

Test Report: VEGA ICAO Type D

Test Report No. 1018001

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 :

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1 General specifications

Applicant	MERCURA - ZI des Gailletrous - Rue Louis Pasteur - 41260 La Chaussée Saint Victor - FRANCE
Trade name or mark	Mercura
Type	Lightbar VEGA range ICAO Type D
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

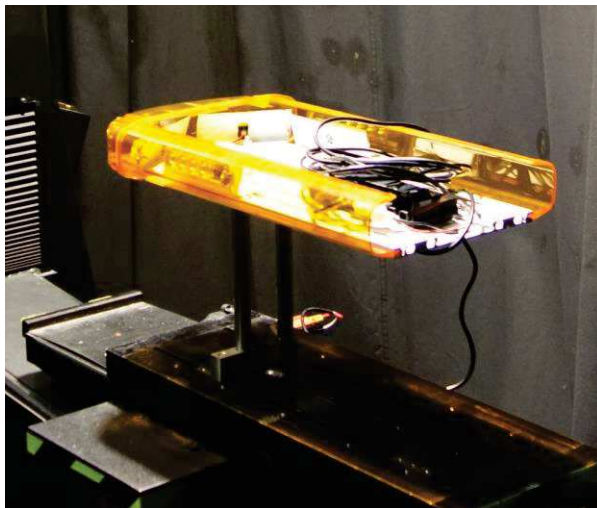


figure 1: Lightbar VEGA ICAO type D

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

2 Test conditions

Location: Light Laboratory, Pintsch Bamag, Dinslaken
Laboratory is certified by Deutsche Akkreditierungsstelle D-PL-11042-01-00

Measurement done: Standby GmbH

Date: 19.09.2018
Measurement distance: 10 m
Power supply: 13,5V DC

Test Equipment:

Description	Type	Serial - No.
Goniometer	LMT: GO-H1300	08A1301
Photometer	LMT: S 1000	08A1301
Photometer head	LMT: SP30S0T-GO	08A1302
Spectrometer	Instrument Systems: CAS 140 B - 151	48614102
Light coupling optics	Instrument Systems: EOP - 410	48614103
Power supply	LMT: GS610	91EB16902
Inclinometer	WYLER AG: Clinotronic Plus	L7757

Software for data acquisition and analysis:

Description	Version
LMT: LIMES 2000	18.1116 Revision 1038
LMT: SoLiT Flash	1.0.100.0
Instrument Systems: SpecWin Pro	3.1.1.1822

3 Test results

3.1 Test summary

	Measured value	Required value	Result
Minimum effective luminous intensity		200 cd	OK
Maximum effective luminous intensity		400 cd	OK
Minimum beam spread (according to edition 5 - 2009)		12°	OK
Peak intensity should be located at approximately 17° vertical		17°	OK
Signal type/ (flash rate)		Flashing (60-90 fpm)	OK
Colour		Yellow	OK

Remark:

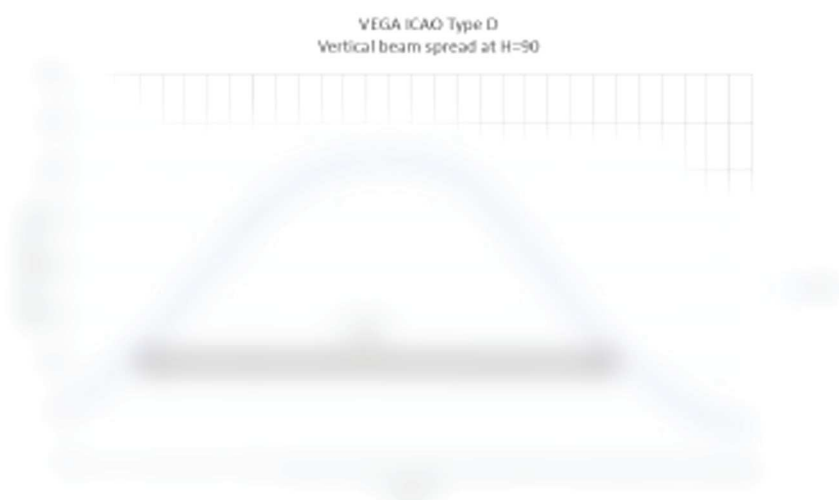
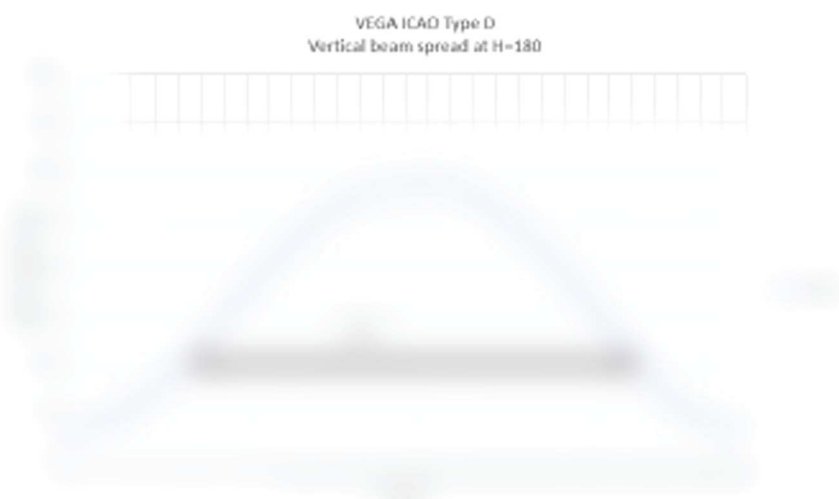
The minimum beam spread is no longer defined in the ICAO Annex 14, Volume 1 - Edition 9 from 2018. But the sample fulfil additionally the requirement of vertical beam from the previous version edition 5.

3.2 Light Distribution

VEGA ICAO Type D
Horizontal Distribution at V=17°
(effective intensity according to Blondel-Rey)



Figure 1: Horizontal Light Distribution at V=17°

*Figure 2: Vertical Light Distribution at H=0°**Figure 3: Vertical Light Distribution at H=90°**Figure 4: Vertical Light Distribution at H=180°*

3.3 Chromaticity

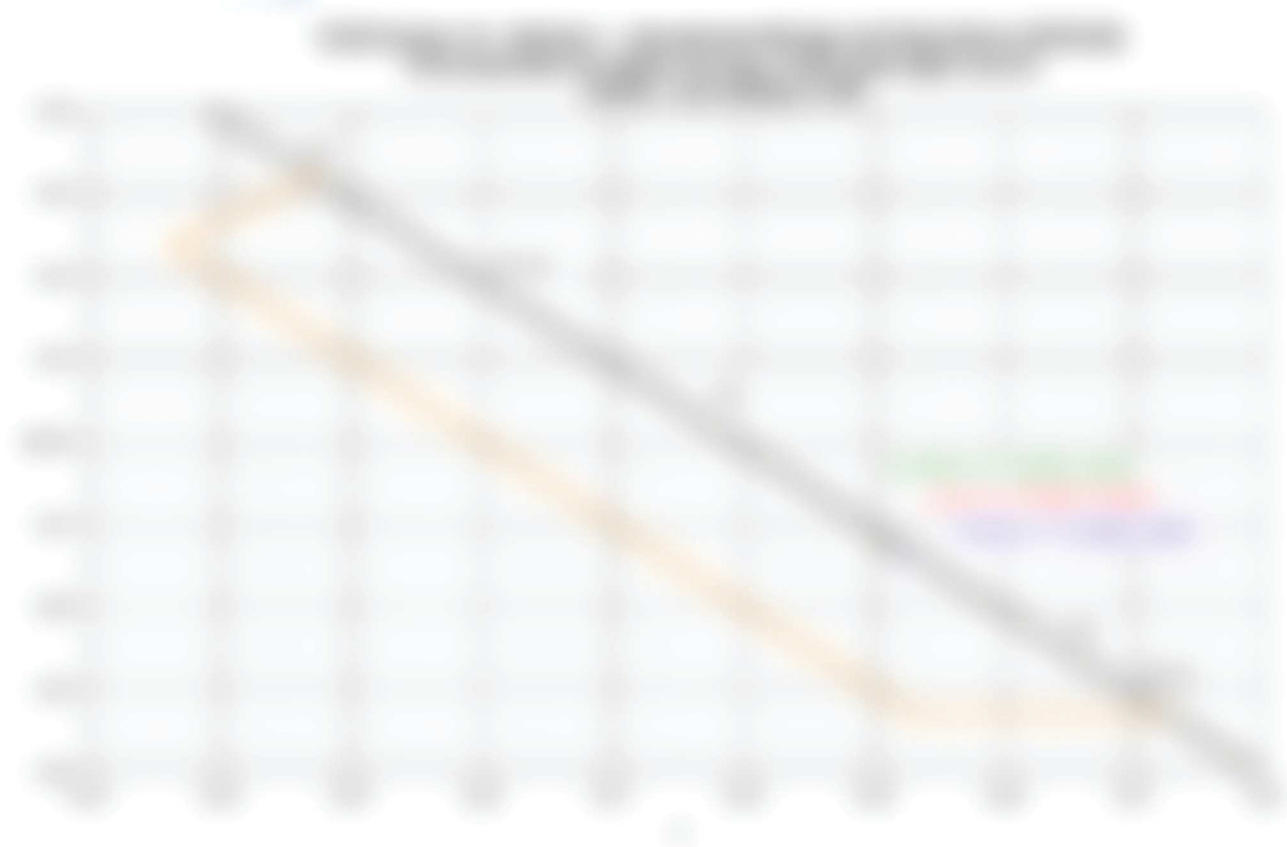


Figure 5: Chromaticity

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Annex 14 — Aerodromes

Table 6-3. Characteristics of obstacle lights

1	2	3	4		5	6	7	8			11	12
			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)			
Light Type	Colour		Above 500 cd/m ²	50–500 cd/m ²	Below 50 cd/m ²		–10° (e)	–1° (f)	±0° (f)	+6°	+10°	
Low-intensity, Type A (fixed obstacle)	Red	Fixed	N/A	10 mmm	10 mmm	10°	—	—	—	10 mmm (g)	10 mmm (g)	
Low-intensity, Type B (fixed obstacle)	Red	Fixed	N/A	32 mmm	32 mmm	10°	—	—	—	32 mmm (g)	32 mmm (g)	
Low-intensity, Type C (mobile obstacle)	Yellow/Blue (a)	Flashing (60–90 fpm)	N/A	40 mmm (b) 400 max	40 mmm (b) 400 max	12° (b)	—	—	—	—	—	
Low-intensity, Type D (follow-me vehicle)	Yellow	Flashing (60–90 fpm)	N/A	200 mmm (b) 400 max	200 mmm (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° mmm	3% max	50% mmm 75% max	100% mmm	—	—	
Medium-intensity, Type B	Red	Flashing (20–60 fpm)	N/A	N/A	2 000 (b) ±25%	3° mmm	—	50% mmm 75% max	100% mmm	—	—	
Medium-intensity, Type C	Red	Fixed	N/A	N/A	2 000 (b) ±25%	3° mmm	—	50% mmm 75% max	100% mmm	—	—	
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% mmm 75% max	100% mmm	—	—	
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% mmm 75% max	100% mmm	—	—	

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

CS-ADR-DSN – BOOK 1
CHAPTER Q – VISUAL AIDS FOR DENOTING OBSTACLES

1	2	3	4		5	6	7	8				11	12
			Above 500 cd/m ²	50- 500 cd/m ²				Below 50 cd/m ²	Vertical beam spread ^a	Intensity (cd) at given elevation angles when the light unit is levelled ^d			
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							
Low-intensity Type A (fixed obstacle)	Red	Fixed	N/A	10 mnm	10 mnm	10°	-10° ^e	-1° ^e	±0° ^f	+6°	+10°		
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	-	-		