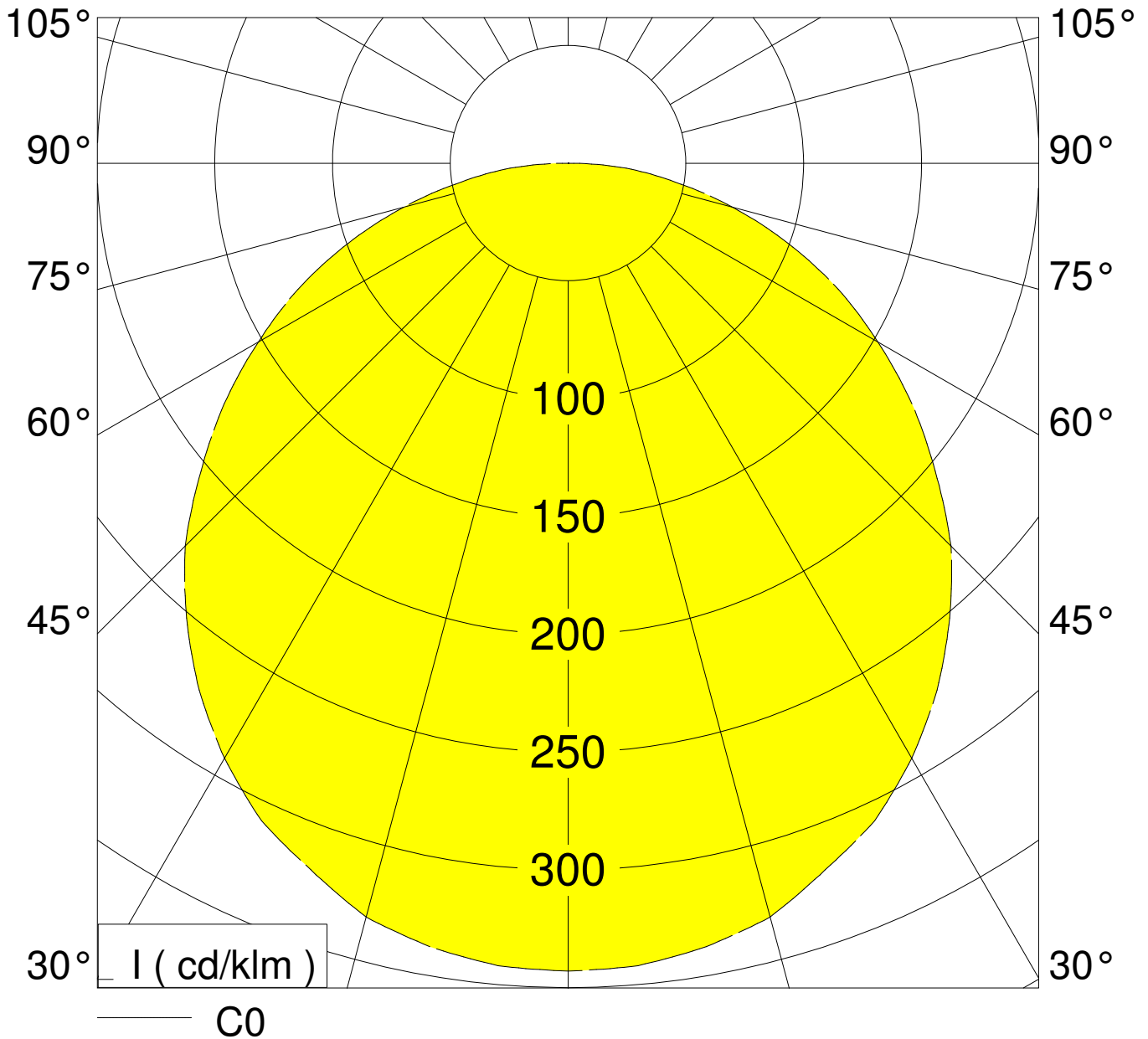
classification

LiTG / DIN : A40
UTE : 1.00E
CIE : 46 77 95 100 100
BZ : 5 5 5 5 5 5 5 5

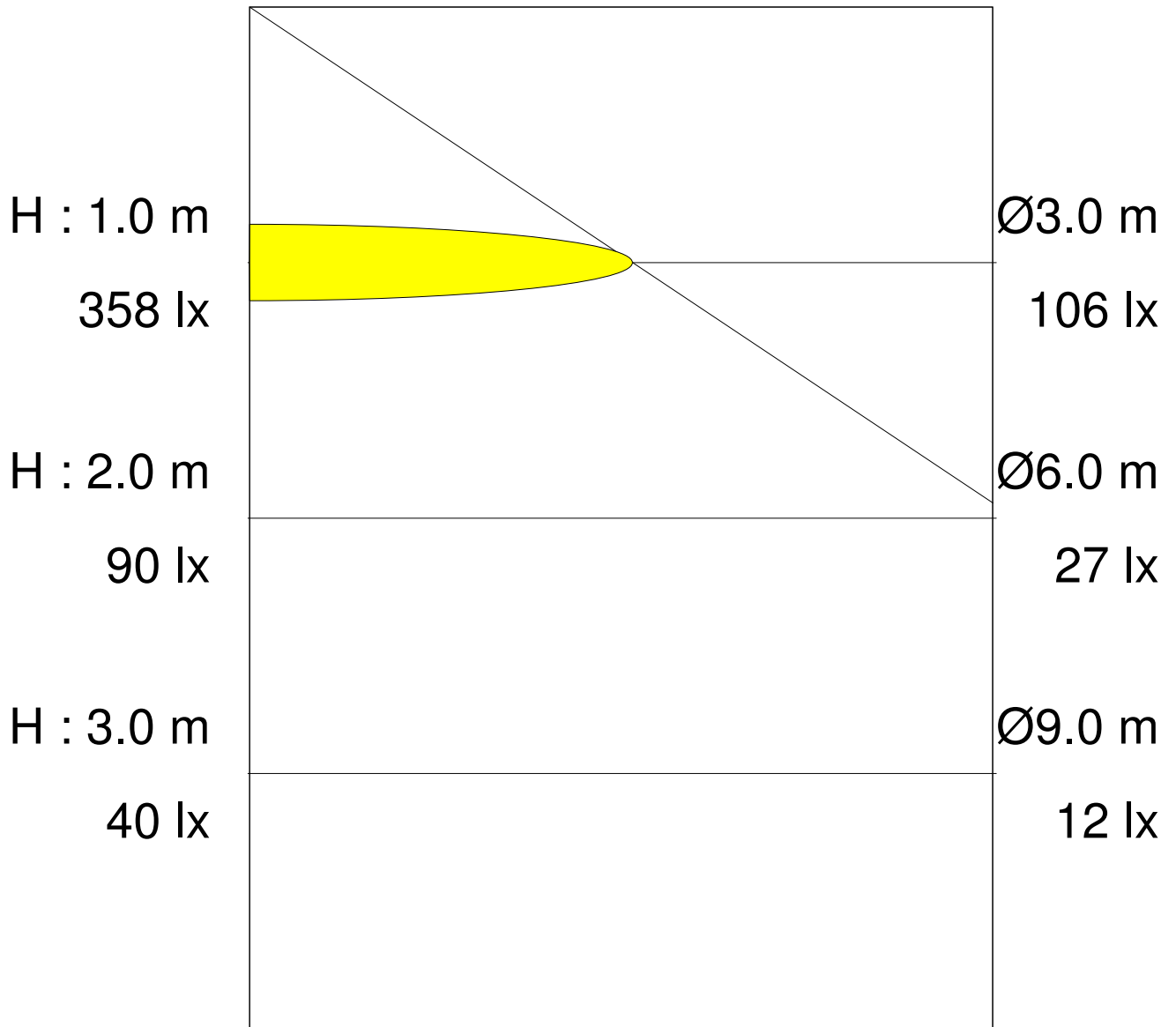
Ambient Temperature : 25 degC
Input Voltage : 240 V
Circuit Watts : 18.4 W
Amps (running) : 0.079 A
V.A. : 18.97 VA
Power Factor : 0.97
CCT : 2837K (measured): 3000K (declared)
Luminaire Lumens : 1045 Lm
Output current DC : 500 mA
Output Voltage DC : 31.0 V
Output Power : 15.50 W
Luminaire Lm/CircWatt : 56.8 Lum Lm/circW
Driver Efficiency : 84%
Driver Details : OPTOTRONIC OTe 25/220-240/700CS



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 : 112.6°



	C 0.0
0.0°	342.70
5.0°	341.70
10.0°	337.50
15.0°	331.10
20.0°	319.00
25.0°	307.80
30.0°	291.50
35.0°	272.90
40.0°	251.80
45.0°	229.70
50.0°	203.30
55.0°	178.10
60.0°	151.70
65.0°	126.40
70.0°	99.20
75.0°	72.30
80.0°	46.10
85.0°	24.80
90.0°	0.00
95.0°	0.00
100.0°	0.00
105.0°	0.00
110.0°	0.00
115.0°	0.00
120.0°	0.00
125.0°	0.00
130.0°	0.00
135.0°	0.00
140.0°	0.00
145.0°	0.00
150.0°	0.00
155.0°	0.00
160.0°	0.00
165.0°	0.00
170.0°	0.00
175.0°	0.00
180.0°	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	21.3	22.9	21.6	23.1	23.3	21.3	22.9	21.6	23.1	23.3	
	3H	22.4	23.6	22.7	23.7	23.9	22.4	23.6	22.7	23.7	23.9	
	4H	23.2	24.3	23.4	24.5	24.7	23.2	24.3	23.4	24.5	24.7	
	6H	23.7	24.8	24.0	25.0	25.3	23.7	24.8	24.0	25.0	25.3	
	8H	24.0	25.1	24.3	25.3	25.6	24.0	25.1	24.3	25.3	25.6	
	12H	24.3	25.3	24.6	25.6	25.8	24.3	25.3	24.6	25.6	25.8	
4H	2H	21.5	22.6	21.8	22.8	23.0	21.5	22.6	21.8	22.8	23.0	
	3H	23.5	24.5	23.8	24.8	25.0	23.5	24.5	23.8	24.8	25.0	
	4H	24.5	25.5	24.8	25.8	26.1	24.5	25.5	24.8	25.8	26.1	
	6H	25.0	25.8	25.3	26.1	26.4	25.0	25.8	25.3	26.1	26.4	
	8H	25.3	26.1	25.7	26.4	26.8	25.3	26.1	25.7	26.4	26.8	
	12H	25.7	26.5	26.1	26.9	27.3	25.7	26.5	26.1	26.9	27.3	
8H	4H	24.7	25.5	25.0	25.8	26.1	24.7	25.5	25.0	25.8	26.1	
	6H	25.8	26.6	26.2	27.0	27.4	25.8	26.6	26.2	27.0	27.4	
	8H	26.3	27.0	26.8	27.5	27.9	26.3	27.0	26.8	27.5	27.9	
	12H	26.6	27.2	27.1	27.6	28.1	26.6	27.2	27.1	27.6	28.1	
12H	4H	24.9	25.7	25.3	26.0	26.4	24.9	25.7	25.3	26.0	26.4	
	6H	26.0	26.7	26.5	27.2	27.6	26.0	26.7	26.5	27.2	27.6	
	8H	26.4	27.0	26.9	27.4	27.9	26.4	27.0	26.9	27.4	27.9	
variation of observer position												
S =	1.0H	+0.1/			-0.1			+0.1/		-0.1		
	1.5H	+0.2/			-0.3			+0.2/		-0.3		
	2.0H	+0.3/			-0.5			+0.3/		-0.5		
standard-table	BK07					BK07						
correction for luminaire	9.2					9.2						
correct glare indices for a total flux of 1045lm												

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	

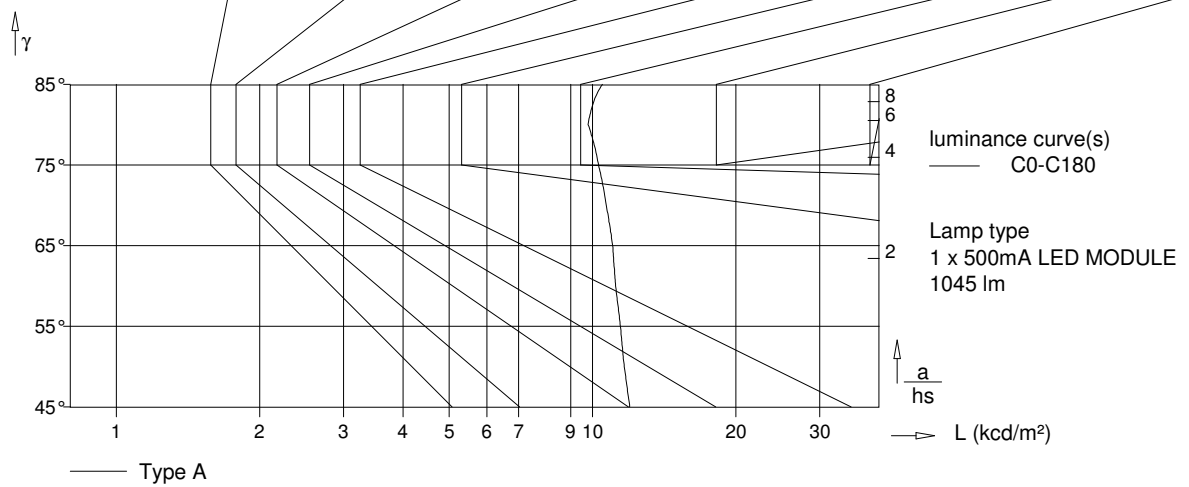
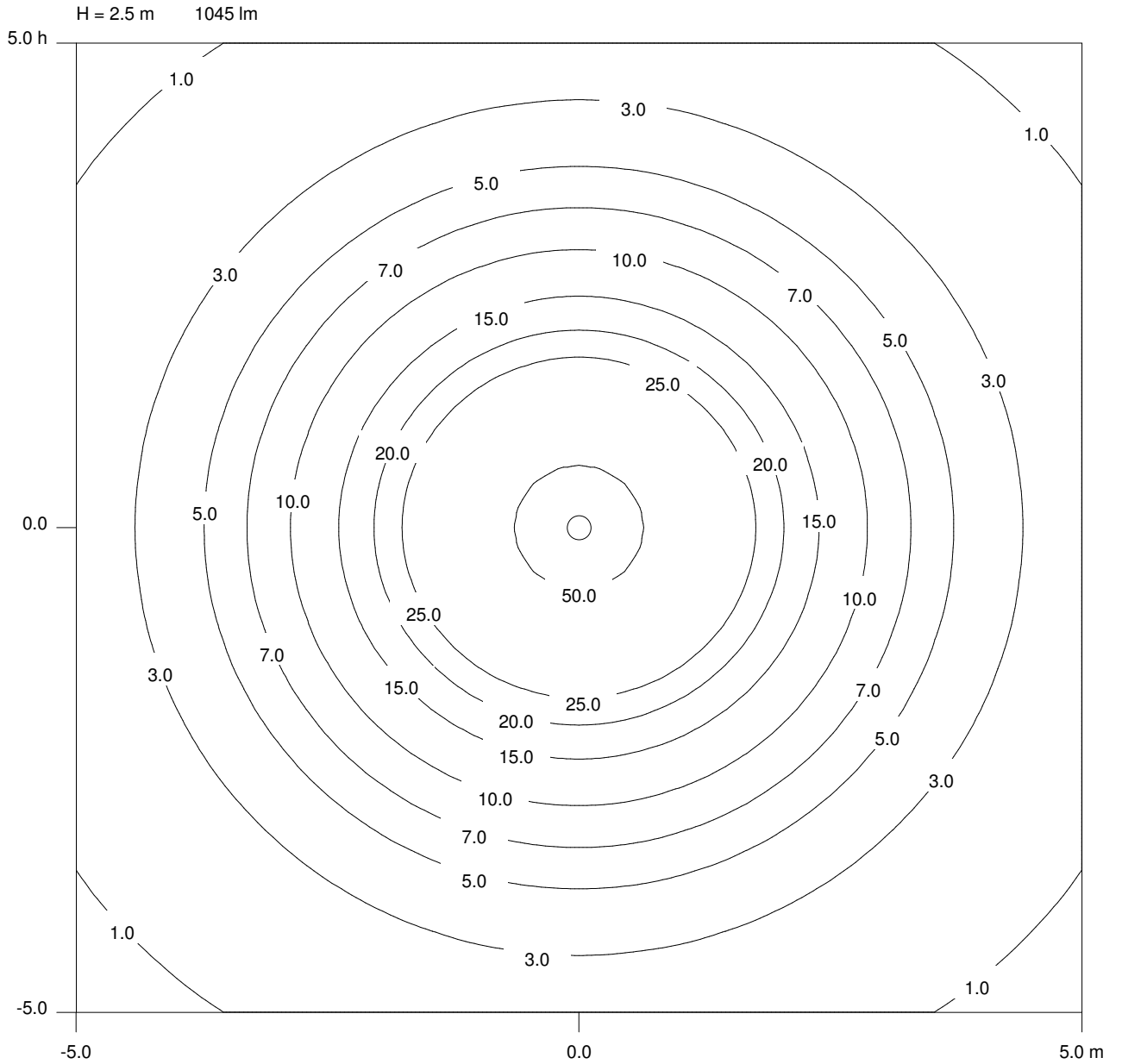


Tabelle der berechneten Leuchtdichten

gamma	C 0	C 90	C 180	C 270
45°	11972.8	11972.8	11972.8	11972.8
50°	11657.1	11657.1	11657.1	11657.1
55°	11444.4	11444.4	11444.4	11444.4
60°	11182.4	11182.4	11182.4	11182.4
65°	11023.5	11023.5	11023.5	11023.5
70°	10690.0	10690.0	10690.0	10690.0
75°	10295.8	10295.8	10295.8	10295.8
80°	9784.8	9784.8	9784.8	9784.8
85°	10487.6	10487.6	10487.6	10487.6

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	56	66	73	79	86	91	95	99	102
70	30	20	48	58	66	71	80	85	89	95	99
70	10	20	42	52	60	66	74	80	85	91	95
50	50	20	54	64	71	76	83	88	91	95	98
50	30	20	47	57	64	70	77	83	87	92	95
50	10	20	42	52	59	65	73	78	83	89	92
30	50	20	53	62	68	73	80	84	87	92	94
30	30	20	46	56	63	68	75	80	84	89	92
30	10	20	41	51	58	64	71	77	81	86	89
0	0	0	39	48	55	61	68	73	77	82	85
BZ-class			5	5	5	5	5	5	5	5	5
SHRnom : 1.25						SHRmax : 1.466					



filename : NHE18-LED-850.ltd
 meas. number : 1483/C2
 luminaire number : NHE18/LED/850
 date / operator : 01-06-2015



default lamp type(s)

no of lamps	lamp type	luminaire lumens	input wattage
1	500mA LED 5000K MODULE	1100 lm	18.4 W

dimensions

luminaire		luminous area	
diameter	: 240 mm	diameter	: 190 mm
height	: 40 mm	height	: 0 mm

coordinate system

no of planes	: 1	samples / plane	: 37
first c-plane	: 0.0 °	first gamma-angle	: 0.0 °
step angle	: 0.0 °	step angle	: 5.0 °
last c-plane	: 0.0 °	last gamma-angle	: 180.0 °
symmetrics	: rotational symmetry		

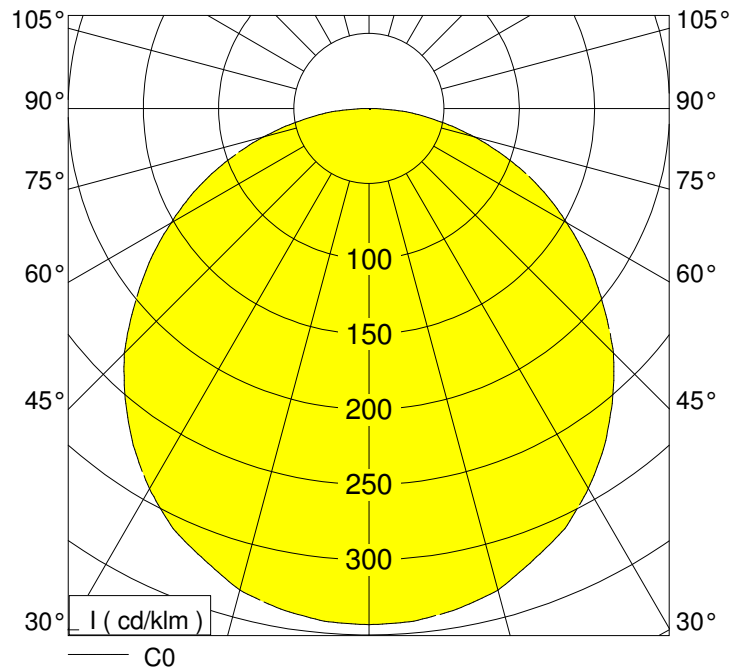
performance

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

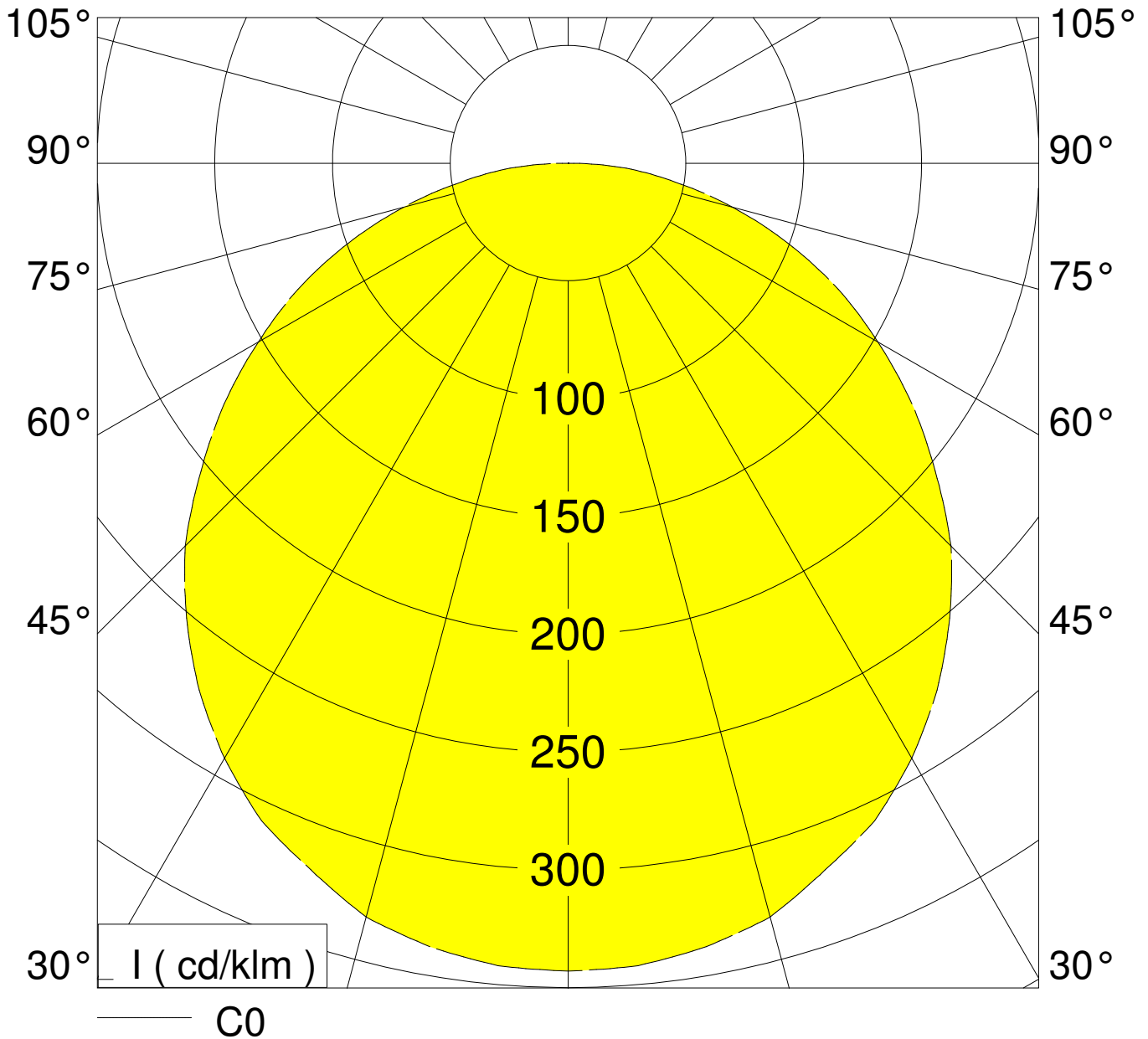
classification

LiTG / DIN	: A40
UTE	: 1.00E
CIE	: 46 77 95 100 100
BZ	: 5 5 5 5 5 5 5 5

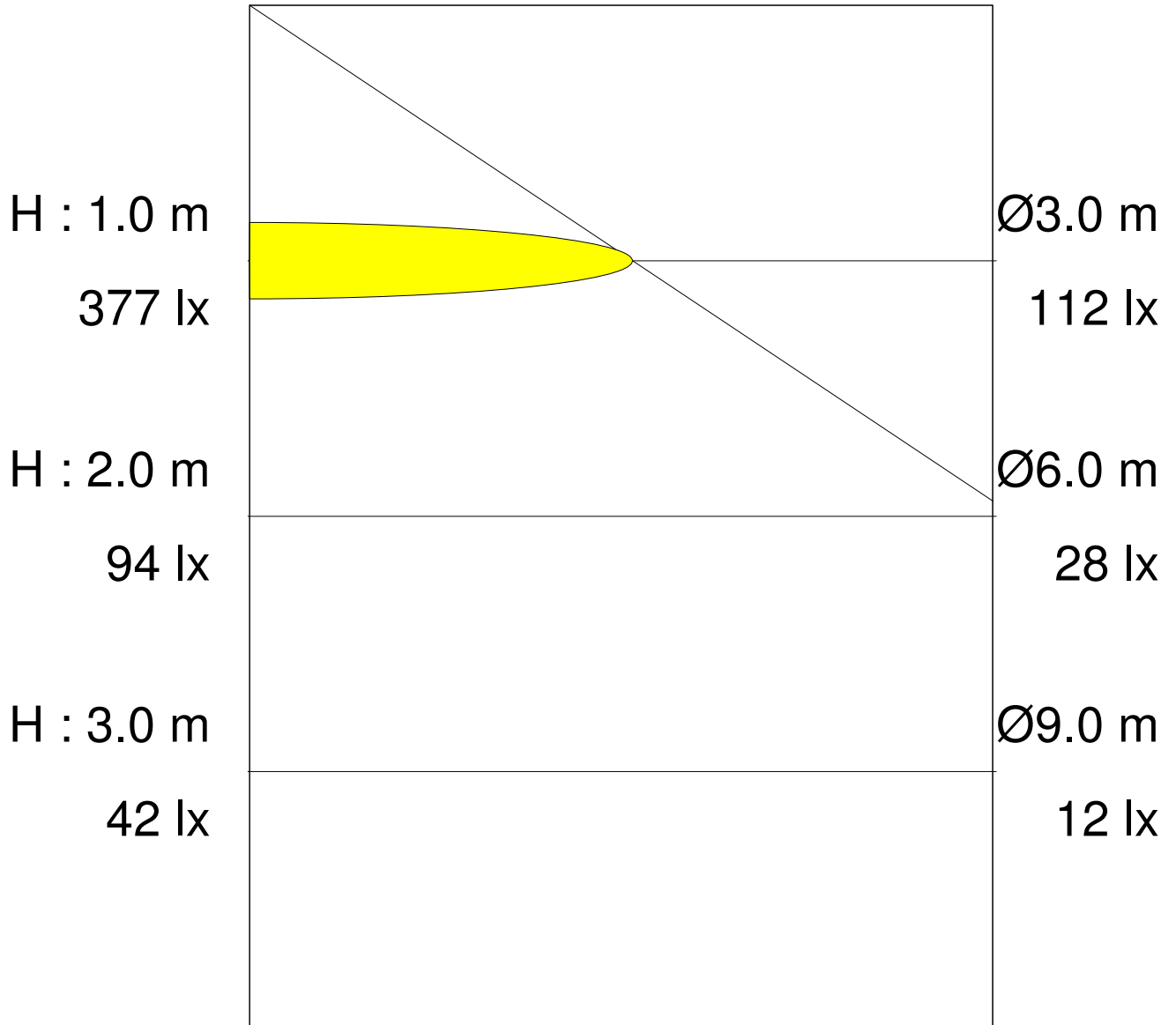
Ambient Temperature	: 25 degC
Input Voltage	: 240 V
Circuit Watts	: 18.4 W
Amps (running)	: 0.079 A
V.A.	: 18.97 VA
Power Factor	: 0.97
CCT	: 5000K (declared)
Luminaire Lumens	: 1100 Lm
Output current DC	: 500 mA
Output Voltage DC	: 31.0 V
Output Power	: 15.50 W
Luminaire Lm/CircWatt	: 59.8 Lum Lm/circW
Driver Efficiency	: 84%
Driver Details	: OPTOTRONIC OTe
25/220-240/700CS	



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 : 112.6°



	C 0.0
0.0°	342.70
5.0°	341.70
10.0°	337.50
15.0°	331.10
20.0°	319.00
25.0°	307.80
30.0°	291.50
35.0°	272.90
40.0°	251.80
45.0°	229.70
50.0°	203.30
55.0°	178.10
60.0°	151.70
65.0°	126.40
70.0°	99.20
75.0°	72.30
80.0°	46.10
85.0°	24.80
90.0°	0.00
95.0°	0.00
100.0°	0.00
105.0°	0.00
110.0°	0.00
115.0°	0.00
120.0°	0.00
125.0°	0.00
130.0°	0.00
135.0°	0.00
140.0°	0.00
145.0°	0.00
150.0°	0.00
155.0°	0.00
160.0°	0.00
165.0°	0.00
170.0°	0.00
175.0°	0.00
180.0°	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	21.5	23.0	21.8	23.2	23.4	21.5	23.0	21.8	23.2	23.4
	3H	22.6	23.7	22.8	23.9	24.1	22.6	23.7	22.8	23.9	24.1
	4H	23.3	24.5	23.6	24.7	24.9	23.3	24.5	23.6	24.7	24.9
	6H	23.9	25.0	24.2	25.2	25.5	23.9	25.0	24.2	25.2	25.5
	8H	24.2	25.3	24.5	25.5	25.7	24.2	25.3	24.5	25.5	25.7
	12H	24.4	25.5	24.8	25.7	26.0	24.4	25.5	24.8	25.7	26.0
4H	2H	21.7	22.8	21.9	23.0	23.2	21.7	22.8	21.9	23.0	23.2
	3H	23.7	24.7	24.0	25.0	25.2	23.7	24.7	24.0	25.0	25.2
	4H	24.6	25.7	25.0	25.9	26.2	24.6	25.7	25.0	25.9	26.2
	6H	25.1	26.0	25.5	26.3	26.6	25.1	26.0	25.5	26.3	26.6
	8H	25.5	26.3	25.9	26.6	26.9	25.5	26.3	25.9	26.6	26.9
	12H	25.9	26.7	26.3	27.1	27.4	25.9	26.7	26.3	27.1	27.4
8H	4H	24.8	25.6	25.2	26.0	26.3	24.8	25.6	25.2	26.0	26.3
	6H	26.0	26.7	26.4	27.1	27.6	26.0	26.7	26.4	27.1	27.6
	8H	26.5	27.2	27.0	27.6	28.1	26.5	27.2	27.0	27.6	28.1
	12H	26.8	27.4	27.2	27.8	28.3	26.8	27.4	27.2	27.8	28.3
12H	4H	25.1	25.8	25.5	26.2	26.6	25.1	25.8	25.5	26.2	26.6
	6H	26.2	26.9	26.7	27.4	27.8	26.2	26.9	26.7	27.4	27.8
	8H	26.6	27.1	27.0	27.6	28.1	26.6	27.1	27.0	27.6	28.1
variation of observer position											
S =	1.0H	+0.1/		-0.1		+0.1/		-0.1			
	1.5H	+0.2/		-0.3		+0.2/		-0.3			
	2.0H	+0.3/		-0.5		+0.3/		-0.5			
standard-table	BK07					BK07					
correction for luminaire	9.4					9.4					
correct glare indices for a total flux of 1100lm											

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	

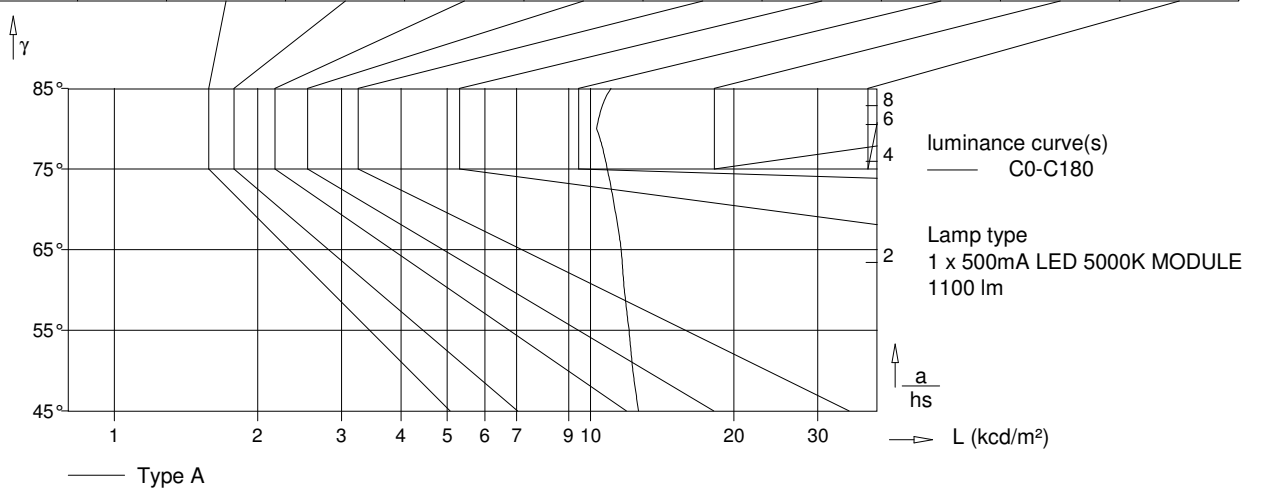
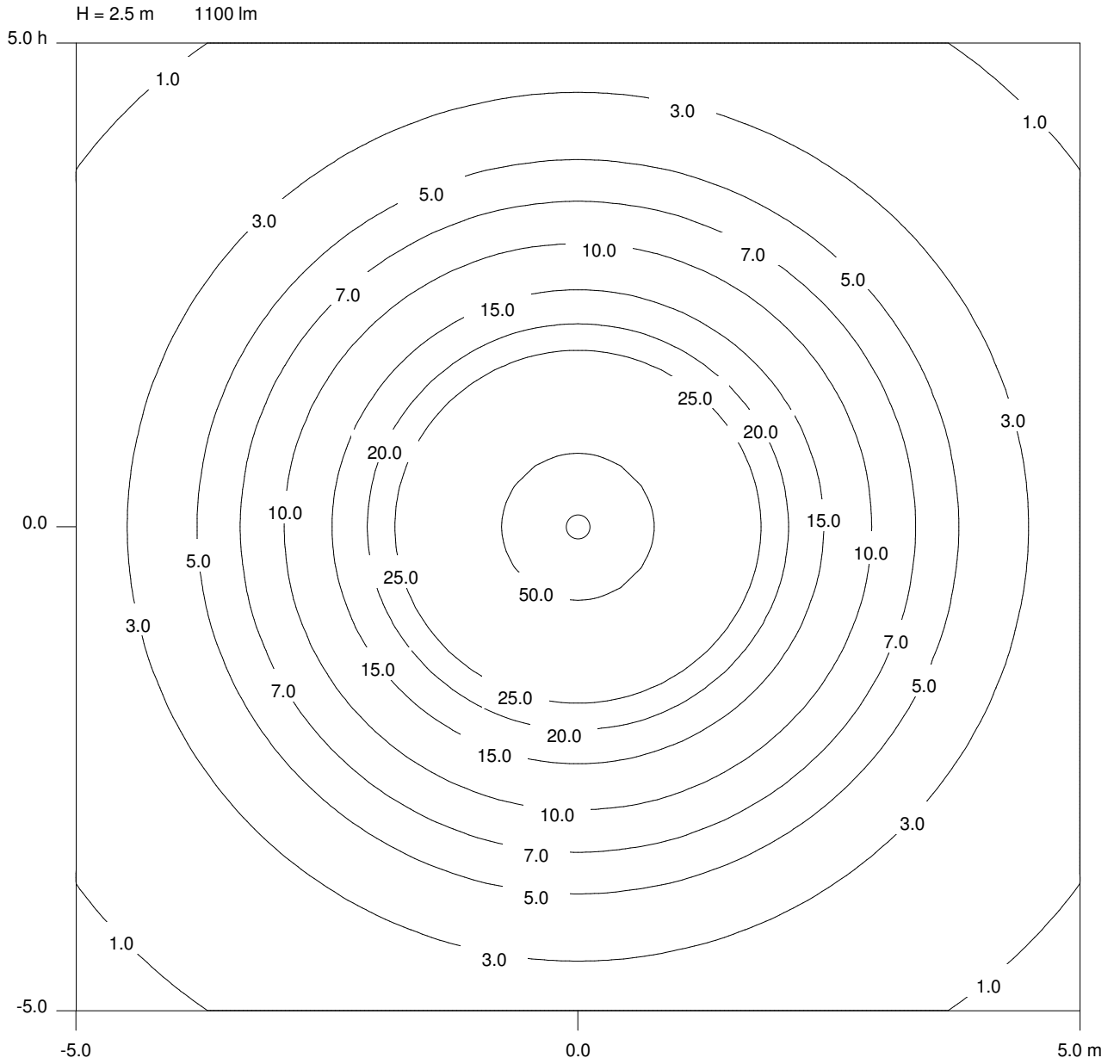


Tabelle der berechneten Leuchtdichten

gamma	C 0	C 90	C 180	C 270
45°	12602.9	12602.9	12602.9	12602.9
50°	12270.6	12270.6	12270.6	12270.6
55°	12046.7	12046.7	12046.7	12046.7
60°	11770.9	11770.9	11770.9	11770.9
65°	11603.6	11603.6	11603.6	11603.6
70°	11252.7	11252.7	11252.7	11252.7
75°	10837.7	10837.7	10837.7	10837.7
80°	10299.7	10299.7	10299.7	10299.7
85°	11039.5	11039.5	11039.5	11039.5

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	56	66	73	79	86	91	95	99	102
70	30	20	48	58	66	71	80	85	89	95	99
70	10	20	42	52	60	66	74	80	85	91	95
50	50	20	54	64	71	76	83	88	91	95	98
50	30	20	47	57	64	70	77	83	87	92	95
50	10	20	42	52	59	65	73	78	83	89	92
30	50	20	53	62	68	73	80	84	87	92	94
30	30	20	46	56	63	68	75	80	84	89	92
30	10	20	41	51	58	64	71	77	81	86	89
0	0	0	39	48	55	61	68	73	77	82	85
BZ-class			5	5	5	5	5	5	5	5	5
SHRnom : 1.25						SHRmax : 1.466					



Report of Photometry & Chromaticity of NVC Lighting Ltd. HORTEN NHE24/LED/830

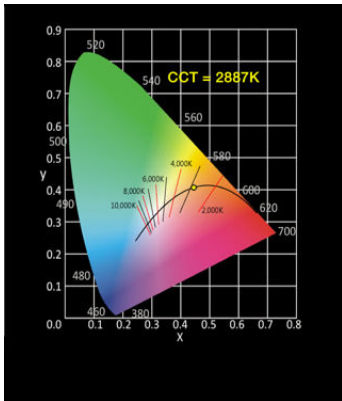
A. Product Description



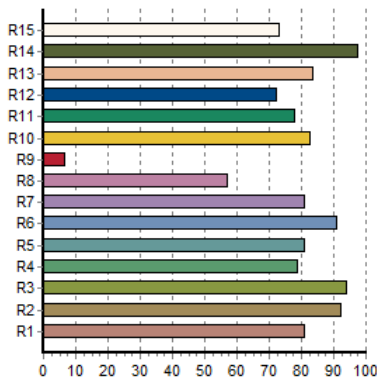
Product Name nhe24led830 Sample Number 1456
 Date 19-05-2015
 Manufacturer NVC Lighting Ltd.
 Tester LightLab Photometrics Ltd. Reviewer KB
 Temperature 25degC Re. Humidity(%) 57
 Spectrum Range : 380 ~ 780 nm. Wavelength Step : 1 nm.

C. Photometry and Chromaticity

CIE_x	0.4454	Duv	0.0002
CIE_y	0.4072	d(nm)	583.3
CIE_u'	0.2547	Purity(%)	56.0
CIE_v'	0.5239	FWHM(nm)	122.0
CCT(K)	2887	SP ratio	1.32
Luminaire Lumens	1750	PPFD(umol/sec m^2)	
p(nm)	607.0		22.20

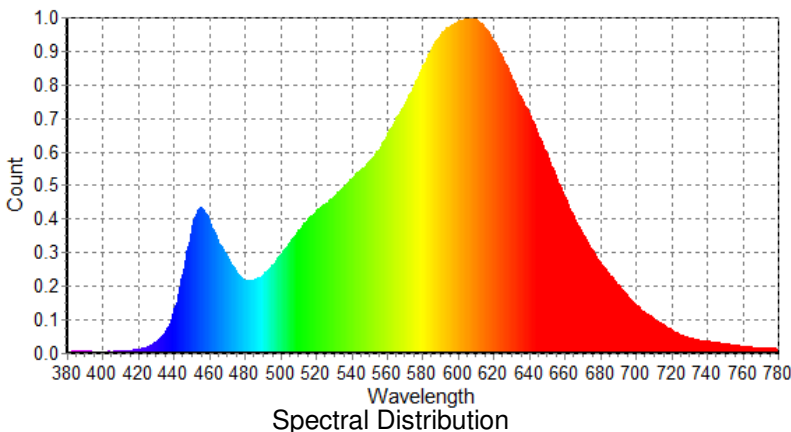


CIE1931 Chromaticity Diagram

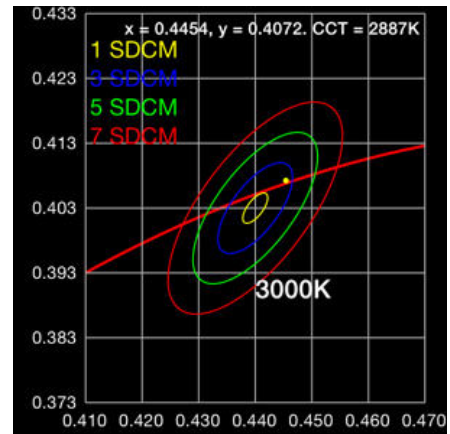


Histogram Diagram of CRI

CRI(Ra)	82	Re(thru R1~R15)	77
Qa	84		
R1	81.2	R6	91.4
R2	92.6	R7	81.2
R3	94.5	R8	57.5
R4	79.1	R9	6.9
R5	81.5	R10	83.0
		R11	78.2
		R12	72.7
		R13	84.1
		R14	97.7
		R15	73.5



Spectral Distribution



IEC SDCM

filename : NHE24-LED-830.LDT
 meas. number : 1456
 luminaire number : NHE24/LED/830
 date / operator : 11-05-2015



default lamp type(s)

no of lamps	lamp type	luminaire lumens	input wattage
1	700mA LED MODULE	1750 lm	24.6 W

dimensions

luminaire	luminous area
diameter : 320 mm	diameter : 260 mm
height : 45 mm	height : 0 mm

coordinate system

no of planes : 1	samples / plane : 37
first c-plane : 0.0 °	first gamma-angle : 0.0 °
step angle : 0.0 °	step angle : 5.0 °
last c-plane : 0.0 °	last gamma-angle : 180.0 °
symmetrics : rotational symmetry	

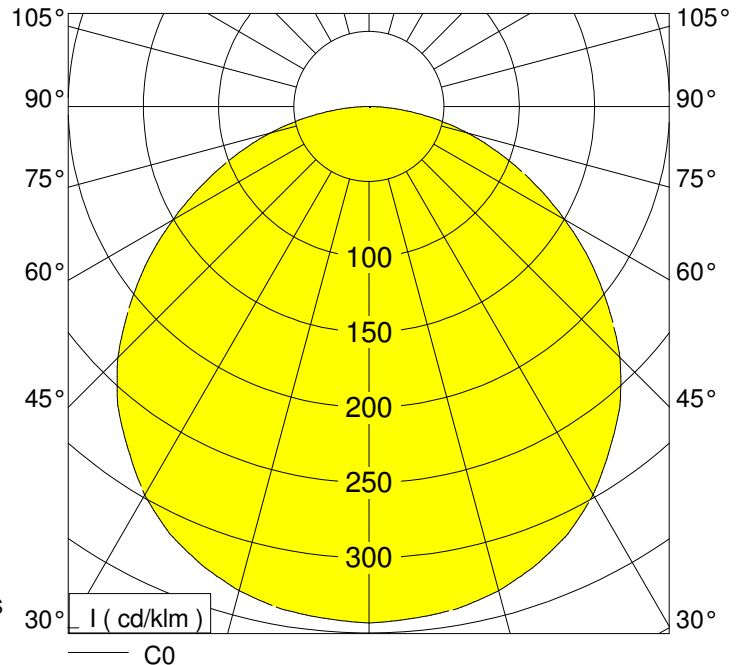
performance

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

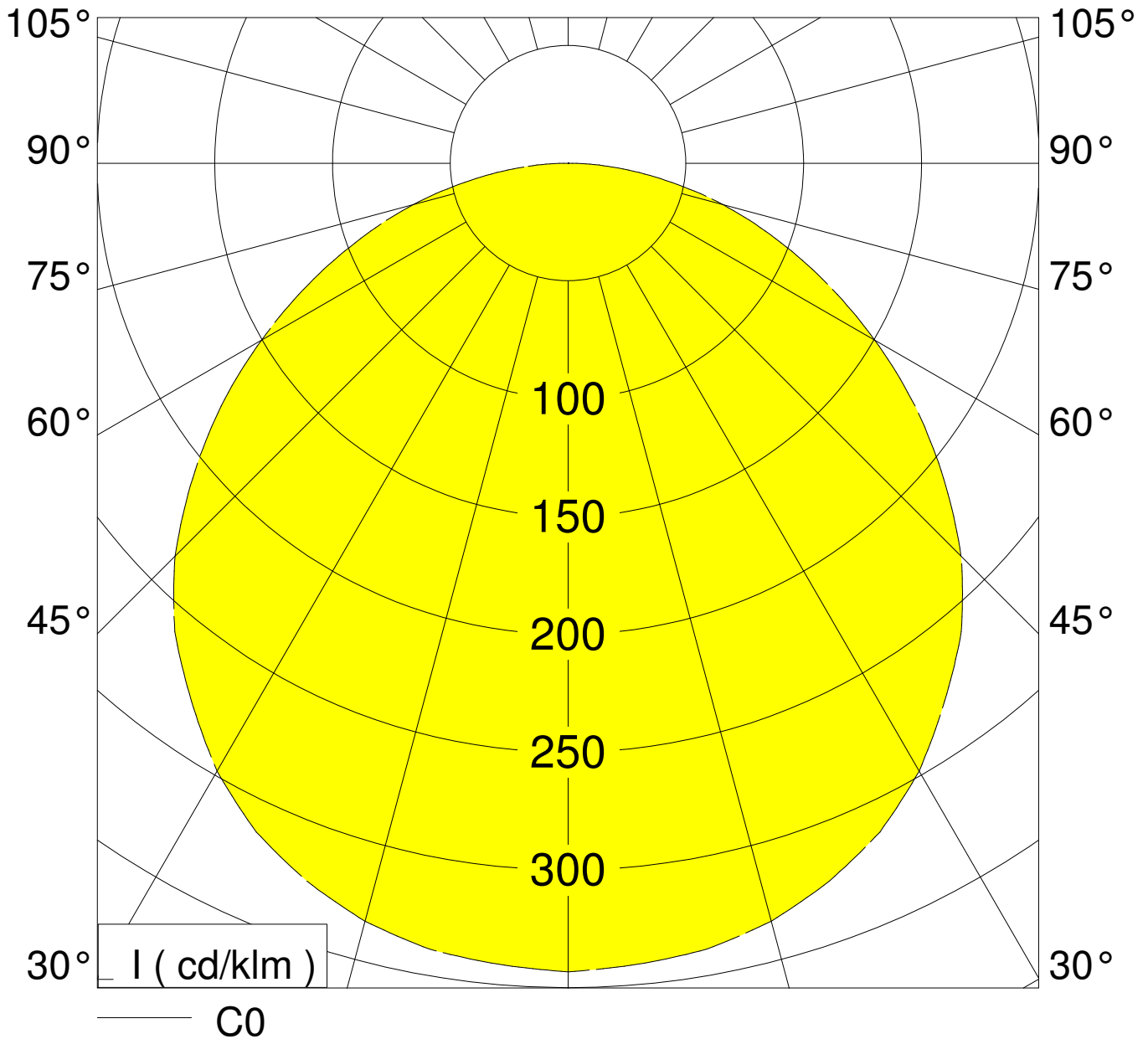
classification

LiTG / DIN : A40
UTE : 1.00D1.00E
CIE : 47 79 95 100 100
BZ : 5 5 5 5 5 5 5 5

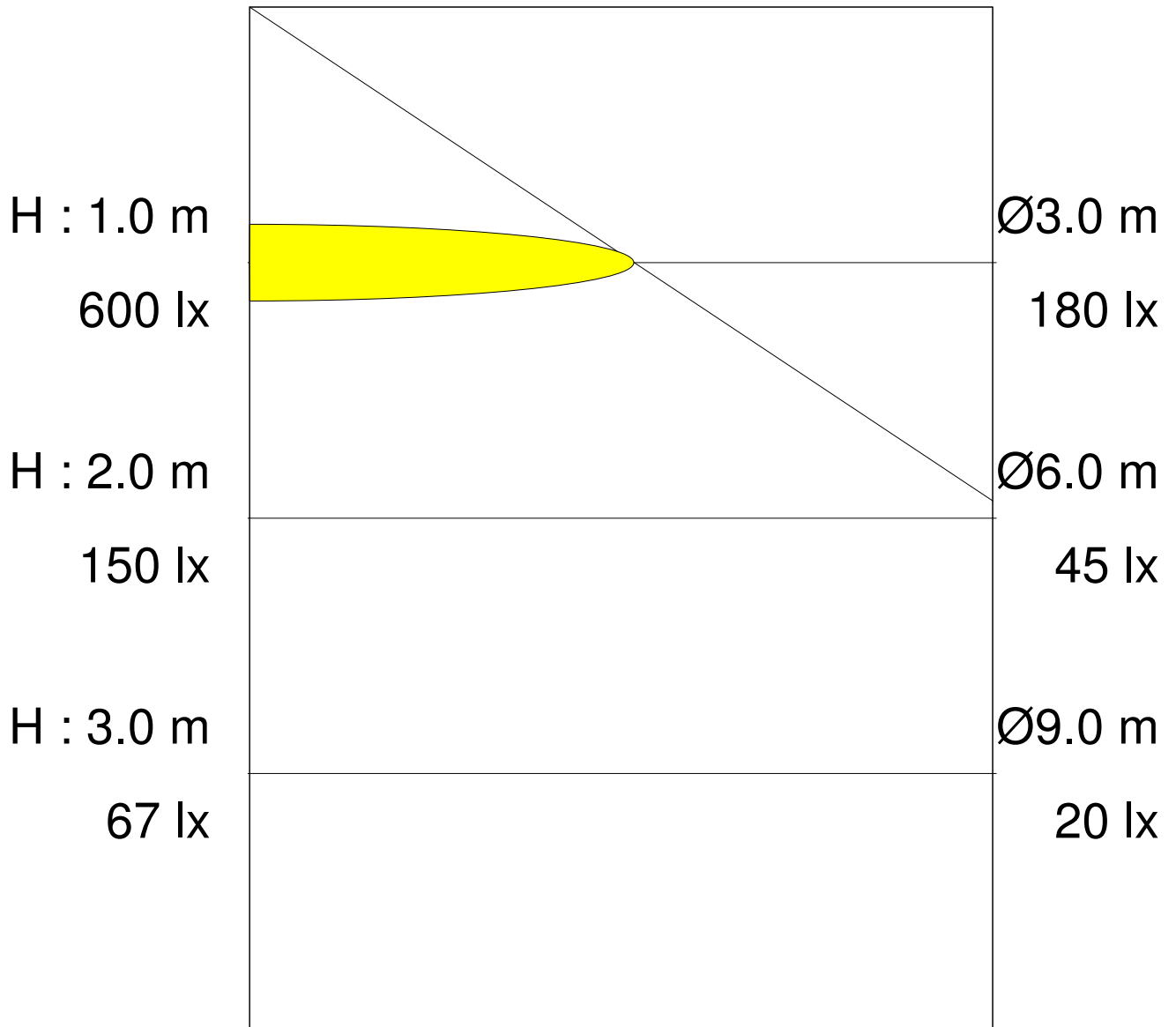
Ambient Temperature : 25 degC
Input Voltage : 240 V
Circuit Watts : 24.6 W
Amps (running) : 0.105 A
V.A. : 25.10 VA
Power Factor : 0.98
CCT : 2887K (measured): 3000K (declared)
Luminaire Lumens : 1750
Output current DC : 700 mA
Output Voltage DC : 30.5 V
Output Power : 21.35 W
Luminaire Lm/CircWatt : 71.14 Lum Lm/circW
Driver Efficiency : 87%
Driver Details : OPTOTRONIC OTe 25/220-240-700CS



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 : 112.8°



	C 0.0
0.0°	343.00
5.0°	341.10
10.0°	338.60
15.0°	332.90
20.0°	324.10
25.0°	313.00
30.0°	297.80
35.0°	278.50
40.0°	259.50
45.0°	235.80
50.0°	207.90
55.0°	179.70
60.0°	150.20
65.0°	121.40
70.0°	93.70
75.0°	68.00
80.0°	42.10
85.0°	18.80
90.0°	0.00
95.0°	0.00
100.0°	0.00
105.0°	0.00
110.0°	0.00
115.0°	0.00
120.0°	0.00
125.0°	0.00
130.0°	0.00
135.0°	0.00
140.0°	0.00
145.0°	0.00
150.0°	0.00
155.0°	0.00
160.0°	0.00
165.0°	0.00
170.0°	0.00
175.0°	0.00
180.0°	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	21.0	22.5	21.2	22.7	22.9	21.0	22.5	21.2	22.7	22.9
	3H	21.9	23.0	22.1	23.2	23.4	21.9	23.0	22.1	23.2	23.4
	4H	22.6	23.7	22.9	23.9	24.1	22.6	23.7	22.9	23.9	24.1
	6H	23.1	24.2	23.4	24.4	24.6	23.1	24.2	23.4	24.4	24.6
	8H	23.3	24.4	23.6	24.6	24.9	23.3	24.4	23.6	24.6	24.9
	12H	23.5	24.5	23.8	24.8	25.1	23.5	24.5	23.8	24.8	25.1
4H	2H	21.1	22.2	21.3	22.4	22.6	21.1	22.2	21.3	22.4	22.6
	3H	22.9	24.0	23.2	24.2	24.5	22.9	24.0	23.2	24.2	24.5
	4H	23.8	24.9	24.2	25.1	25.4	23.8	24.9	24.2	25.1	25.4
	6H	24.3	25.1	24.6	25.4	25.7	24.3	25.1	24.6	25.4	25.7
	8H	24.6	25.4	24.9	25.7	26.0	24.6	25.4	24.9	25.7	26.0
	12H	24.9	25.7	25.3	26.1	26.5	24.9	25.7	25.3	26.1	26.5
8H	4H	24.0	24.8	24.4	25.1	25.5	24.0	24.8	24.4	25.1	25.5
	6H	25.1	25.8	25.5	26.2	26.7	25.1	25.8	25.5	26.2	26.7
	8H	25.5	26.2	26.0	26.7	27.1	25.5	26.2	26.0	26.7	27.1
	12H	25.7	26.3	26.2	26.7	27.2	25.7	26.3	26.2	26.7	27.2
12H	4H	24.2	25.0	24.7	25.4	25.8	24.2	25.0	24.7	25.4	25.8
	6H	25.3	26.0	25.8	26.4	26.9	25.3	26.0	25.8	26.4	26.9
	8H	25.6	26.2	26.1	26.6	27.1	25.6	26.2	26.1	26.6	27.1
variation of observer position											
S =	1.0H	+0.1/		-0.1		+0.1/		-0.1			
	1.5H	+0.2/		-0.3		+0.2/		-0.3			
	2.0H	+0.4/		-0.6		+0.4/		-0.6			
standard-table	BK06					BK06					
correction for luminaire	8.1					8.1					
correct glare indices for a total flux of 1750lm											

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	

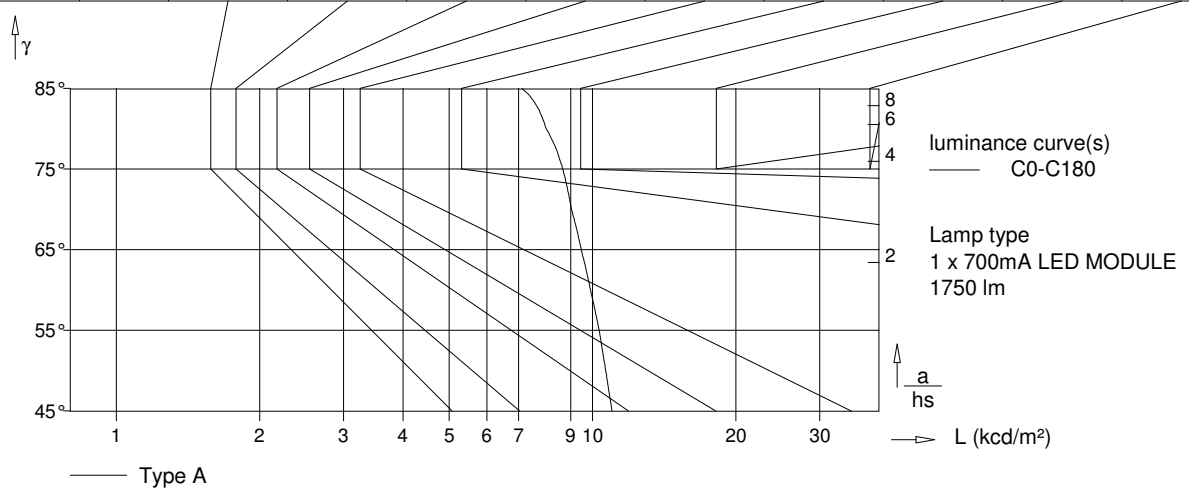
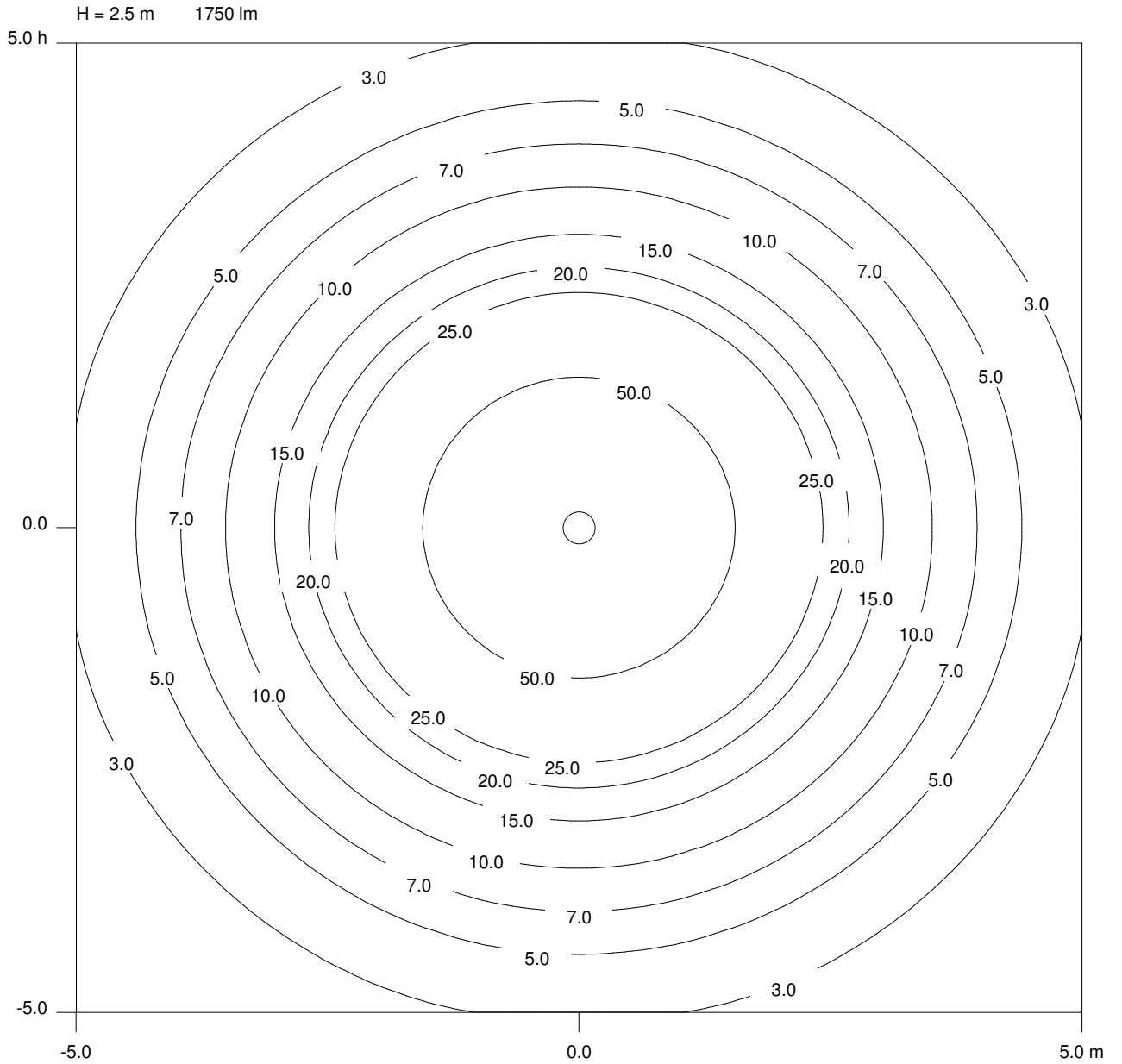


Tabelle der berechneten Leuchtdichten

gamma	C 0	C 90	C 180	C 270
45°	10991.6	10991.6	10991.6	10991.6
50°	10660.8	10660.8	10660.8	10660.8
55°	10326.6	10326.6	10326.6	10326.6
60°	9901.5	9901.5	9901.5	9901.5
65°	9468.3	9468.3	9468.3	9468.3
70°	9030.0	9030.0	9030.0	9030.0
75°	8659.9	8659.9	8659.9	8659.9
80°	7991.2	7991.2	7991.2	7991.2
85°	7109.9	7109.9	7109.9	7109.9

alle Werte in cd/m^2

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	56	67	74	79	87	92	95	100	103
70	30	20	48	59	66	72	80	86	90	96	99
70	10	20	42	53	61	67	75	81	86	92	96
50	50	20	54	64	71	76	83	88	91	96	99
50	30	20	47	58	65	70	78	83	87	92	96
50	10	20	42	52	60	65	74	79	83	89	93
30	50	20	53	63	69	74	81	85	88	92	95
30	30	20	47	57	64	69	76	81	84	89	92
30	10	20	42	52	59	64	72	77	81	87	90
0	0	0	40	49	56	61	69	74	77	82	85
BZ-class			5	5	5	5	5	5	5	5	5
SHRnom : 1.25						SHRmax : 1.482					



filename : NHE24-LED-850.LDT
 meas. number : 1483/C3
 luminaire number : NHE24/LED/850
 date / operator : 01-06-2015



default lamp type(s)

no of lamps	lamp type	luminaire lumens	input wattage
1	700mA LED MODULE	1840 lm	24.6 W

dimensions

luminaire	luminous area
diameter : 320 mm	diameter : 260 mm
height : 45 mm	height : 0 mm

coordinate system

no of planes : 1	samples / plane : 37
first c-plane : 0.0 °	first gamma-angle : 0.0 °
step angle : 0.0 °	step angle : 5.0 °
last c-plane : 0.0 °	last gamma-angle : 180.0 °
symmetrics : rotational symmetry	

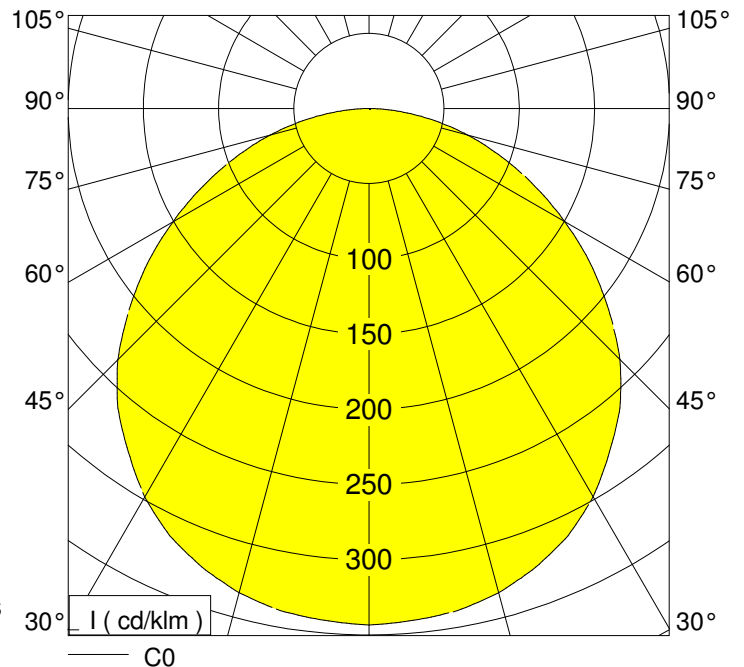
performance

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

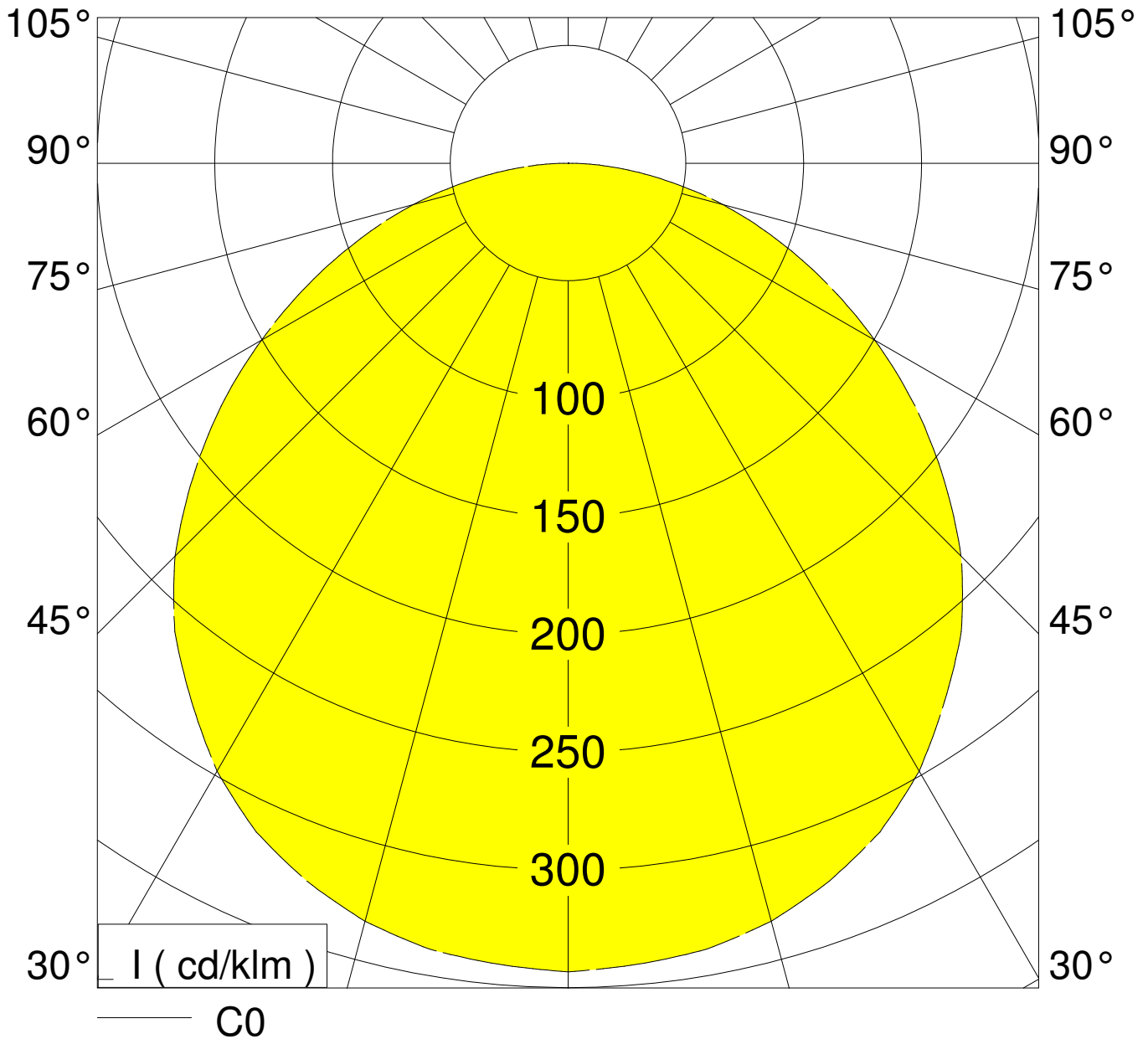
classification

LiTG / DIN : A40
UTE : 1.00D1.00E
CIE : 47 79 95 100 100
BZ : 5 5 5 5 5 5 5 5

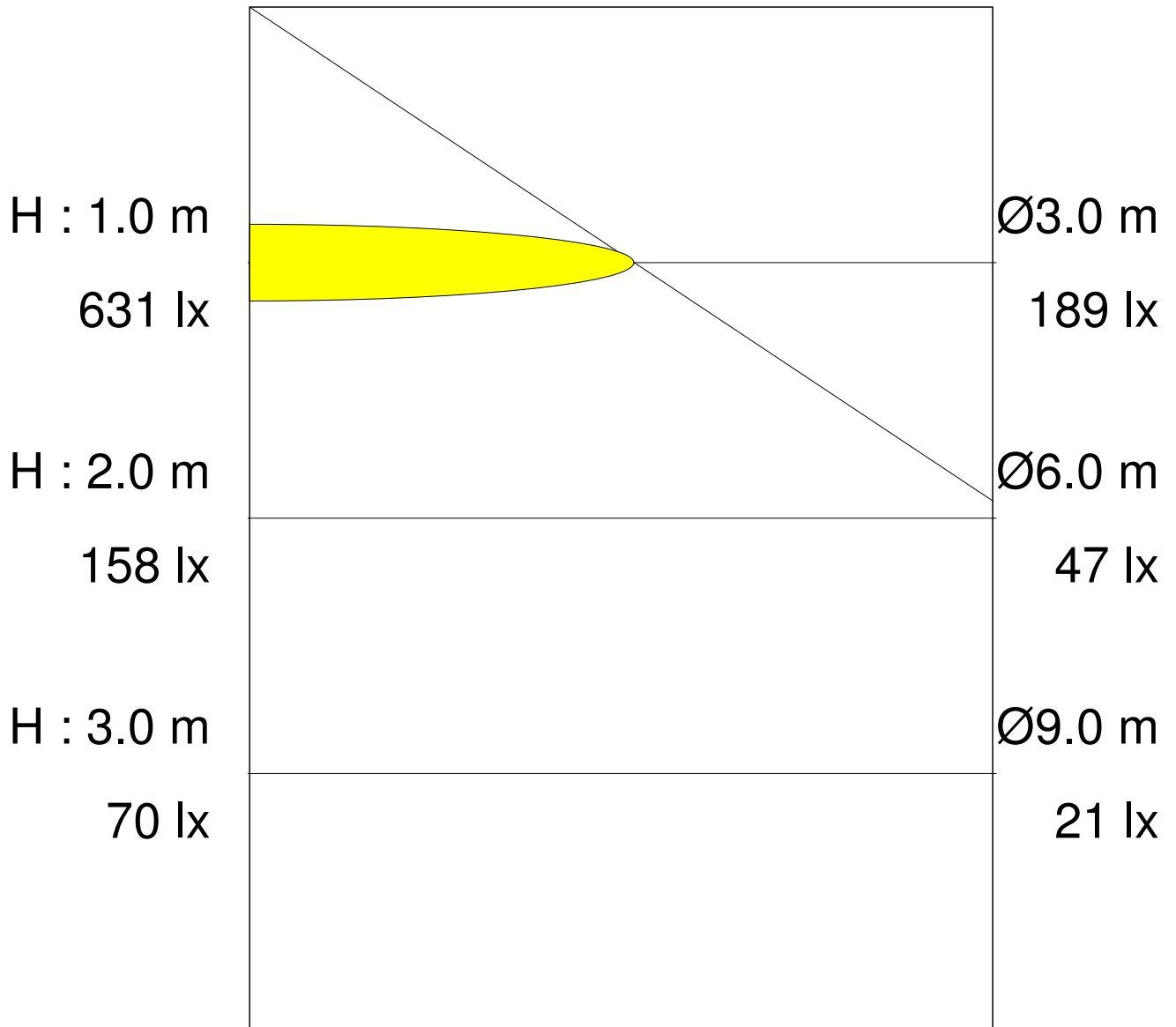
Ambient Temperature : 25 degC
Input Voltage : 240 V
Circuit Watts : 24.6 W
Amps (running) : 0.105 A
V.A. : 25.10 VA
Power Factor : 0.98
CCT : 5000K (declared)
Luminaire Lumens : 1840
Output current DC : 700 mA
Output Voltage DC : 30.5 V
Output Power : 21.35 W
Luminaire Lm/CircWatt : 74.8 Lum Lm/circW
Driver Efficiency : 87%
Driver Details : OPTOTRONIC OTe 25/220-240-700CS



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 : 112.8°



	C 0.0
0.0°	343.00
5.0°	341.10
10.0°	338.60
15.0°	332.90
20.0°	324.10
25.0°	313.00
30.0°	297.80
35.0°	278.50
40.0°	259.50
45.0°	235.80
50.0°	207.90
55.0°	179.70
60.0°	150.20
65.0°	121.40
70.0°	93.70
75.0°	68.00
80.0°	42.10
85.0°	18.80
90.0°	0.00
95.0°	0.00
100.0°	0.00
105.0°	0.00
110.0°	0.00
115.0°	0.00
120.0°	0.00
125.0°	0.00
130.0°	0.00
135.0°	0.00
140.0°	0.00
145.0°	0.00
150.0°	0.00
155.0°	0.00
160.0°	0.00
165.0°	0.00
170.0°	0.00
175.0°	0.00
180.0°	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	21.1	22.7	21.4	22.9	23.1	21.1	22.7	21.4	22.9	23.1
	3H	22.0	23.2	22.3	23.4	23.5	22.0	23.2	22.3	23.4	23.5
	4H	22.8	23.9	23.0	24.1	24.3	22.8	23.9	23.0	24.1	24.3
	6H	23.3	24.3	23.6	24.6	24.8	23.3	24.3	23.6	24.6	24.8
	8H	23.5	24.6	23.8	24.8	25.0	23.5	24.6	23.8	24.8	25.0
	12H	23.7	24.7	24.0	25.0	25.2	23.7	24.7	24.0	25.0	25.2
4H	2H	21.2	22.3	21.5	22.5	22.7	21.2	22.3	21.5	22.5	22.7
	3H	23.1	24.1	23.4	24.4	24.6	23.1	24.1	23.4	24.4	24.6
	4H	24.0	25.0	24.4	25.3	25.6	24.0	25.0	24.4	25.3	25.6
	6H	24.5	25.3	24.8	25.6	25.9	24.5	25.3	24.8	25.6	25.9
	8H	24.7	25.5	25.1	25.9	26.2	24.7	25.5	25.1	25.9	26.2
	12H	25.1	25.9	25.5	26.2	26.6	25.1	25.9	25.5	26.2	26.6
8H	4H	24.2	25.0	24.6	25.3	25.6	24.2	25.0	24.6	25.3	25.6
	6H	25.3	26.0	25.7	26.4	26.8	25.3	26.0	25.7	26.4	26.8
	8H	25.7	26.4	26.2	26.9	27.3	25.7	26.4	26.2	26.9	27.3
	12H	25.9	26.5	26.4	26.9	27.4	25.9	26.5	26.4	26.9	27.4
12H	4H	24.4	25.2	24.8	25.5	25.9	24.4	25.2	24.8	25.5	25.9
	6H	25.5	26.2	25.9	26.6	27.1	25.5	26.2	25.9	26.6	27.1
	8H	25.7	26.3	26.2	26.8	27.3	25.7	26.3	26.2	26.8	27.3
variation of observer position											
S =	1.0H	+0.1/		-0.1		+0.1/		-0.1			
	1.5H	+0.2/		-0.3		+0.2/		-0.3			
	2.0H	+0.4/		-0.6		+0.4/		-0.6			
standard-table	BK06					BK06					
correction for luminaire	8.3					8.3					
correct glare indices for a total flux of 1840lm											

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	

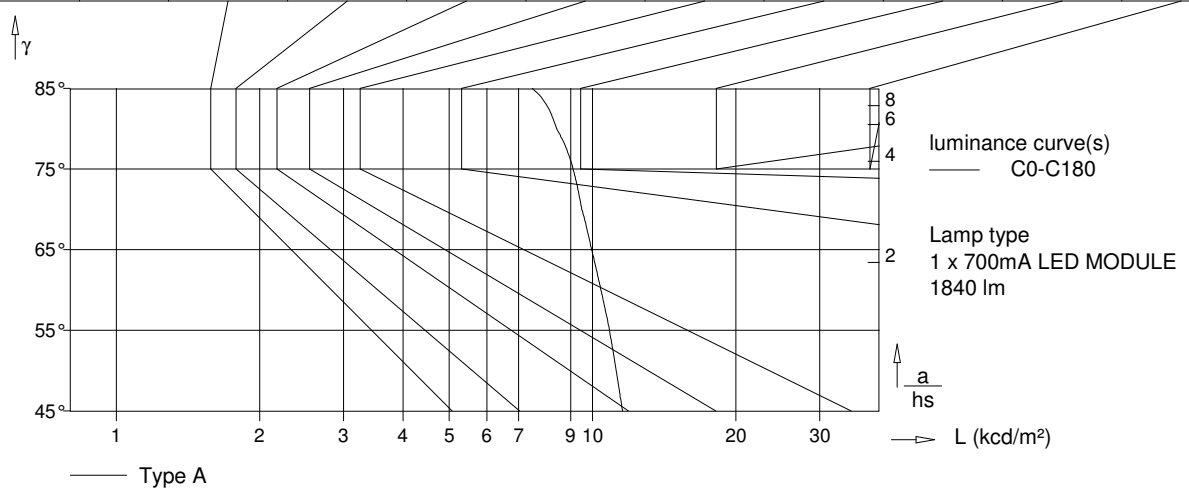
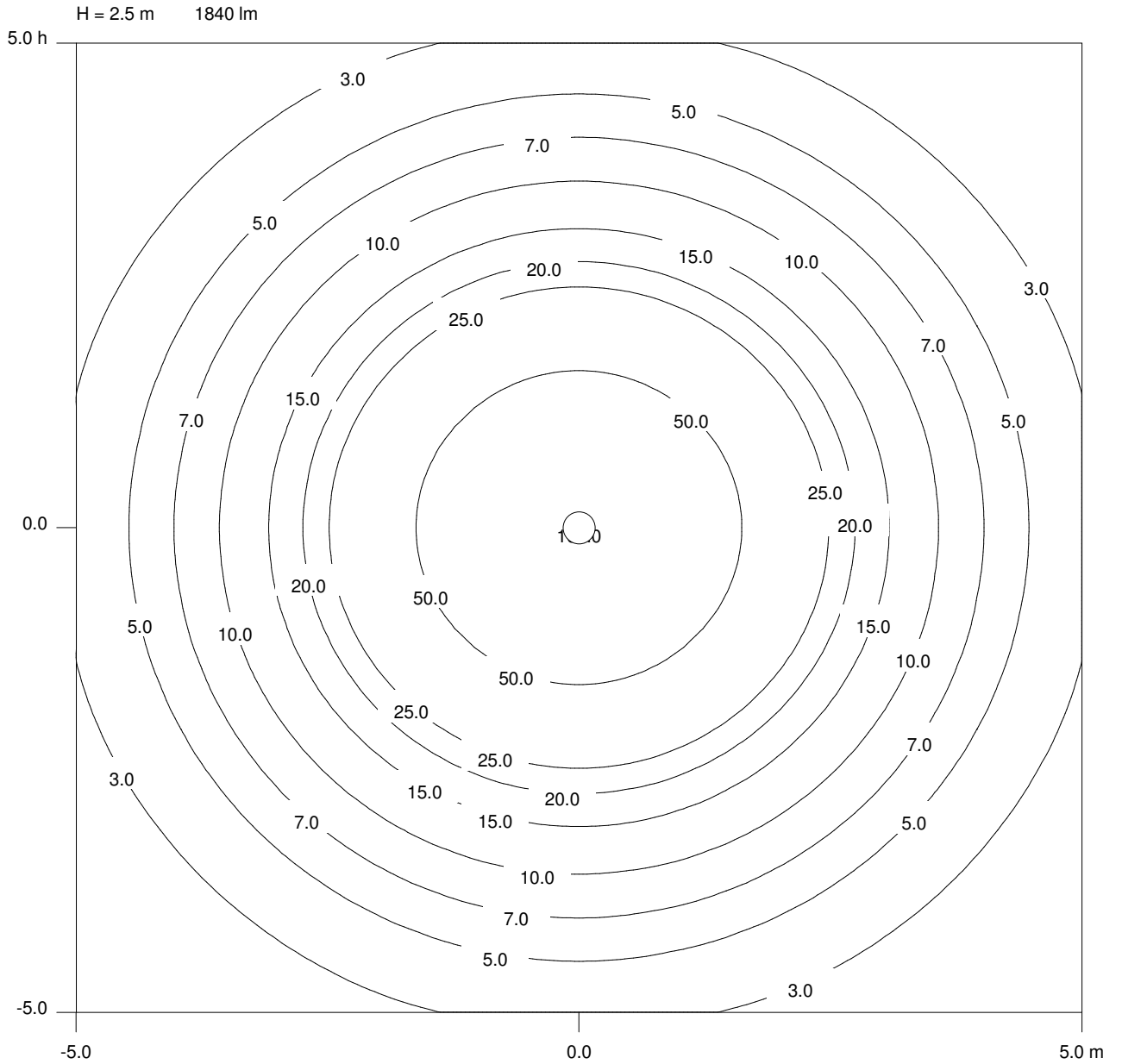


Tabelle der berechneten Leuchtdichten

gamma	C 0	C 90	C 180	C 270
45°	11556.9	11556.9	11556.9	11556.9
50°	11209.0	11209.0	11209.0	11209.0
55°	10857.7	10857.7	10857.7	10857.7
60°	10410.7	10410.7	10410.7	10410.7
65°	9955.2	9955.2	9955.2	9955.2
70°	9494.4	9494.4	9494.4	9494.4
75°	9105.3	9105.3	9105.3	9105.3
80°	8402.2	8402.2	8402.2	8402.2
85°	7475.5	7475.5	7475.5	7475.5

alle Werte in cd/m^2

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	56	67	74	79	87	92	95	100	103
70	30	20	48	59	66	72	80	86	90	96	99
70	10	20	42	53	61	67	75	81	86	92	96
50	50	20	54	64	71	76	83	88	91	96	99
50	30	20	47	58	65	70	78	83	87	92	96
50	10	20	42	52	60	65	74	79	83	89	93
30	50	20	53	63	69	74	81	85	88	92	95
30	30	20	47	57	64	69	76	81	84	89	92
30	10	20	42	52	59	64	72	77	81	87	90
0	0	0	40	49	56	61	69	74	77	82	85
BZ-class			5	5	5	5	5	5	5	5	5
SHRnom : 1.25						SHRmax : 1.482					

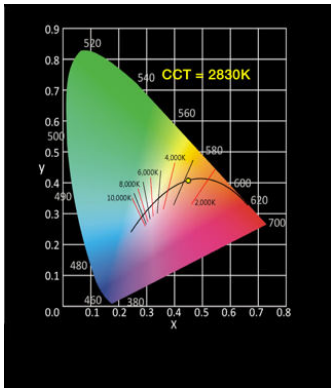


Report of Photometry & Chromaticity of NVC Lighting Ltd. HORTEN NHE13/LED/830



A. Product Description

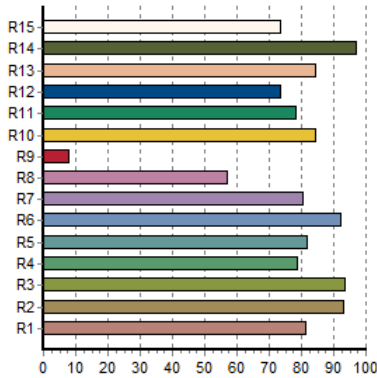
Product Name nhe13 led 830 350ma Sample Number 1454
 Date 19-05-2015
 Manufacturer NVC Lighting Ltd.
 Tester LightLab Photometrics Ltd. Reviewer KB
 Temperature 25degC Re. Humidity(%) 57
 Spectrum Range : 380 ~ 780 nm. Wavelength Step : 1 nm.



CIE1931 Chromaticity Diagram

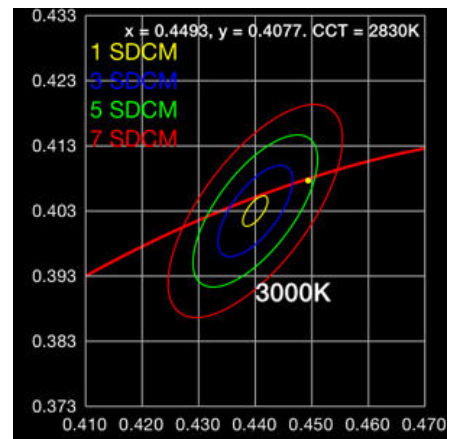
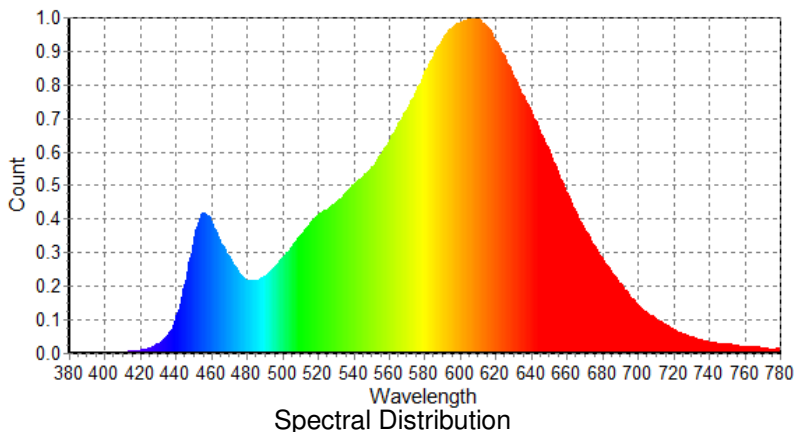
C. Photometry and Chromaticity

CIE_x	0.4493	Duv	0.0000
CIE_y	0.4077	d(nm)	583.6
CIE_u'	0.2570	Purity(%)	57.0
CIE_v'	0.5246	FWHM(nm)	120.0
CCT(K)	2830	SP ratio	1.30
Luminaire Lumens	790	PPFD(umol/sec m^2)	
p(nm)	609.0		13.73



CRI(Ra)	83	Re(thru R1~R15)	78
Qa	84		
R1	81.8	R6	92.4
R2	93.3	R7	80.9
R3	93.8	R8	57.6
R4	79.3	R9	8.4
R5	82.1	R10	84.6
		R11	78.6
		R12	74.1
		R13	84.8
		R14	97.3
		R15	74.0

Histogram Diagram of CRI



IEC SDCM

filename : NHE13-LED-830.LDT
 meas. number : 1454
 luminaire number : NHE13/LED/830
 date / operator : 11-05-2015



default lamp type(s)

no of lamps	lamp type	luminaire lumens	input wattage
1	LED MODULE	790 lm	13 W

dimensions

luminaire	luminous area
diameter : 170 mm	diameter : 120 mm
height : 40 mm	height : 0 mm

coordinate system

no of planes : 1	samples / plane : 37
first c-plane : 0.0 °	first gamma-angle : 0.0 °
step angle : 0.0 °	step angle : 5.0 °
last c-plane : 0.0 °	last gamma-angle : 180.0 °
symmetrics : rotational symmetry	

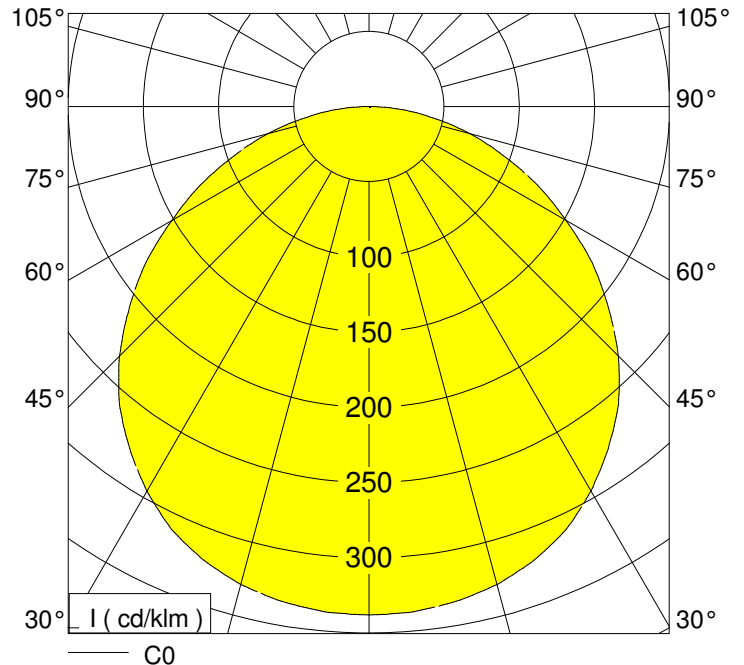
performance

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

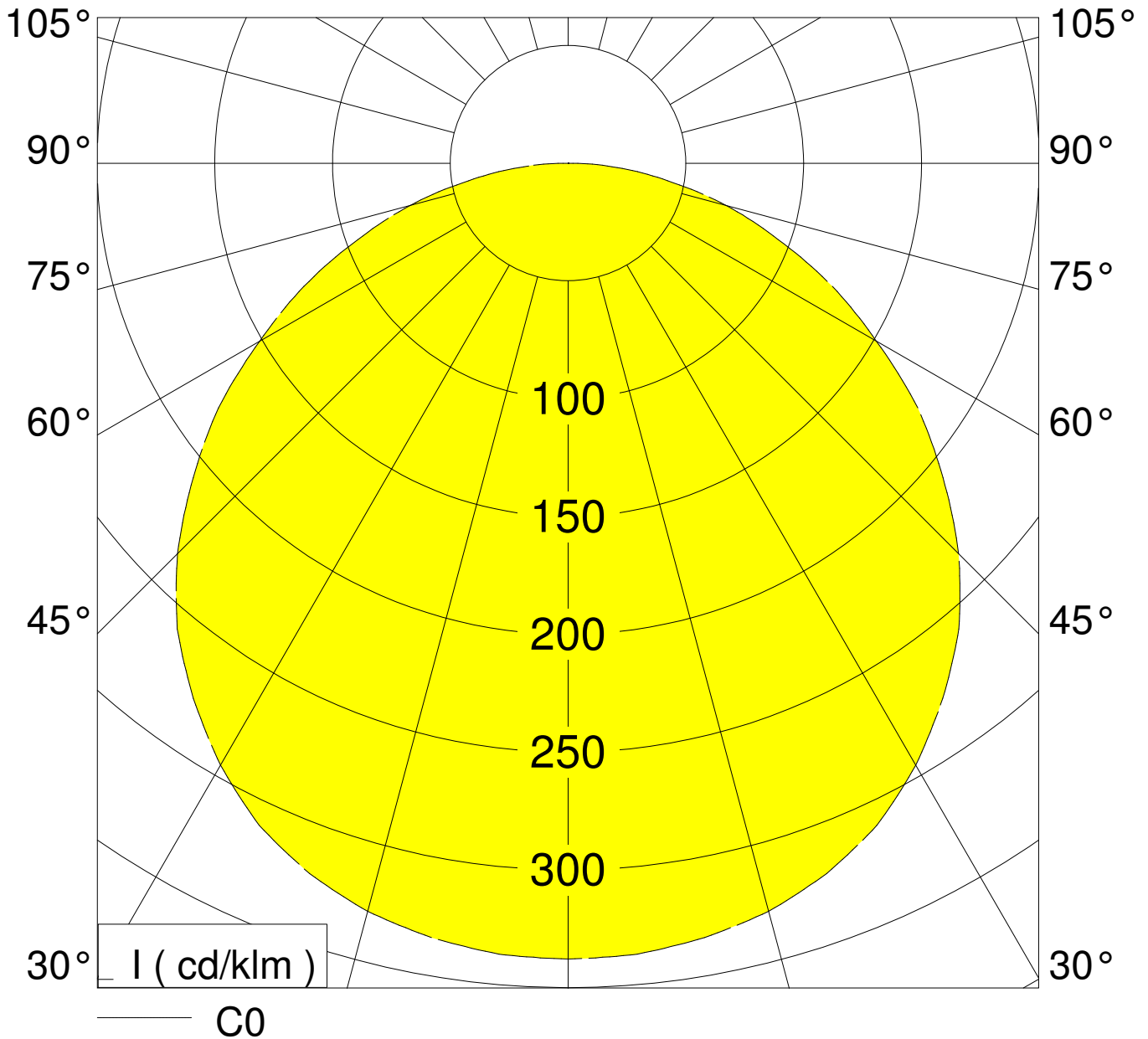
classification

LiTG / DIN : A40
UTE : 1.00D1.00E
CIE : 47 78 95 100 100
BZ : 5 5 5 5 5 5 5 5

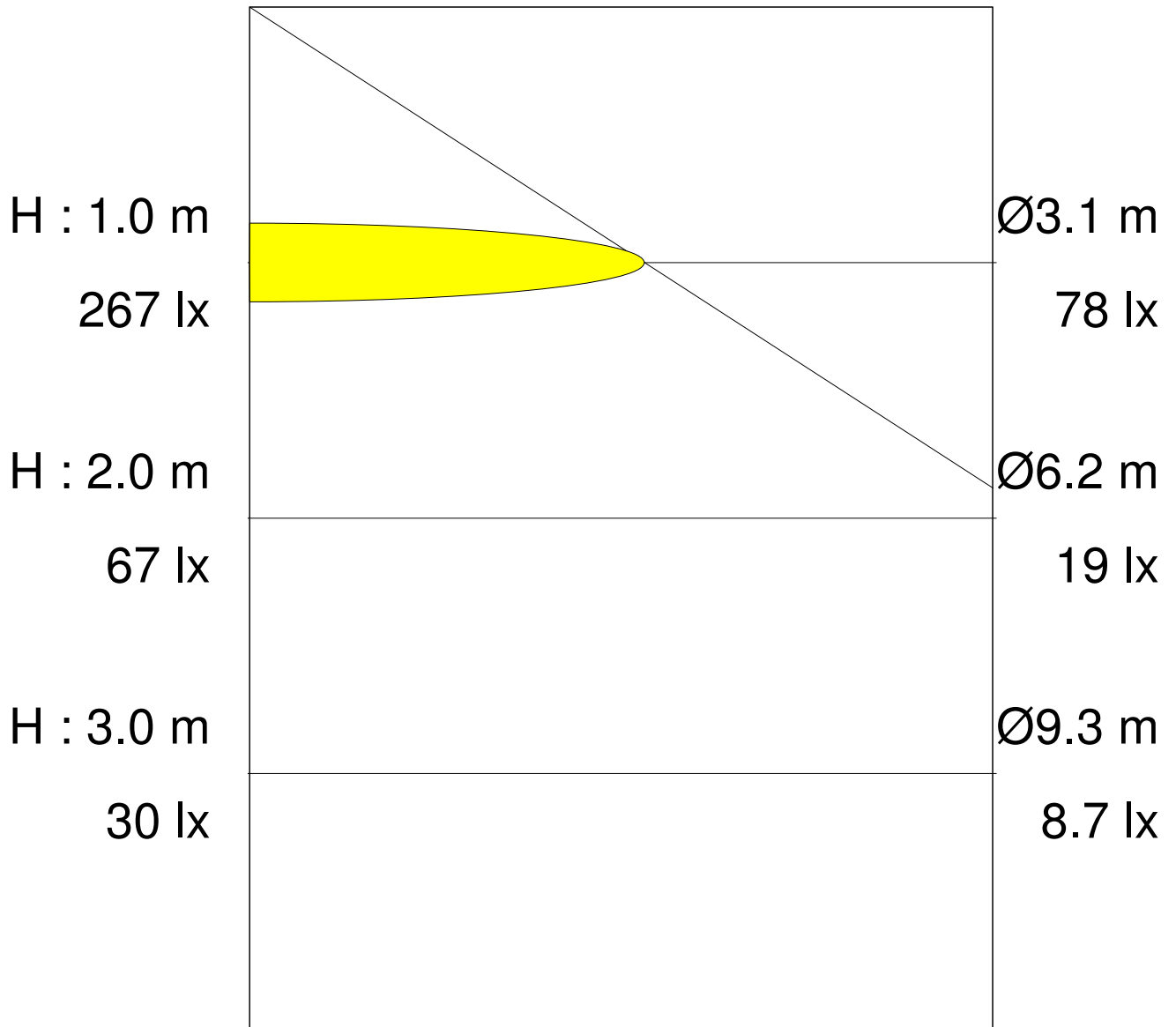
Ambient Temperature : 25 degC
Input Voltage : 240 V
Circuit Watts : 13.3W
Amps (running) : 0.057 A
V.A. : 13.71 VA
Power Factor : 0.97
CCT : 2830K (measured): 3000K (declared)
Luminaire Lumens : 790 lm
Output current DC : 350 mA
Output Voltage DC : 30.7 V
Output Power : 10.75 W
Luminaire Lm/CircWatt : 59.4 Lum Lm/circW
Driver Efficiency : 81%
Driver Details : OPTOTRONIC OTe 13/220-240-350PC



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 : 114.2°



	C 0.0
0.0°	337.60
5.0°	336.80
10.0°	333.60
15.0°	328.60
20.0°	320.70
25.0°	310.00
30.0°	294.90
35.0°	277.10
40.0°	257.90
45.0°	234.30
50.0°	207.60
55.0°	181.10
60.0°	151.00
65.0°	123.70
70.0°	94.90
75.0°	69.60
80.0°	42.80
85.0°	20.90
90.0°	0.00
95.0°	0.00
100.0°	0.00
105.0°	0.00
110.0°	0.00
115.0°	0.00
120.0°	0.00
125.0°	0.00
130.0°	0.00
135.0°	0.00
140.0°	0.00
145.0°	0.00
150.0°	0.00
155.0°	0.00
160.0°	0.00
165.0°	0.00
170.0°	0.00
175.0°	0.00
180.0°	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	23.6	25.1	23.9	25.3	25.5	23.6	25.1	23.9	25.3	25.5	
	3H	24.5	25.7	24.8	25.9	26.0	24.5	25.7	24.8	25.9	26.0	
	4H	25.3	26.4	25.5	26.6	26.8	25.3	26.4	25.5	26.6	26.8	
	6H	25.8	26.9	26.1	27.1	27.3	25.8	26.9	26.1	27.1	27.3	
	8H	26.0	27.1	26.3	27.3	27.6	26.0	27.1	26.3	27.3	27.6	
	12H	26.2	27.3	26.6	27.5	27.8	26.2	27.3	26.6	27.5	27.8	
4H	2H	23.7	24.8	24.0	25.0	25.2	23.7	24.8	24.0	25.0	25.2	
	3H	25.6	26.6	25.9	26.9	27.2	25.6	26.6	25.9	26.9	27.2	
	4H	26.5	27.6	26.9	27.8	28.1	26.5	27.6	26.9	27.8	28.1	
	6H	27.0	27.8	27.3	28.1	28.4	27.0	27.8	27.3	28.1	28.4	
	8H	27.3	28.1	27.7	28.4	28.7	27.3	28.1	27.7	28.4	28.7	
	12H	27.7	28.4	28.1	28.8	29.2	27.7	28.4	28.1	28.8	29.2	
8H	4H	26.7	27.5	27.1	27.8	28.2	26.7	27.5	27.1	27.8	28.2	
	6H	27.8	28.5	28.2	28.9	29.4	27.8	28.5	28.2	28.9	29.4	
	8H	28.3	29.0	28.7	29.4	29.9	28.3	29.0	28.7	29.4	29.9	
	12H	28.5	29.0	28.9	29.5	30.0	28.5	29.0	28.9	29.5	30.0	
12H	4H	26.9	27.7	27.4	28.1	28.5	26.9	27.7	27.4	28.1	28.5	
	6H	28.0	28.7	28.5	29.2	29.6	28.0	28.7	28.5	29.2	29.6	
	8H	28.3	28.9	28.8	29.3	29.8	28.3	28.9	28.8	29.3	29.8	
variation of observer position												
S =	1.0H	+0.1/			-0.1			+0.1/		-0.1		
	1.5H	+0.2/			-0.3			+0.2/		-0.3		
	2.0H	+0.4/			-0.5			+0.4/		-0.5		
standard-table	BK06					BK06						
correction for luminaire	10.8					10.8						
correct glare indices for a total flux of 790lm												

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	

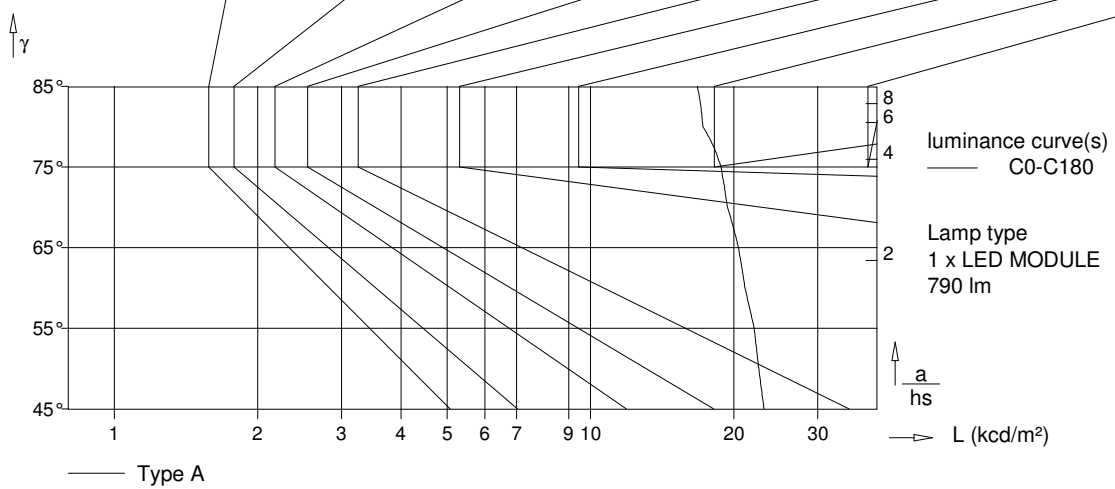


Tabelle der berechneten Leuchtdichten

gamma	C 0	C 90	C 180	C 270
45°	23145.3	23145.3	23145.3	23145.3
50°	22559.8	22559.8	22559.8	22559.8
55°	22054.7	22054.7	22054.7	22054.7
60°	21095.1	21095.1	21095.1	21095.1
65°	20445.4	20445.4	20445.4	20445.4
70°	19381.6	19381.6	19381.6	19381.6
75°	18784.0	18784.0	18784.0	18784.0
80°	17216.6	17216.6	17216.6	17216.6
85°	16750.4	16750.4	16750.4	16750.4

alle Werte in cd/m^2

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	56	66	74	79	86	91	95	100	103
70	30	20	48	58	66	72	80	86	90	95	99
70	10	20	42	52	60	66	75	81	85	92	96
50	50	20	54	64	71	76	83	88	91	96	98
50	30	20	47	57	65	70	78	83	87	92	95
50	10	20	42	52	59	65	73	79	83	89	93
30	50	20	53	62	69	74	80	85	88	92	95
30	30	20	46	56	63	68	76	81	84	89	92
30	10	20	41	51	59	64	72	77	81	86	90
0	0	0	39	49	56	61	68	73	77	82	85
BZ-class			5	5	5	5	5	5	5	5	5
SHRnom : 1.25						SHRmax : 1.489					

