REPORT

Issued by an Accredited Testing Laboratory

Contact person RISE
Mikael Lindgren
Division Safety and Transport
+46 10 516 57 13
mikael.lindgren@ri.se

Date	Reference	Page
2021-05-27	105105-146004-3rev1	1 (4)

FEDERAL SIGNAL VAMA S.A.
Dr. Ferrán, 7
08339 VILASSAR DE DALT, BARCELONA
SPAIN

Testing of obstacle light type D amber according to ICAO requirements

(2 appendices)

2022-12-13 Revision 1: Title of document changed to refer to type D instead of type C.

Test object

PXA1 XXDAAL low-intensity obstacle light, type D Amber for mobile obstacle (follow-me vehicles).

RISE Research Institutes of Sweden is accredited for testing of lights against requirements for obstacle lights in ICAO Annex 14 to the Convention on International Civil Aviation, Aerodromes, Volume I Aerodrome Design and Operations (July 2018 including amendments 15 and 16).

Summary of results

The tested LED light source fulfils the requirements for obstacle light, low-intensity type D (follow-me vehicles), in accordance with ICAO Aerodrome Design and Operations (July 2018).

Identification

Your reference: Oscar Carbó, 2021-04-13
Type: PXA1 XXDAAL, XX = alphabetic characters indicating the light bar length
Manufacturer: FEDERAL SIGNAL VAMA, S.A.
Date of items received: 2021-04-12
Status: Upon reception the items were without visible damage
See photos in Appendix 4.

Manufacturer specification of the light source

The light is a bar of varying length, emitting amber light in all horizontal directions by means of a LED unit in both ends. The tested object had no centre section, the variation in centre section is deemed not to influence the results of measurement.

The light bar end contains 12 LED units behind an amber cover.

Nominal voltage: 12/24 V *dc*

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Measurement method

The measurement method follows SP method No. 5109. The light source is connected to +12.0 V *dc* and +24.0 V *dc* during measurement.

Measurement date

Measurements were performed on May 17, 2021.

Uncertainty of measurement

Luminous intensity: ±5 % of reading
Chromaticity coordinates: ±0.005
Angles: ±0,1°

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %. The standard uncertainty of measurement has been determined in accordance with EAL Publication EA-04/2.

Results

Results are presented corresponding to the requirements for low-intensity obstacle lights type D in ICAO: Section 6.2.1, 6.2.2, Table 6-1 Table 6.2, Appendix 1 Section 2.3.

Flashing

The flashing frequency was measured to 80.4 flashes per minute, see Figure 1.

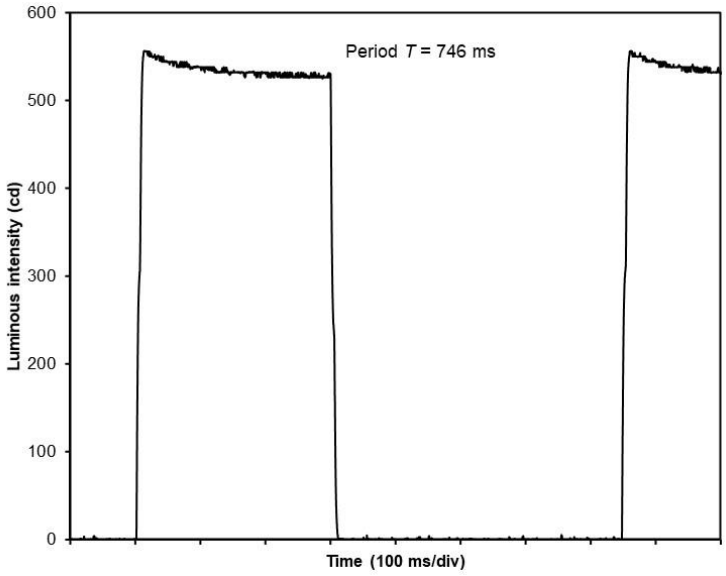


Figure 1. Pulse pattern of the tested object.

The light source fulfils the requirement for flashing in ICAO, Section 6.2, Table 6-1 *Characteristics of obstacle lights*.

Colour

Table 1. Measurement results for colour of the light source.

	x coordinate	y coordinate	Note
PXA1 XXDAAL	0,5801	0,4180	Fulfils requirement

The light source fulfils the requirement for chromaticity coordinates in ICAO, Appendix 1 Section 2.3 *Chromaticities for lights having a solid state light source*. See also diagram in Appendix 1.

Horizontal beam spread

The horizontal beam spread of the light source is 360°, which fulfil the requirements of ICAO Table 6-2 a). Figure 2 shows results for the light source distribution at +17° vertical.

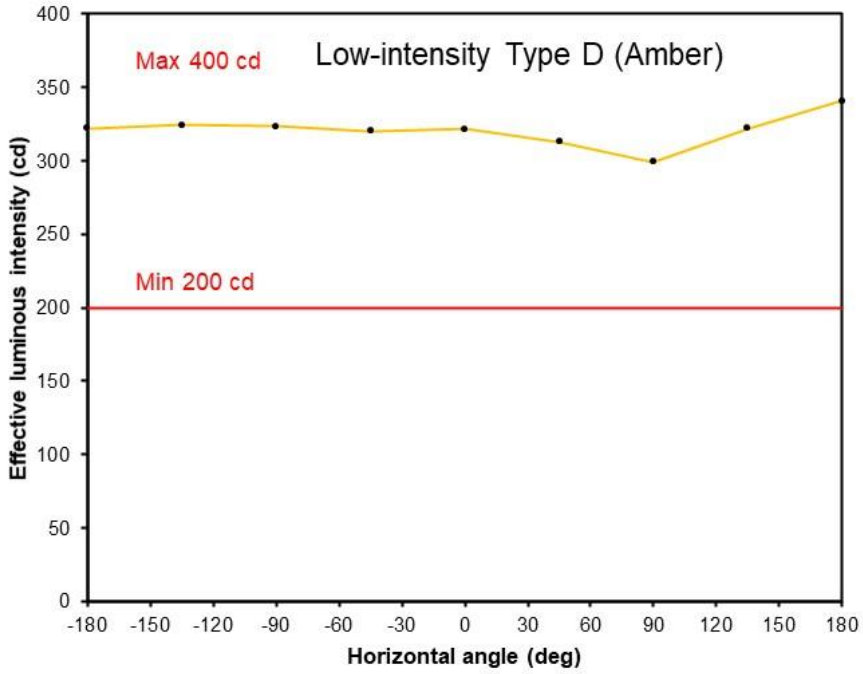


Figure 2. Horizontal beam spread at +17° vertical. The red line shows the minimum requirement.

The light fulfils the requirement of ICAO Table 6-2 for horizontal beam spread.

Vertical beam spread and distribution

The peak intensity was located at approximately +17° vertical, which fulfil the requirements of ICAO Table 6-2. The vertical distribution is shown in Figure 3.

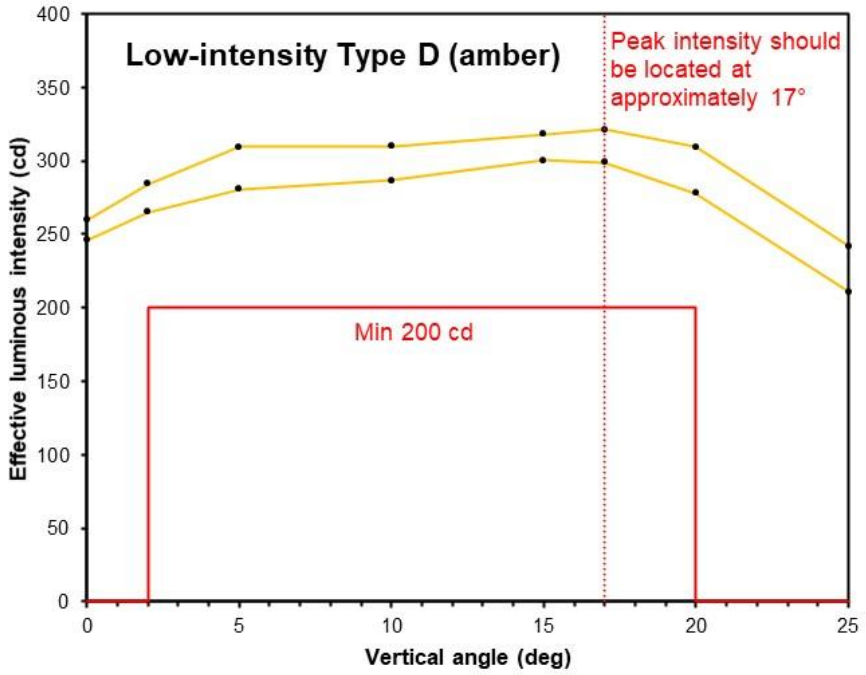


Figure 3. Vertical distribution in two orthogonal directions. The red line indicates the minimum requirement.

The light source fulfils the requirements of ICAO Table 6-2 regarding vertical distribution and minimum luminous intensity.

Remark

The measured values reported are valid only for the unit under test.

RISE Research Institutes of Sweden AB
Measurement Science and Technology - Time and Optics

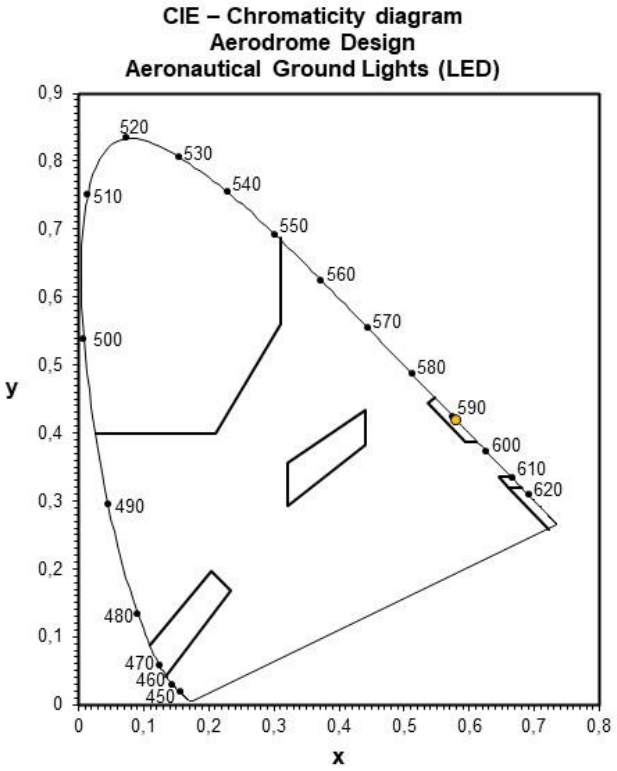
Performed/Reviewed by

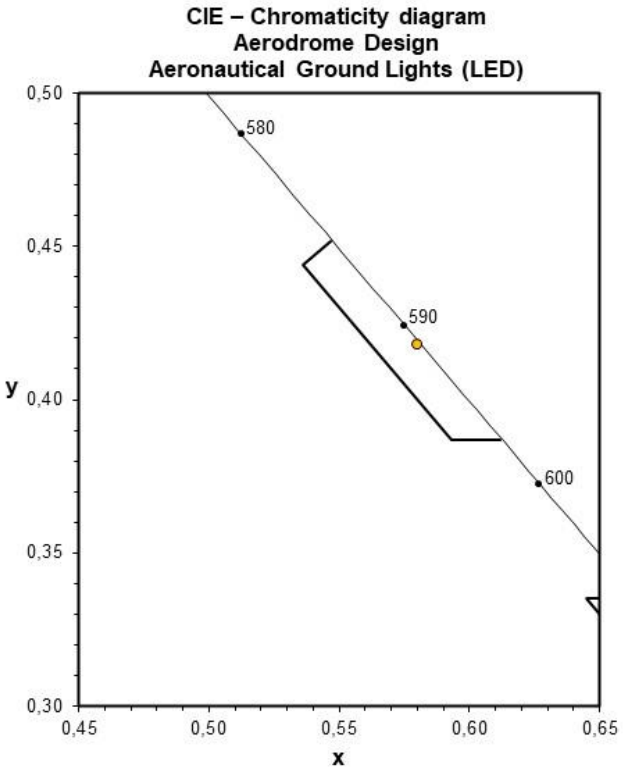
Mikael Lindgren

Appendices

Appendix 1

Colour plot





Appendix 2

Photo of the tested object

Verification

Transaction 09222115557483332943

Document

105105-146004-3rev1 Testing of obstacle light type D amber according to ICAO requirements
Main document
6 pages
Initiated on 2022-12-13 16:13:38 CET (+0100) by Mikael Lindgren (ML)
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Signing parties

Mikael Lindgren (ML)
RISE Research Institutes of Sweden AB
Company reg. no. 556464-6874
mikael.lindgren@ri.se

Signed 2022-12-13 16:15:15 CET (+0100)