SUBJECT
Verification of a device with the requirements of:

- International Standards and recommended practices, Annex 14 to the convention on International Civil Aviation Organisation (ICAO), AERODROMES, Volume 1: Aerodrome Design and Operations

- EASA, Annex to ED Decision 2014/013/R - Certification Specifications (CS) and Guidance Material (GM) for Aerodromes Design - CS-ADR-DSN

Approved by :
Johann BLIN
Quality manager

Author: Jean-Marie Cassin, Mercura SAS
Date: 28.05.2021

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1 General specifications

Applicant	**STANDBY- MERCURA** 4 Rue Louis Pasteur ZA Les Gailletrous 41260 LA CHAUSSEE SAINT VICTOR FRANCE
Trade name or mark	MERCURA, Standby
Type	M80 Beacon range ICAO Type C
Category	low-intensity obstacle light – type D
Manufacturer's name and address	MERCURA 4 Rue Louis Pasteur ZA Les Gailletrous 41260 LA CHAUSSEE SAINT VICTOR FRANCE
File	DP21-040_M80

figure 1: M80 Beacon ICAO type C

CONCLUSION: *The object submitted to tests meet the specification of the requirements mentioned in the subject.*

2 Test conditions

Location:	Light Laboratory, MERCURA SAS, La Haye-Fouassière
Measurement done:	Mercura SAS
Date:	28.05.2021
Measurement distance:	1 m
Power supply:	13,5V DC

Test Equipment:

Description	**Type**
Power supply	Elektro-Automatik – Reference : EA-PS 2042-20B
Photometer	Ocean-Optics – reference USB4000 (Sensor + PC Software)
Oscilloscope	Tektronix - reference DPO 2002B
Orientable table	Model OTMT 38371250 (2 axels -45/+45°V 360°H)

Software for data acquisition and analysis:

Description	Version
Ocean-Optics SpectraSuite	Version 5.1

3 Test results

3.1 Test summary

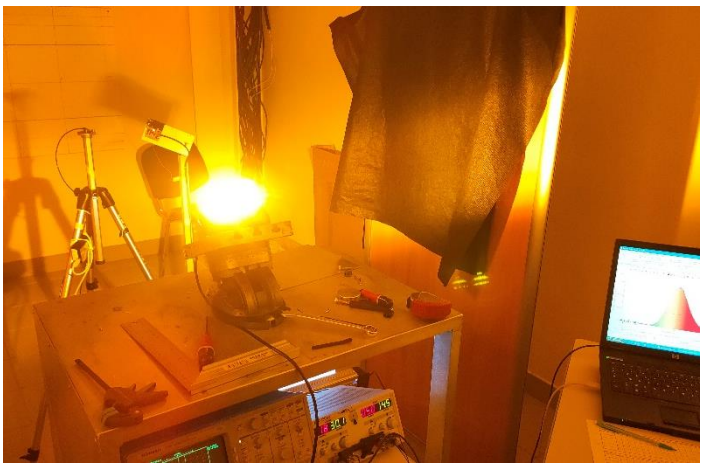
Method for testing:

- Gyroled® M80 beacon is fixed on graduated tiltable.
- Inclination set on +17° for the measurement, then +23° and +11° for measures at +/-6° vertical (Vertical Projection angle 12°)
- For each angle the beacon is rotate up to 360° with measurement each 10°.
- Control of each value on 360° for a result between 40 Candela to 400 Candela light range at 17°, at 11° and at 23°.

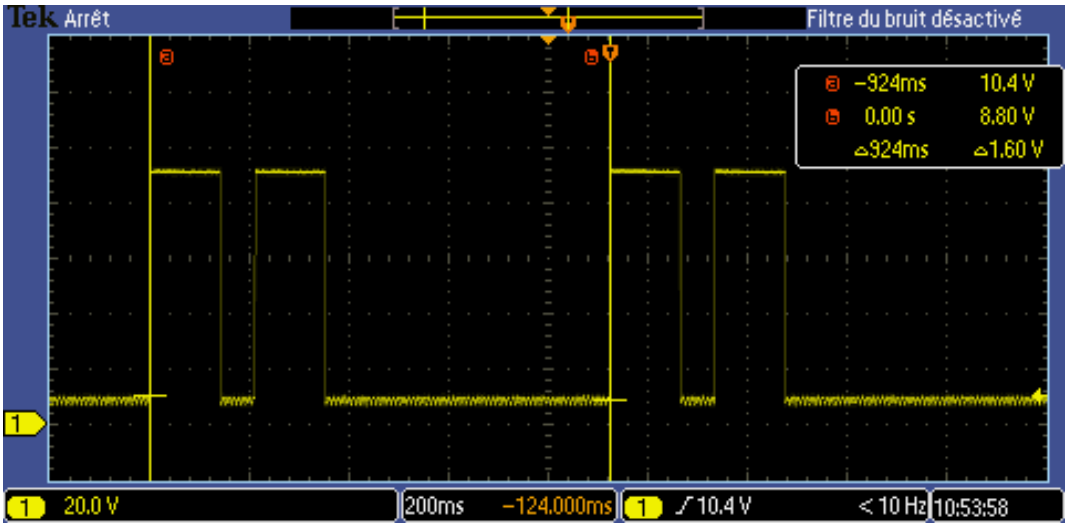
- Light intensity: all measurement meets the specification of ICAO type C requirements please see the report here below ➔ OK

3.1.1 Light effective intensity in candela

	Vertical		
Horizontal à	23° (17°+6°)	17°	11° (17°-6°)
0°	53	79	202
10°	54	83	200
20°	59	90	280
30°	54	76	215
40°	53	78	202
50°	52	80	225
60°	51	92	239
70°	56	119	278
80°	52	97	191
90°	51	105	200
100°	54	113	203
110°	57	162	320
120°	56	129	216
130°	58	124	190
140°	57	128	185
150°	60	130	200
160°	54	168	320
170°	56	110	211
180°	51	116	205
190°	54	82	213
200°	50	88	293
210°	52	65	202
220°	51	64	185
230°	50	66	185
240°	52	70	226
250°	48	94	288
260°	50	76	185
270°	52	74	195
280°	55	73	180
290°	52	98	295
300°	54	86	226
310°	52	83	215
320°	54	80	206
330°	59	82	235
340°	52	140	310
350°	56	122	195

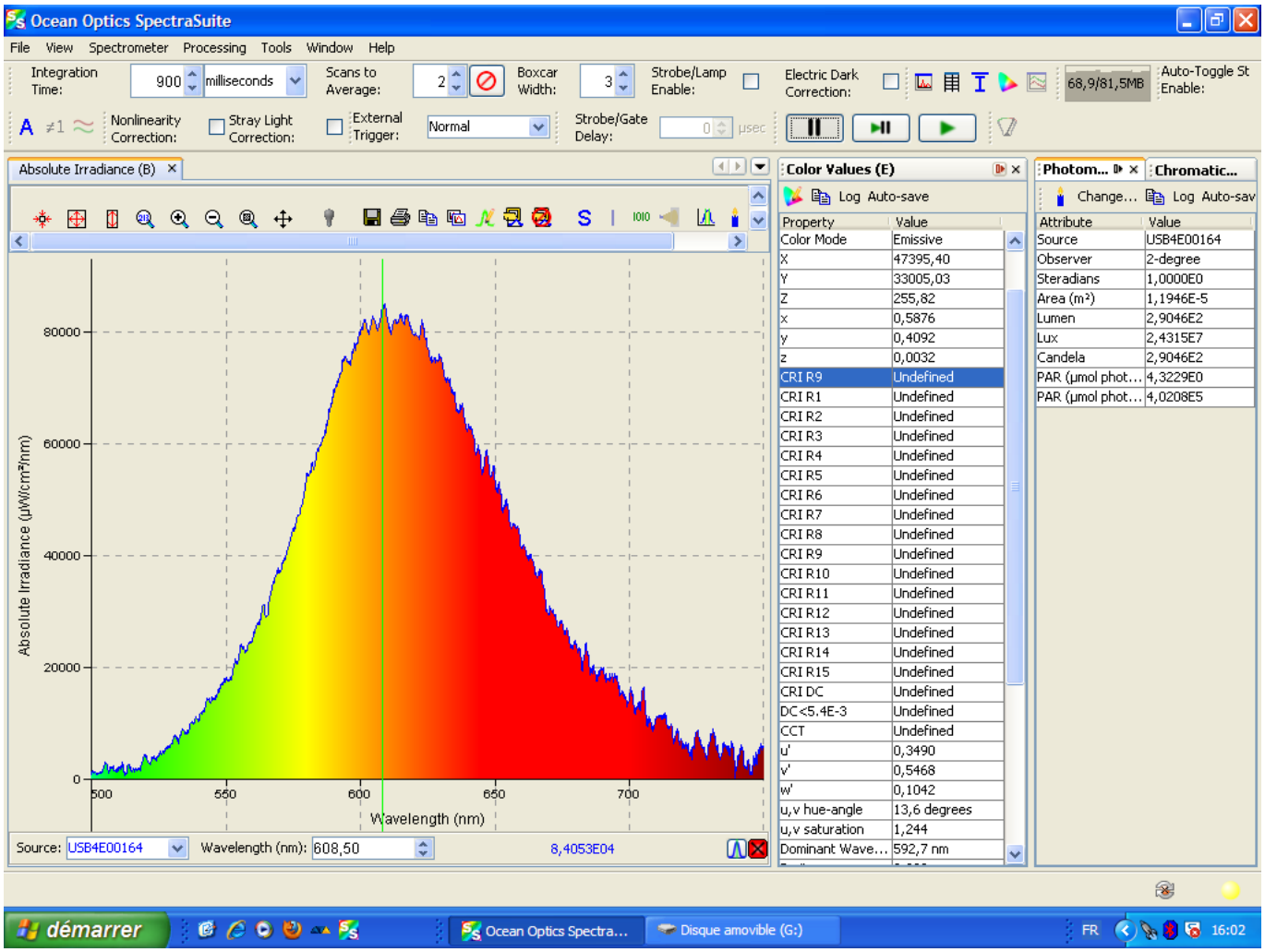


- Colorimetry: x=0.5880 / y=0.420 ➔ OK



- Timing: Period =924 ms => ~65 Flash/minute ➔ OK

3.2 Light Distribution



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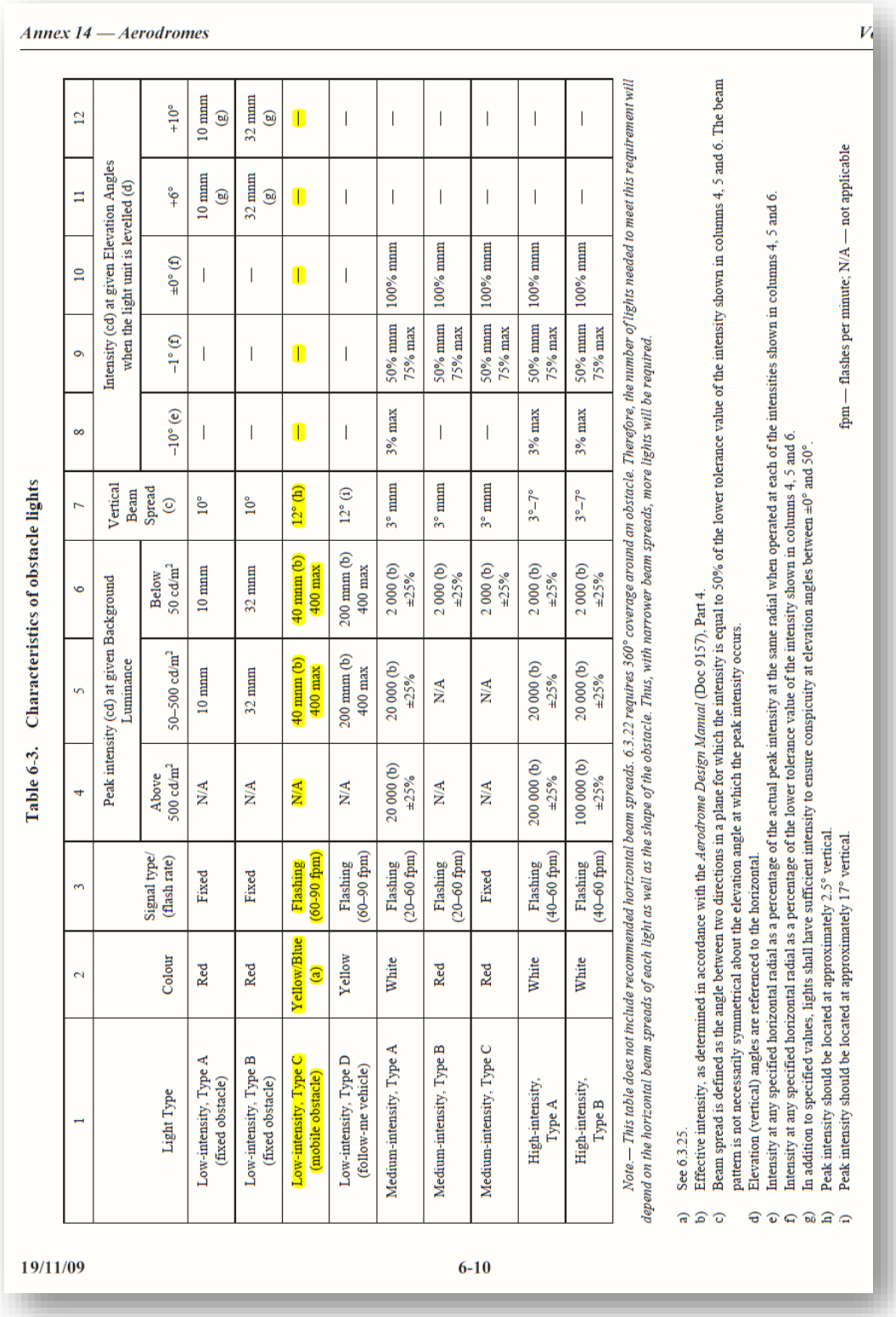
4 Annex: Reminder of the ICAO & EASA Standard



Annex 14 — Aerodromes V

Table 6-3. Characteristics of obstacle lights

1	2	3	4	5	6	7	8	9	10	11	12
Light Type	Colour	Signal type/ (flash rate)	Peak intensity (cd) at given Background Luminance			Vertical Beam Spread (c)	Intensity (cd) at given Elevation Angles when the light unit is levelled (d)				
			Above 500 cd/m²	50–500 cd/m²	Below 50 cd/m²		−10° (e)	−1° (f)	±0° (f)	+6°	+10°
Low-intensity, Type A (fixed obstacle)	Red	Fixed	N/A	10 mnm	10 mnm	10°	—	—	—	10 mnm (g)	10 mnm (g)
Low-intensity, Type B (fixed obstacle)	Red	Fixed	N/A	32 mnm	32 mnm	10°	—	—	—	32 mnm (g)	32 mnm (g)
Low-intensity, Type C (mobile obstacle)	Yellow/Blue (a)	Flashing (60-90 fpm)	N/A	40 mnm (b) 400 max	40 mnm (b) 400 max	12° (h)	—	—	—	—	—
Low-intensity, Type D (follow-me vehicle)	Yellow	Flashing (60–90 fpm)	N/A	200 mnm (b) 400 max	200 mnm (b) 400 max	12° (i)	—	—	—	—	—
Medium-intensity, Type A	White	Flashing (20–60 fpm)	20 000 (b) ±25%	20 000 (b) ±25%	2 000 (b) ±25%	3° mnm	3% max	50% mnm 75% max	100% mnm	—	—
Medium-intensity, Type B	Red	Flashing (20–60 fpm)	N/A	N/A	2 000 (b) ±25%	3° mnm	—	50% mnm 75% max	100% mnm	—	—
Medium-intensity, Type C	Red	Fixed	N/A	N/A	2 000 (b) ±25%	3° mnm	—	50% mnm 75% max	100% mnm	—	—
High-intensity, Type A	White	Flashing (40–60 fpm)	200 000 (b) ±25%	20 000 (b) ±25%	2 000 (b) ±25%	3°–7°	3% max	50% mnm 75% max	100% mnm	—	—
High-intensity, Type B	White	Flashing (40–60 fpm)	100 000 (b) ±25%	20 000 (b) ±25%	2 000 (b) ±25%	3°–7°	3% max	50% mnm 75% max	100% mnm	—	—

Note — This table does not include recommended horizontal beam spreads. 6.3.22 requires 360° coverage around an obstacle. Therefore, the number of lights needed to meet this requirement will depend on the horizontal beam spreads of each light as well as the shape of the obstacle. Thus, with narrower beam spreads, more lights will be required.

a) See 6.3.25.
b) Effective intensity, as determined in accordance with the *Aerodrome Design Manual* (Doc 9157), Part 4.
c) Beam spread is defined as the angle between two directions in a plane for which the intensity is equal to 50% of the lower tolerance value of the intensity shown in columns 4, 5 and 6. The beam pattern is not necessarily symmetrical about the elevation angle at which the peak intensity occurs.
d) Elevation (vertical) angles are referenced to the horizontal.
e) Intensity at any specified horizontal radial as a percentage of the actual peak intensity at the same radial when operated at each of the intensities shown in columns 4, 5 and 6.
f) Intensity at any specified horizontal radial as a percentage of the lower tolerance value of the intensity shown in columns 4, 5 and 6.
g) In addition to specified values, lights shall have sufficient intensity to ensure conspicuity at elevation angles between ±0° and 50°.
h) Peak intensity should be located at approximately 2.5° vertical.
i) Peak intensity should be located at approximately 17° vertical.

fpm — flashes per minute; N/A — not applicable

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1	2	3	4	5	6	7	8	9	10	11	12
Light type	Colour	Signal type/flash rate	Peak intensity (cd) at given background luminance			Vertical beam spread [a]	Intensity (cd) at given elevation angles when the light unit is levelled [d]				
			Above 500 cd/m²	50–500 cd/m²	Below 50 cd/m²		-10° [e]	-1° [f]	±0° [f]	+6°	+10°
Low-intensity Type A (fixed obstacle)	Red	Fixed	N/A	10 mnm	10 mnm	10°	—	—	—	10 mnm [g]	10 mnm [g]
Low-intensity Type B (fixed obstacle)	Red	Fixed	N/A	32 mnm	32 mnm	10°	—	—	—	32 mnm [g]	32 mnm [g]
Low-intensity Type C (mobile obstacle)	Yellow/blue [a]	Flashing (60–90 fpm)	N/A	40 mnm [b] 400 max	40 mnm [b] 400 max	12° [h]	—	—	—	—	—
Low-intensity Type D (follow-me vehicle)	Yellow	Flashing (60–90 fpm)	N/A	200 mnm [b] 400 max	200 mnm [b] 400 max	12° [i]	—	—	—	—	—
Medium-intensity Type A	White	Flashing (20–60 fpm)	20 000 [b] ±25 %	20 000 [b] ±25 %	2 000 [b] ±25 %	3° mnm	3°% max	50 % mnm 75 % max	100 % mnm	—	—
Medium-intensity Type B	Red	Flashing (20–60 fpm)	N/A	N/A	2 000 [b] ±25%	3° mnm	—	50 % mnm 75 % max	100 % mnm	—	—

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