



## Goniophotometric Test Report

### MEASUREMENT METHOD

The measurements were made by a goniophotometer of type LUMI 180. Goniometer was operated in horizontal axis. The DUT was rotated with 2-axis goniometer around the axes. The Luminous Intensity of the DUT at different directions were measured with a calibrated photometer located at a known far-field position of the DUT.

### MEASUREMENT UNCERTAINTY

The photometer of type SSL L200-004 is traceable to national standard at NIST (Certificate of calibration CR 0234 signed on 08.2021). The photometer head of type LH1010-003\_CR-0112 is traceable to national standard at PTB (Certificate of calibration CR 0112 signed on 01.2022).

The power meter of type is traceable to national standard at NIST.

The expanded uncertainties of the Luminous flux and efficacy are  $\pm 3.8\%$  and  $\pm 4.0\%$  ( $k = 2$ ), respectively.

### MEASUREMENTS

Table below describes the measurement conditions. The luminaire under test and photometer/spectrometer were mounted onto the same optical axis and perpendicular by an alignment laser. The measurement distance from the rotation axis to the photometer optical receiving surface was measured by laser distance meter.

Table - Measurement information

Ambient temperature of the laboratory	25.0 degC
Power supply	230.0 Vac
Measurement distance	8893 mm
Location of the rotation axis (behind the outermost surface of the optics)	0 mm
Angular step, C plane	2.5 deg
Angular step, gamma angle	2.5 deg
Maximum gamma angle	180.0 deg
Stabilization time	37 min

**Table. Luminous Intensity (cd) in horizontal (rows) and vertical planes (columns).**

	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0	32.5	35.0	37.5	40.0	42.5	45.0	47.5	50.0	52.5	55.0	57.5	60.0	62.5	65.0	67.5	70.0	72.5
0.0	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139
2.5	133	133	133	133	140	140	140	140	140	140	140	140	141	141	141	141	142	142	146	146	145	147	147	146	145	145	144	143	142	142
5.0	119	119	120	120	134	132	132	133	135	136	136	136	137	137	138	138	143	143	149	148	147	152	151	150	149	147	146	145	144	144
7.5	102	103	103	104	121	118	119	120	124	125	125	126	127	128	129	130	141	141	150	149	148	154	153	151	150	149	147	146	146	145
10.0	90	91	91	92	105	103	103	104	108	109	110	112	113	115	116	118	133	133	148	148	147	156	154	153	152	150	149	148	147	147
12.5	82	82	83	84	93	92	93	93	96	97	98	100	101	102	104	105	121	123	141	141	141	155	154	153	152	151	150	149	149	148
15.0	71	72	73	74	85	84	85	86	89	90	91	92	93	94	95	97	109	111	131	132	133	149	149	148	148	148	147	147	147	148
17.5	55	56	58	60	76	75	77	78	82	83	84	85	87	88	89	90	100	101	118	120	122	141	142	142	142	143	143	144	145	146
20.0	43	44	46	48	62	61	63	65	70	73	75	77	79	81	83	84	93	95	108	110	112	131	132	134	135	137	138	139	141	143
22.5	40	42	44	45	50	50	51	53	57	59	61	64	67	70	73	76	88	89	101	102	104	120	122	124	127	129	132	134	136	139
25.0	45	47	49	50	46	48	48	48	50	51	52	53	54	57	59	62	80	82	95	96	97	111	113	115	118	121	124	128	131	135
27.5	47	50	53	54	52	53	54	53	51	50	48	47	47	47	48	50	67	71	88	90	91	104	105	107	110	112	116	120	125	130
30.0	47	50	53	55	56	57	58	57	56	54	52	49	47	44	42	41	53	57	78	81	83	98	99	100	102	105	108	113	118	124
32.5	46	49	52	54	56	57	58	57	57	56	53	51	48	45	41	38	42	44	63	68	72	90	92	94	96	98	102	106	111	117
35.0	44	48	50	52	55	56	56	55	55	53	51	49	46	43	40	37	36	35	49	53	58	80	83	86	89	92	95	99	104	111
37.5	43	47	49	51	54	54	53	52	51	50	47	45	42	40	38	36	35	33	38	41	46	68	73	78	82	86	89	94	98	105
40.0	42	45	48	50	52	52	50	49	48	46	43	40	38	36	35	33	34	32	33	33	36	55	62	69	74	79	84	88	93	99
42.5	40	44	47	48	50	49	48	46	44	41	38	36	34	32	31	30	32	31	32	31	31	43	50	58	66	72	78	82	87	93
45.0	39	43	45	46	48	47	45	43	40	37	34	32	30	28	27	27	30	30	32	31	30	35	40	47	56	64	71	77	82	88
47.5	38	42	43	44	46	44	42	39	36	33	30	28	26	25	24	24	27	28	31	31	30	31	33	38	46	55	64	71	76	83
50.0	37	40	42	42	44	42	39	36	33	30	27	25	23	22	21	22	25	25	29	30	30	31	30	32	37	45	55	64	71	77
52.5	36	39	40	40	42	39	36	32	29	26	24	22	20	19	19	19	22	23	27	28	28	31	30	29	31	37	45	55	64	72
55.0	35	37	38	38	39	36	33	29	26	23	21	19	18	17	17	17	20	21	25	26	26	30	29	28	28	30	37	46	55	64
57.5	34	36	37	36	37	33	30	26	23	21	18	17	16	15	15	15	18	19	23	23	24	28	28	28	27	27	30	37	46	56
60.0	32	34	35	34	34	31	27	25	21	18	16	15	14	14	14	14	16	16	20	21	22	26	27	27	26	26	26	30	38	47
62.5	31	33	33	32	32	28	25	22	18	16	14	13	13	12	12	12	14	16	18	18	19	24	24	25	25	25	24	26	31	39
65.0	30	31	31	29	29	26	22	19	16	14	12	12	11	11	11	11	13	15	16	16	17	21	22	23	23	24	23	23	26	32
67.5	28	30	29	27	27	23	20	17	15	12	11	10	10	10	10	10	11	13	14	14	15	18	19	20	21	22	22	21	22	26
70.0	27	28	27	25	25	21	17	15	13	11	10	9	9	9	9	9	10	12	12	13	13	16	17	18	19	19	20	20	19	21
72.5	26	25	24	23	22	19	16	13	11	10	9	9	8	8	8	8	9	10	11	11	11	14	15	16	16	17	18	18	18	18
75.0	25	23	22	21	20	16	14	12	10	9	8	8	7	7	7	8	8	9	10	10	10	12	13	13	14	15	15	16	16	16
77.5	23	20	21	19	18	15	13	10	9	8	7	7	6	6	6	7	7	8	9	9	9	11	11	12	12	13	13	14	14	15
80.0	21	17	20	17	15	13	11	9	8	7	7	6	6	6	5	6	6	7	8	8	8	10	10	10	10	11	11	12	12	13
82.5	19	16	19	15	13	12	10	8	7	6	6	5	5	5	5	6	5	6	7	7	7	8	9	9	9	9	10	10	11	11
85.0	16	16	18	12	12	11	8	7	6	6	5	5	5	4	4	5	5	5	6	6	6	7	7	8	8	8	8	9	9	10
87.5	12	16	16	9	11	10	7	6	6	5	4	4	4	4	4	4	4	5	5	5	5	6	6	7	7	7	7	7	8	8
90.0	9	17	15	7	11	9	6	6	6	5	4	4	4	3	3	4	4	4	4	4	4	5	5	6	6	6	6	6	6	7
92.5	8	16	14	7	10	8	5	6	5	4	4	4	3	3	3	3	3	3	4	4	4	5	5	5	5	5	5	5	6	6
95.0	9	15	12	8	10	8	5	6	5	4	4	4	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	5	5
97.5	10	14	10	8	9	7	5	5	5	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4
100.0	10	12	8	8	8	6	5	5	4	4	4	3	3	3	3	3	2	2	2	2	2	3	3	3	3	3	3	3	3	3
102.5	10	11	7	8	8	5	5	4	4	4	4	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3
105.0	10	9	7	7	7	5	5	5	4	4	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
107.5	9	8	7	6	6	5	5	4	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
110.0	8	7	6	6	6	5	5	4	4	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
112.5	7	7	6	5	5	5	4	4	4	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
115.0	6	6	5	5	5	5	4	4	4	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1
117.5	6	6	5	5	5	4	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
120.0	5	5	5	5	5	4	4	4	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1
122.5	5	5	5	5	4	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1
125.0	5	5	4	4	4	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1
127.5	4	4	4	4	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1
130.0	4	4	4	4	4	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1
132.5	4	4	4	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1
135.0	4	4	4	4	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
137.5	4	4	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	2	2
140.0	4	3	3	3	3	3	3	3																						

150.0	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	4	3	2	2	2	1
152.5	4	4	3	3	3	3	3	3	2	2	2	2	3	3	3	2	3	2	2	3	3	3	4	4	3	2	2	2	1	1
155.0	5	5	5	3	3	4	4	3	3	4	4	4	4	4	4	4	3	4	4	3	4	3	2	2	2	2	2	2	1	1
157.5	4	4	4	5	5	4	4	4	4	4	4	3	3	3	2	3	3	4	3	3	2	3	2	2	2	2	2	2	1	1
160.0	3	3	3	4	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1
162.5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1
165.0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
167.5	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1
170.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
172.5	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
175.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
177.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1
180.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0

	122.5	125.0	127.5	130.0	132.5	135.0	137.5	140.0	142.5	145.0	147.5	150.0	152.5	155.0	157.5	160.0	162.5	165.0	167.5	170.0	172.5	175.0	177.5	180
0.0	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139
2.5	153	154	156	157	154	156	157	158	158	159	160	160	160	161	161	162	162	162	162	162	162	162	162	139
5.0	165	167	170	172	166	168	170	172	173	175	176	175	177	178	179	179	180	181	181	181	182	182	182	134
7.5	175	178	181	184	174	176	179	181	183	185	187	184	186	187	188	189	190	191	192	192	192	192	192	124
10.0	180	184	188	192	175	177	180	182	184	186	188	184	186	187	189	189	191	191	192	192	192	192	192	107
12.5	181	185	189	193	176	178	180	182	184	186	188	182	183	184	185	185	186	186	187	186	187	186	187	92
15.0	183	186	191	194	171	173	174	175	177	178	179	172	173	173	173	173	174	173	174	173	173	173	173	83
17.5	182	185	188	191	164	165	165	166	166	166	166	156	156	155	155	154	154	153	152	151	151	150	150	74
20.0	176	179	181	183	153	152	151	150	149	148	147	137	137	136	135	134	134	133	132	131	131	130	130	60
22.5	170	171	172	172	138	136	135	134	133	132	131	124	123	123	122	122	121	120	120	119	118	117	116	46
25.0	160	159	159	157	125	124	123	122	121	121	121	115	115	114	114	113	112	111	110	108	107	106	104	41
27.5	148	146	144	142	115	114	114	113	113	113	112	106	105	104	102	101	99	97	95	92	90	88	86	45
30.0	135	133	131	130	106	106	106	105	104	103	101	88	90	88	86	83	81	78	76	74	72	69	67	47
32.5	123	122	121	120	97	96	95	92	90	87	84	79	74	72	71	70	69	67	66	64	63	61	59	46
35.0	114	112	111	110	85	81	78	74	72	69	68	65	63	65	68	70	72	72	72	71	69	67	64	44
37.5	105	103	101	98	69	64	60	57	56	56	59	61	66	70	73	76	78	79	79	77	75	72	69	42
40.0	96	92	88	83	54	49	46	47	51	55	60	63	68	72	76	78	79	79	79	77	75	72	68	41
42.5	86	80	73	66	41	40	43	46	50	54	59	62	66	69	72	74	76	77	77	75	73	70	66	39
45.0	74	66	58	51	38	40	42	45	49	52	55	57	60	64	68	70	72	74	74	73	71	68	64	37
47.5	61	53	46	41	38	39	41	43	45	47	50	51	54	58	62	66	69	70	71	70	69	66	61	36
50.0	49	42	39	41	37	38	38	39	40	42	44	46	48	52	57	61	64	67	68	68	66	64	59	35
52.5	39	38	39	41	36	35	35	35	36	37	39	41	43	47	51	56	60	63	65	65	64	62	57	34
55.0	36	37	39	40	33	32	32	32	32	33	34	36	38	42	46	51	56	60	62	63	62	59	55	33
57.5	35	37	37	37	30	29	29	28	28	29	30	31	34	37	42	47	52	56	59	60	59	57	54	31
60.0	34	35	35	34	27	26	26	25	25	25	26	27	29	33	37	42	47	52	56	57	57	55	52	30
62.5	32	32	31	31	24	23	23	22	22	22	23	24	26	29	33	38	43	48	52	54	55	53	50	29
65.0	29	29	28	27	21	20	20	20	20	20	21	21	23	26	30	34	39	44	49	51	52	51	48	28
67.5	26	25	24	24	18	18	18	18	18	18	18	19	20	23	27	31	35	41	45	48	50	50	47	26
70.0	23	22	21	21	16	16	16	16	16	16	16	17	18	20	23	28	32	37	42	45	47	47	45	25
72.5	20	19	19	18	14	14	14	14	14	14	14	15	16	17	20	25	29	33	39	42	44	45	43	24
75.0	17	17	16	16	12	12	12	12	12	13	13	13	14	15	18	22	26	30	35	39	41	43	41	22
77.5	15	14	14	14	11	11	11	11	11	11	12	12	12	14	16	19	24	27	32	36	38	40	39	21
80.0	13	13	12	12	9	10	9	10	10	10	11	10	11	12	14	17	21	25	28	33	36	37	37	18
82.5	11	11	11	11	8	8	8	8	9	9	10	9	10	11	12	15	18	22	26	29	33	35	34	16
85.0	10	10	9	9	7	7	7	7	8	8	8	9	9	10	11	13	16	20	24	26	30	34	31	13
87.5	8	8	8	8	6	6	7	7	7	7	7	8	8	9	10	12	14	17	22	23	26	32	28	11
90.0	7	7	7	7	6	5	6	6	6	6	6	7	7	7	9	10	12	15	20	21	22	30	27	10
92.5	6	6	6	6	5	5	5	5	5	6	6	6	6	7	8	9	11	12	18	20	18	28	27	11
95.0	5	5	5	5	4	4	4	4	4	5	5	5	6	6	7	8	10	10	16	19	15	25	27	13
97.5	4	4	4	4	3	4	3	4	4	4	5	5	5	6	6	8	9	9	14	18	13	22	26	14
100.0	4	4	4	4	3	3	3	3	4	4	4	4	5	5	6	7	9	9	12	17	14	19	25	14
102.5	3	3	3	3	3	3	3	3	3	3	4	4	4	5	5	6	8	8	9	16	15	15	23	13
105.0	2	3	3	3	2	3	3	3	3	3	4	4	4	5	5	6	8	8	8	14	15	11	21	12
107.5	2	2	2	3	2	3	3	3	3	3	3	4	4	5	5	6	7	8	7	13	15	9	20	11
110.0	2	2	2	2	2	2	3	3	3	3	3	4	4	4	5	5	7	8	7	12	14	9	17	10
112.5	2	2	2	2	2	2	3	3	3	3	3	4	4	4	5	5	6	7	7	10	13	10	14	8
115.0	2	2	2	2	2	2	2	3	3	3	3	3	4	4	5	5	6	7	7	8	12	10	12	7
117.5	2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	5	5	6	7	8	10	10	11	6
120.0	2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	5	5	6	6	7	9	9	10	6
122.5	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	5	5	6	6	7	8	9	9	5
125.0	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	5	5	6	6	7	8	9	5
127.5	2	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	5	5	5	6	7	7	8	5
130.0	2	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	5	5	6	6	6	7	4
132.5	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	5	5	5	6	6	7	4
135.0	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	4	4	4	5	5	5	6	6	4
137.5	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	4	4	4	5	5	5	6	4
140.0	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	4	4	4	5	5	5	6	4
142.5	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	4	4	4	4	5	5	5	3
145.0	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	3
147.5	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	5	3
150.0	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	5	3
152.5	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4
155.0	5	3	3	2	3	3	3	2	2	2	3	2	3	3	3	3	3	3	3	4	4	4	4	4

<b>157.5</b>	7	6	5	4	5	4	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	7
<b>160.0</b>	6	7	7	7	7	7	6	6	5	4	4	3	4	4	4	4	4	4	4	4	4	5	6
<b>162.5</b>	4	5	6	7	5	6	7	7	8	7	7	6	6	6	6	5	5	5	5	5	5	6	4
<b>165.0</b>	2	3	4	5	3	4	5	6	6	7	8	8	8	8	8	8	8	9	9	9	9	9	2
<b>167.5</b>	2	2	2	3	2	2	3	3	4	4	5	5	5	6	6	7	7	7	8	8	8	8	2
<b>170.0</b>	2	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	5	5	5	5	1
<b>172.5</b>	1	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	1
<b>175.0</b>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	0
<b>177.5</b>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	0
<b>180.0</b>	1	1	1	1	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	1	1	1	0

	242.5	245.0	247.5	250.0	252.5	255.0	257.5	260.0	262.5	265.0	267.5	270.0	272.5	275.0	277.5	280.0	282.5	285.0	287.5	290.0	292.5	295.0	297.5	300
0.0	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139
2.5	133	133	134	135	136	136	137	137	136	136	136	136	136	135	135	134	133	133	132	131	129	128	127	126
5.0	125	126	127	127	126	126	125	123	122	121	120	120	120	119	118	117	117	117	117	117	117	116	115	114
7.5	110	109	107	105	103	102	101	100	98	97	96	96	95	95	94	92	93	93	93	93	94	96	97	100
10.0	92	90	86	84	81	79	78	77	75	73	72	72	72	71	71	69	69	70	71	72	74	77	81	85
12.5	80	76	72	65	61	59	56	54	52	50	49	49	49	49	49	48	49	50	52	55	59	66	74	80
15.0	78	73	66	59	48	43	39	35	30	27	25	25	25	27	28	29	31	34	38	46	57	67	71	69
17.5	70	72	66	56	45	32	25	18	12	7	6	5	6	8	11	14	18	25	34	47	59	60	58	55
20.0	61	62	63	56	44	30	21	17	13	8	5	6	7	8	10	13	16	21	37	50	51	49	46	43
22.5	53	54	54	55	46	38	27	22	16	9	6	6	8	10	13	16	21	28	41	43	42	40	37	34
25.0	43	47	47	47	48	42	36	27	19	10	5	6	8	11	15	21	27	35	37	36	34	32	29	28
27.5	34	38	40	41	41	41	38	33	23	12	5	6	9	13	19	25	29	31	30	29	27	25	25	27
30.0	26	29	32	34	34	34	31	27	18	9	4	4	7	10	16	19	23	25	24	23	22	22	24	25
32.5	21	22	24	26	28	27	24	19	13	5	1	1	3	5	9	14	19	19	18	18	19	21	22	23
35.0	20	18	18	19	21	21	19	14	9	3	1	1	1	3	6	12	14	14	13	16	18	19	20	21
37.5	18	17	15	14	15	15	14	10	7	2	1	1	1	3	5	9	10	9	11	14	16	17	17	18
40.0	16	15	14	12	10	10	9	7	5	2	1	1	1	2	4	7	6	8	10	13	14	15	15	15
42.5	13	13	12	11	8	6	6	4	3	2	1	1	1	2	3	4	5	7	9	11	12	12	13	13
45.0	11	11	10	9	8	6	4	3	3	2	1	1	1	2	3	4	4	6	8	10	10	11	11	11
47.5	9	9	9	8	7	5	4	3	2	1	0	1	1	2	2	3	4	5	7	8	9	9	9	9
50.0	8	8	7	6	6	4	3	2	2	1	0	0	1	1	2	3	3	4	6	7	7	8	8	8
52.5	7	7	6	5	5	4	3	2	1	1	0	0	0	1	2	2	3	4	5	6	6	6	7	7
55.0	6	6	5	4	4	3	2	2	1	1	0	0	0	1	1	2	2	3	4	5	5	5	6	6
57.5	5	5	4	4	3	2	2	1	1	0	0	0	0	1	1	1	2	3	3	4	4	4	5	5
60.0	4	4	3	3	2	2	1	1	1	0	0	0	0	0	1	1	1	2	3	3	3	4	4	4
62.5	3	3	3	2	2	1	1	1	0	0	0	0	0	0	1	1	1	1	2	2	3	3	3	4
65.0	3	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	3	3
67.5	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	3
70.0	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2
72.5	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2
75.0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2
77.5	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2
80.0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2
82.5	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2
85.0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2
87.5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2
90.0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2
92.5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2
95.0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2
97.5	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2
100.0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2
102.5	1	1	1	1	1	2	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2
105.0	1	1	1	1	2	2	1	0	0	0	0	0	0	0	1	1	1	2	1	1	1	1	1	2
107.5	1	1	1	1	3	2	1	1	0	0	0	0	0	0	1	1	1	2	2	1	1	1	1	2
110.0	1	1	1	3	3	2	1	1	0	0	0	0	0	0	1	1	1	1	2	2	1	1	1	2
112.5	1	1	2	3	3	1	1	1	0	0	0	0	0	0	1	1	1	1	2	3	2	2	2	2
115.0	1	2	3	3	2	1	1	1	0	0	0	0	0	0	1	1	1	1	1	2	3	2	2	2
117.5	2	3	4	3	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	2	3	3	2	2
120.0	3	5	4	2	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	2	3	4	2
122.5	5	4	3	2	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	2	3	4	4
125.0	5	4	2	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	2	2	3	4
127.5	4	3	2	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	2	2	2	3
130.0	3	2	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2
132.5	2	2	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2
135.0	2	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2
137.5	2	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2
140.0	2	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2
142.5	2	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2
145.0	2	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2
147.5	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2
150.0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2
152.5	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2
155.0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1

157.5	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
160.0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
162.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
167.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
180.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1

Table. Measurement results of the main luminous parameters

Luminous flux	Input power	Luminous efficacy	LOR	DWFF	Luminous intensity (g=0)
225.4 lm	7.30 W	30.9 lm/W	100.0 %	91.0 %	141 cd

Table. Electrical parameters during the light measurements.

	Pin	PF	Vin	If
Value	7.279 W	0.4190	230.0 V	0.0750 A
St.dev.	0.07 %	0.00 %	0.00 %	0.00 %

Table. Maximum Luminous Intesity and its direction

Iv	g	C plane
194 cd	15.0°	130.0°

Table. Beam widths at two perpendicular planes

	Beam angle, FWHM, 50% (deg)	Beam angle, 10% (deg)	Effective beam direction from g=0
C0-180	33.3°	170.8°	-0.8°
C90-270	76.4°	97.5°	28.7°

Figure. Polar curve of the angular Luminous Intesity distribution at two perpendicular C planes and at C plane with maximum Luminous Intesity.

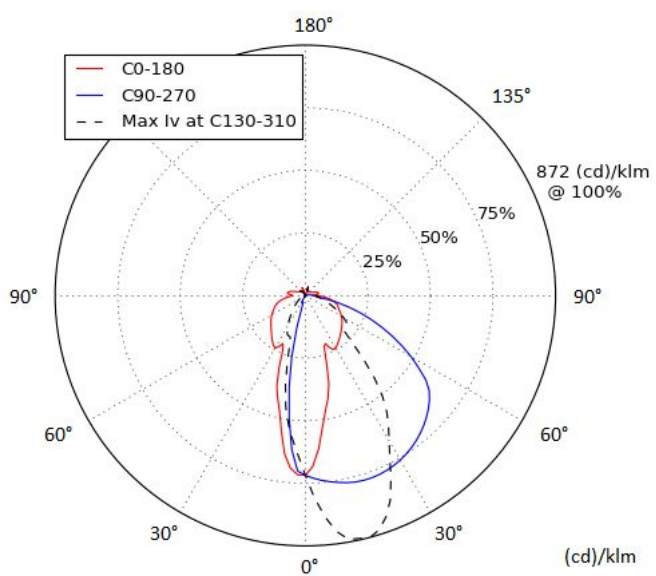




Figure. Luminous Intesity distribution in cartesian diagram at all measured C planes.

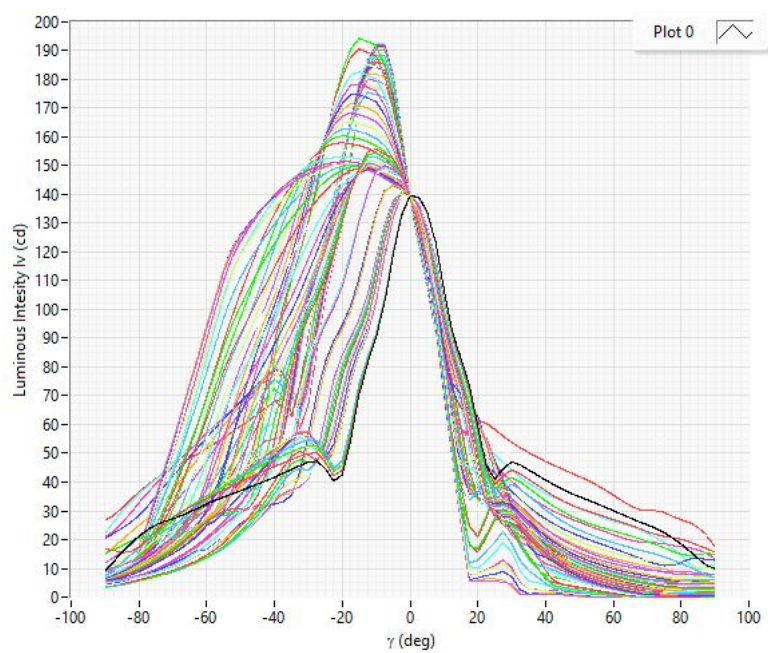
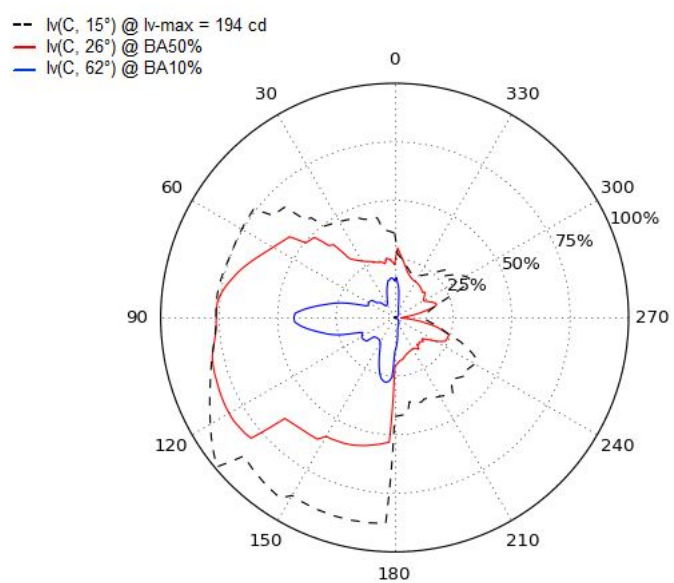


Figure. Isocandela as a function of C plane at gamma angle with maximum luminous intensity



**Table. Zonal lumen summary**

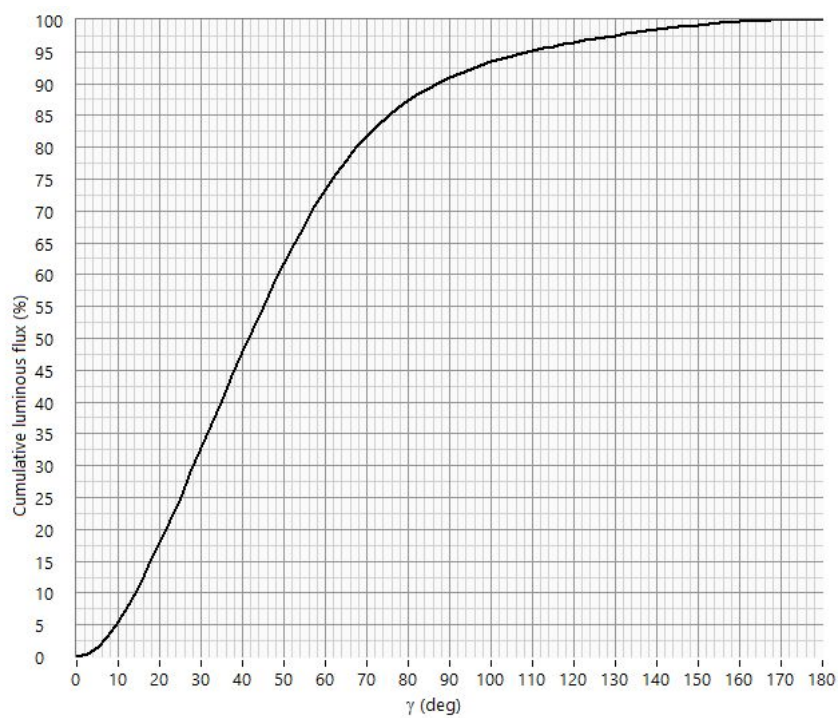
	<b>Lumens</b>	<b>Relative lumens (%)</b>
<b>0-20</b>	40.30	17.88
<b>0-30</b>	73.80	32.74
<b>0-40</b>	107.90	47.87
<b>0-60</b>	165.30	73.34
<b>0-80</b>	196.90	87.36
<b>0-90</b>	205.00	90.95
<b>10-90</b>	192.70	85.49
<b>20-40</b>	67.60	29.99
<b>20-50</b>	98.90	43.88
<b>40-70</b>	76.40	33.90
<b>40-90</b>	97.10	43.08
<b>60-80</b>	31.60	14.02
<b>60-90</b>	39.70	17.61
<b>70-80</b>	12.60	5.59
<b>80-90</b>	8.10	3.59
<b>90-110</b>	9.40	4.17
<b>90-120</b>	12.40	5.50
<b>90-130</b>	14.90	6.61
<b>90-150</b>	18.60	8.25
<b>90-180</b>	20.40	9.05
<b>110-180</b>	11.00	4.88
<b>0-180</b>	225.40	100.00

**Table. Cumulative and Zonal luminous flux**

gamma (deg)	Zone Flux (lm)	Sum Flux (lm)	Zone Flux (%)	Sum Flux (%)
0.0	0.0	0.0	0.0	0.0
2.5	1.7	0.8	0.7	0.4
5.0	3.2	3.3	1.4	1.5
7.5	4.6	7.2	2.0	3.2
10.0	5.6	12.3	2.5	5.5
12.5	6.5	18.4	2.9	8.2
15.0	7.1	25.2	3.2	11.2
17.5	7.6	32.5	3.4	14.4
20.0	7.9	40.3	3.5	17.9
22.5	8.1	48.3	3.6	21.4
25.0	8.4	56.6	3.7	25.1
27.5	8.7	65.1	3.8	28.9
30.0	8.7	73.8	3.9	32.7
32.5	8.6	82.4	3.8	36.6
35.0	8.5	91.0	3.8	40.4
37.5	8.5	99.5	3.7	44.1
40.0	8.3	107.9	3.7	47.9
42.5	8.1	116.1	3.6	51.5
45.0	7.9	124.1	3.5	55.0
47.5	7.6	131.8	3.4	58.5
50.0	7.3	139.2	3.2	61.8
52.5	6.9	146.3	3.1	64.9
55.0	6.6	153.1	2.9	67.9
57.5	6.1	159.4	2.7	70.7
60.0	5.7	165.3	2.5	73.3
62.5	5.2	170.7	2.3	75.7
65.0	4.8	175.7	2.1	78.0
67.5	4.3	180.2	1.9	80.0
70.0	3.9	184.3	1.7	81.8
72.5	3.5	188.0	1.6	83.4
75.0	3.1	191.4	1.4	84.9
77.5	2.8	194.3	1.2	86.2
80.0	2.5	196.9	1.1	87.4
82.5	2.2	199.3	1.0	88.4
85.0	2.0	201.4	0.9	89.3
87.5	1.8	203.3	0.8	90.2
90.0	1.6	205.0	0.7	91.0
92.5	1.5	206.6	0.7	91.7
95.0	1.4	208.0	0.6	92.3
97.5	1.3	209.3	0.6	92.9
100.0	1.1	210.5	0.5	93.4
102.5	1.0	211.6	0.5	93.9
105.0	1.0	212.6	0.4	94.3
107.5	0.9	213.5	0.4	94.8
110.0	0.8	214.4	0.4	95.1
112.5	0.8	215.2	0.4	95.5
115.0	0.7	216.0	0.3	95.8
117.5	0.7	216.7	0.3	96.2
120.0	0.7	217.4	0.3	96.5
122.5	0.6	218.1	0.3	96.8
125.0	0.6	218.7	0.3	97.0
127.5	0.6	219.3	0.3	97.3
130.0	0.6	219.9	0.2	97.6
132.5	0.5	220.4	0.2	97.8
135.0	0.5	220.9	0.2	98.0
137.5	0.5	221.4	0.2	98.3
140.0	0.5	221.9	0.2	98.5
142.5	0.4	222.3	0.2	98.7
145.0	0.4	222.8	0.2	98.8

147.5	0.4	223.2	0.2	99.0
150.0	0.4	223.6	0.2	99.2
152.5	0.3	223.9	0.1	99.4
155.0	0.3	224.2	0.1	99.5
157.5	0.3	224.5	0.1	99.6
160.0	0.2	224.8	0.1	99.7
162.5	0.2	225.0	0.1	99.8
165.0	0.1	225.1	0.1	99.9
167.5	0.1	225.2	0.0	99.9
170.0	0.1	225.3	0.0	100.0
172.5	0.0	225.3	0.0	100.0
175.0	0.0	225.4	0.0	100.0
177.5	0.0	225.4	0.0	100.0
180.0	0.0	225.4	0.0	100.0

Figure. Cumulative luminous flux



**Table. Luminance at different angles based on the defined luminous areas and measured luminous intensities.**

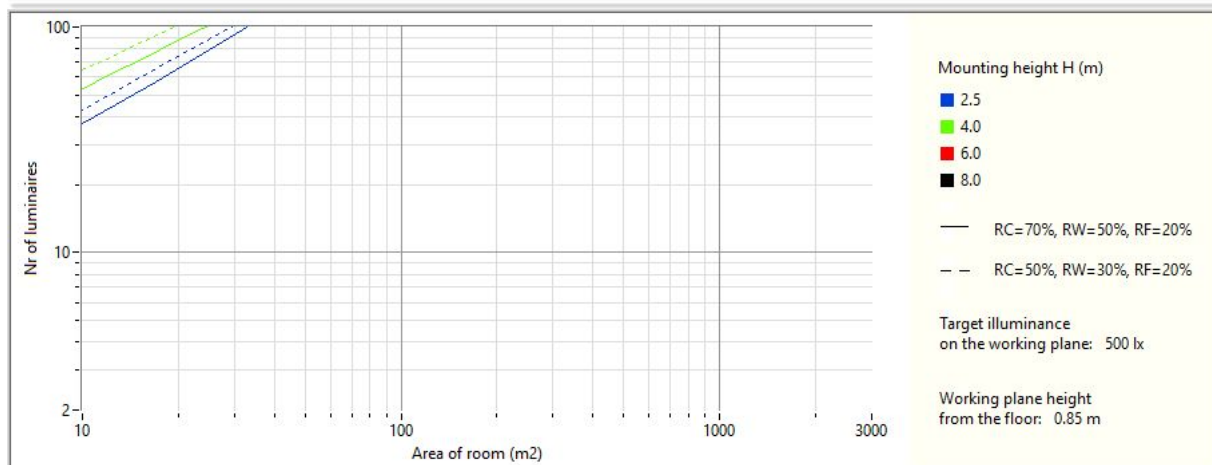
	<b>C 0</b>	<b>C 45</b>	<b>C 90</b>
<b>g 0</b>	24149	24149	24149
<b>g 45</b>	9620	7809	32589
<b>g 55</b>	10515	7555	34485
<b>g 65</b>	12148	6507	30474
<b>g 75</b>	16813	6437	23647
<b>g 85</b>	31200	11302	16162

UGR table

Ceiling		70	70	50	50	30		70	70	50	50	30
Walls		50	30	50	30	30		50	30	50	30	30
Floor		20	20	20	20	20		20	20	20	20	20
Room size		Viewing direction at right angles to lamp axis						Viewing direction parallel to lamp axis				
X	Y											
2H	2H	18.1	19.4	18.6	19.9	20.4		24.4	25.7	24.9	26.2	26.7
	3H	21.3	22.6	21.9	23.1	23.7		26.4	27.6	26.9	28.1	28.7
	4H	22.9	24.1	23.4	24.6	25.2		27.2	28.4	27.8	28.9	29.5
	6H	24.6	25.7	25.1	26.2	26.8		27.8	28.8	28.3	29.4	30.0
	8H	25.4	26.5	26.0	27.0	27.6		27.9	29.0	28.5	29.5	30.1
	12H	26.3	27.3	26.9	27.8	28.5		28.1	29.1	28.7	29.6	30.3
4H	2H	18.4	19.6	19.0	20.1	20.7		24.3	25.5	24.8	26.0	26.6
	3H	21.5	22.5	22.1	23.0	23.6		26.5	27.5	27.1	28.1	28.7
	4H	23.0	23.9	23.6	24.5	25.1		27.4	28.3	28.0	28.9	29.5
	6H	24.8	25.6	25.4	26.2	26.9		28.1	28.9	28.7	29.5	30.2
	8H	25.9	26.6	26.5	27.2	27.9		28.4	29.2	29.0	29.7	30.4
	12H	26.9	27.6	27.5	28.2	28.9		28.7	29.3	29.3	30.0	30.6
8H	4H	23.2	23.9	23.8	24.5	25.2		27.5	28.2	28.1	28.8	29.5
	6H	25.0	25.6	25.6	26.2	26.9		28.3	28.9	28.9	29.6	30.2
	8H	26.0	26.6	26.7	27.2	27.9		28.7	29.3	29.4	29.9	30.6
	12H	27.2	27.7	27.9	28.4	29.1		29.2	29.7	29.8	30.3	31.1
12H	4H	23.3	23.9	23.9	24.6	25.2		27.5	28.1	28.1	28.8	29.4
	6H	25.0	25.6	25.7	26.2	26.9		28.3	28.9	29.0	29.5	30.2
	8H	26.1	26.6	26.7	27.2	28.0		28.8	29.3	29.4	29.9	30.7

CU table

RC	80				70				50			30			10		
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10
RF / RCR	20				20				20			20			20		
0	117	117	117	117	113	113	113	113	106	106	106	100	100	100	94	94	94
1	90	86	83	80	90	86	83	80	86	84	81	87	84	82	87	85	83
2	86	79	74	69	85	79	74	69	78	74	70	77	74	70	77	74	71
3	81	72	66	60	80	72	66	61	71	65	61	70	65	61	69	65	61
4	76	66	59	54	75	66	59	54	64	58	54	63	58	54	62	57	54
5	72	61	53	48	70	60	53	48	59	53	48	58	52	48	56	51	48
6	68	56	49	43	66	56	48	43	54	48	43	53	47	43	52	47	43
7	64	52	44	39	62	51	44	39	50	44	39	49	43	39	48	43	39
8	60	48	41	36	59	48	41	36	47	40	36	45	40	35	44	39	35
9	57	45	38	33	56	44	38	33	43	37	33	42	37	32	41	36	32
10	54	42	35	31	53	42	35	30	41	34	30	40	34	30	39	34	30





WEC table

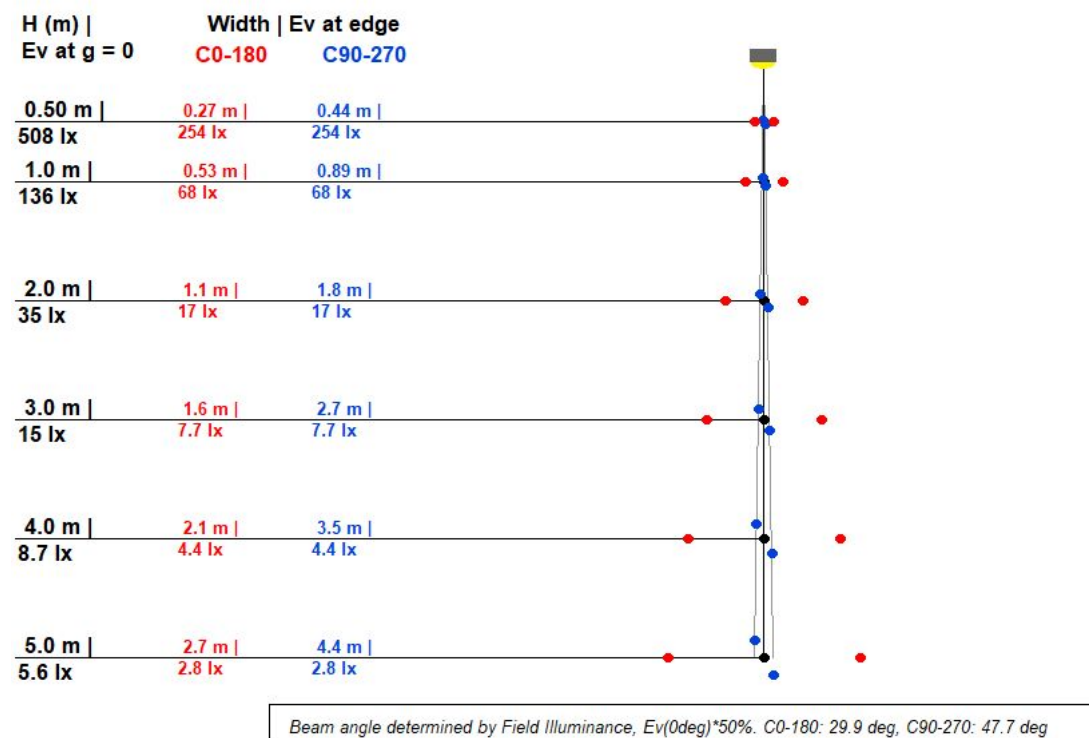
RC	80				70				50			30			10		
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10
RF / RCR	20				20				20			20			20		
1	46.7	31.7	18.1	5.8	45.2	30.8	17.6	5.6	28.8	16.6	5.3	26.8	15.5	5.0	24.6	14.3	4.6
2	44.5	29.1	16.1	5.0	43.0	28.2	15.7	4.9	26.4	14.8	4.6	24.5	13.8	4.3	22.5	12.7	4.0
3	42.4	26.9	14.6	4.4	40.9	26.1	14.2	4.3	24.4	13.4	4.1	22.6	12.5	3.9	20.7	11.5	3.6
4	40.5	25.0	13.3	4.0	38.9	24.2	12.9	3.9	22.6	12.2	3.7	20.9	11.4	3.5	19.1	10.4	3.2
5	38.7	23.4	12.3	3.7	37.2	22.6	11.9	3.6	21.1	11.2	3.4	19.5	10.4	3.1	17.8	9.6	2.9
6	37.0	22.0	11.4	3.4	35.5	21.3	11.1	3.3	19.8	10.4	3.1	18.3	9.6	2.9	16.6	8.8	2.6
7	35.5	20.8	10.7	3.2	34.1	20.1	10.4	3.1	18.7	9.7	2.9	17.2	9.0	2.7	15.6	8.2	2.4
8	34.1	19.8	10.1	3.0	32.7	19.1	9.8	2.9	17.7	9.1	2.7	16.2	8.4	2.5	14.7	7.6	2.2
9	32.8	18.8	9.6	2.8	31.5	18.2	9.3	2.7	16.8	8.6	2.5	15.4	7.9	2.3	13.9	7.1	2.1
10	31.6	18.0	9.2	2.7	30.3	17.4	8.9	2.6	16.0	8.2	2.4	14.6	7.5	2.2	13.2	6.7	1.9

CCEC table

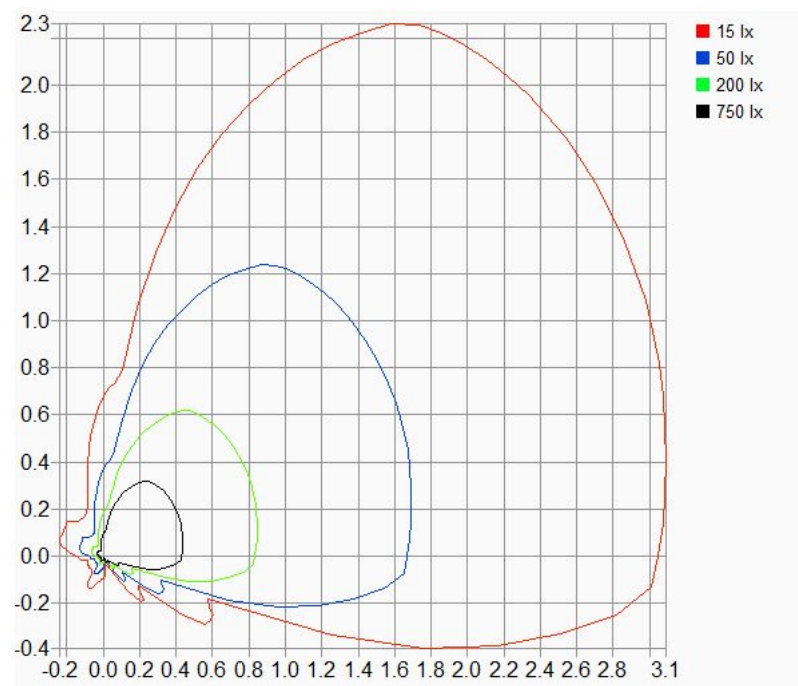
RC	80				70				50			30			10		
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10
RF / RCR	20				20				20			20			20		
1	104.4	96.6	89.6	83.2	43.1	39.2	35.7	32.5	14.1	12.6	11.2	6.8	6.0	5.3	2.1	1.8	1.6
2	102.0	88.1	76.6	66.9	42.9	35.9	30.1	25.2	13.2	10.6	8.4	6.4	5.2	4.1	2.0	1.6	1.3
3	98.7	80.0	65.6	54.0	42.1	32.8	25.5	19.6	12.3	9.1	6.4	6.1	4.5	3.2	1.9	1.4	1.0
4	94.6	72.4	56.1	43.6	40.8	29.8	21.6	15.2	11.4	7.8	4.9	5.7	4.0	2.5	1.8	1.3	0.9
5	90.1	65.2	47.8	35.0	39.3	26.9	18.1	11.6	10.5	6.6	3.6	5.4	3.5	2.0	1.7	1.2	0.7
6	85.3	58.5	40.6	27.7	37.6	24.2	15.1	8.5	9.7	5.7	2.7	5.1	3.1	1.6	1.6	1.1	0.6
7	80.4	52.4	34.2	21.4	35.7	21.7	12.5	5.9	8.9	4.8	1.8	4.8	2.8	1.3	1.6	1.0	0.5
8	75.6	46.7	28.5	16.1	33.8	19.4	10.2	3.7	8.2	4.1	1.2	4.5	2.5	1.0	1.5	0.9	0.5
9	70.9	41.5	23.6	11.4	32.0	17.3	8.1	1.8	7.5	3.4	0.6	4.2	2.2	0.8	1.4	0.8	0.4
10	66.4	36.8	19.1	7.4	30.1	15.3	6.3	0.2	6.9	2.9	0.1	3.9	2.0	0.6	1.3	0.8	0.3

# CONE DIAGRAM

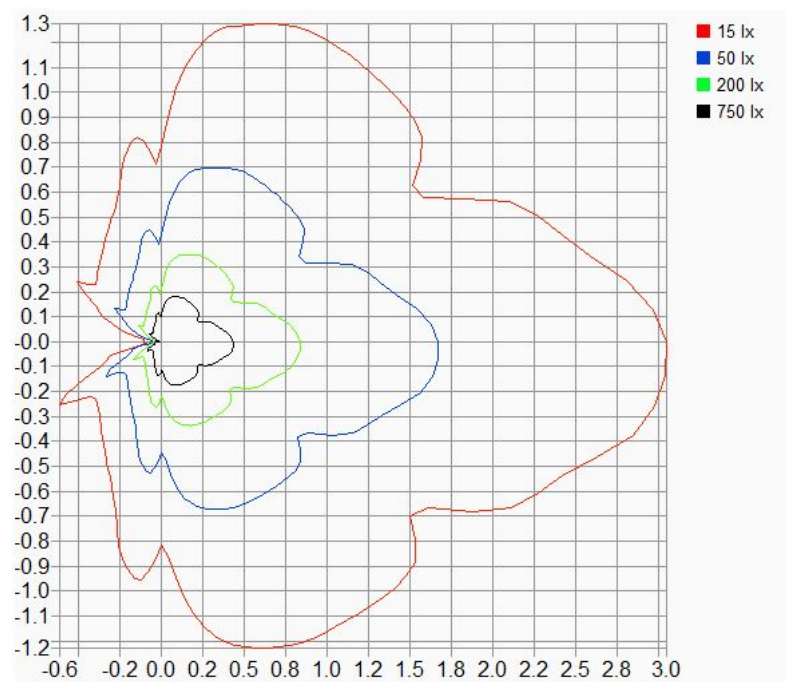
- Cone is limited by the beam angle at the planes of C0 and C90
- H = Mounting Height
- D = Cone diameter
- Ev Edge = Illuminance at the edge of the cone of the C0/90 plane
- Ev Center = Illuminance at the center of the cone



# Vertical isolux



## Horizontal isolux



Illumination uniformity figures at the perpendicular plane to the lamp axis.

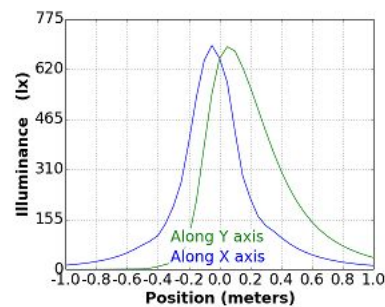
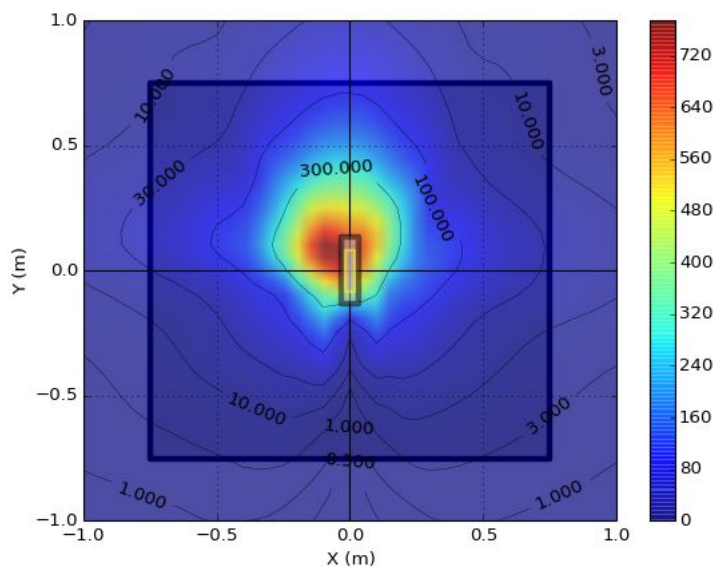
Mounting height of 0.60 m.

C rotation of 0.0 deg. Gamma rotation of 0.0 deg.

Maintenance factor = 1.00.

Nr of lamps: X = 1 pcs, Y = 1 pcs.

Distance between lamps: X = 1.00 meters, Y = 1.00 meters.



**Average Ev:** 94 lx  
**Uniformity:** 0.36 %  
**Max Ev:** 775 lx  
**Min Ev:** 0.34 lx

**Power Consumption:** 0.01 kW

