

# SAE / DOT Photometric Test Report

Test Name CARBON 2 SPOT - E MARK

Test Date:	02/05/2025		Tested By:	JW
LAMP TESTED:	CARBON 2 SPOT – E	MARK <b>Te</b>	st Result:	PASS
Special Aiming Requirement:		To comply with the regulation limits, and when installed on a vehicle, the lamp should be aimed so that the point of peak intensity is aimed at the horizon with the lamp in E Mark Mode.		

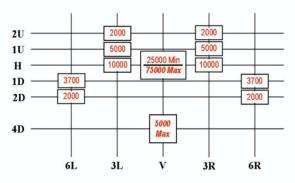
## Aims/Goals of Test:

- To verify that the tested lamps comply with the optical requirements of SAE J581 and DOT FMVSS108 (Upper Beam Headlamp).
- Secondary To confirm if there is any special aiming which is required in order to meet the photometric requirements of J581.

SAE J581 Stabilized FEB2011 Page 5 of 5

## 6.1.6 Photometry

The lamp under test shall meet the photometric requirements contained in Figure 2.



- 1. Values shown are minimum cd requirements except at H-V and 4D-V locations where the maximum
- values are shown in **Italics/Bold**.

  2. A tolerance of ± 1/4 degree in location may be allowed at any test point.

FIGURE 2 - PHOTOMETRIC REQUIREMENTS Minimum Luminous Intensity (cd)

## **RESULTS**

Detailed results are shown on page 2 and beyond. Only page 1 is uploaded to our website, in order to protect our Intellectual Property interests.



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## **REPORT No. PC25060182**

THIS REPORT CONTAINS THE TEST RESULTS OF THE BELOW UPPER BEAM LAMP FOR VEHICLES LESS THAN 2032MM IN OVERALL WIDTH TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REQUIREMENTS OF SEVERAL TESTS OF FMVSS108 AND SAE J575 AUG2018

Test component : Carbon 2

Manufacturer : Lazer Lamps Ltd

Calder House, Central Road

Harlow, Essex CM20 2ST

Test Laboratory : IDIADA,

L'Albornar - Santa Oliva (Tarragona) Spain

Report date : 16/06/2025

Applus **IDIADA** Group is officially accredited by **AMECA** (Automotive Manufacturers Equipment Compliance Agency, Inc)

## **SUMMARY**

<u>TEST</u> (FMVSS-108, SAE J575 AUG2018)

Upper beam lamp

Moisture test	PASSED
Corrosion test	PASSED
Dust test	PASSED
Warpage test	PASSED
Vibration test	
Color test	PASSED

Performed by

Laura Zapata Sala TEST ENGINEER Revised by:

Ramon Santafè Guiu DEPARTMENT MANAGER

<sup>\*</sup> THE PRESENTED RESULTS REFER ONLY TO THE TESTED SAMPLE

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## **VIBRATION TEST**

Test performed by: Joan Fonts Date: May-June, 2025

## **MOISTURE TEST**

At completion of test, the accumulation of moisture inside the device is less than 2cc and there is no visible moisture in the sealed reflex unit.

The sample tested FULFILS with the moisture test requirements



Samples after moisture test

## **CORROSION TEST**

At completion of test, there is no evidence of corrosion which would affect the proper function of the device.

The sample tested FULFILS with the corrosion test requirements



Sample after corrosion test

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## **DUST TEST**

After the Dust test, photometric intensity	requirements are fulfilled	CORRECT
Tittel the Bust test, photometric intensity.	requirements are runnied.	COMME

Tost Doints (dogwoos)		UB2 - Photometric intensity (cd)			
Test Points (degrees)		Min.	Max.	Before dust test	After dust test
2U	V	1500	-	50820	51330
1U	3L	5000	-	49270	49280
1U	3R	5000	-	50020	48360
Н	V	40000	75000	41730	40420
Н	3L	15000	-	38310	38030
Н	3R	15000	-	38320	36680
Н	6L	5000	-	27050	26890
Н	6R	5000	-	27100	25910
Н	9L	3000	-	17640	17630
Н	9R	3000	-	17090	16390
Н	12L	1500	-	11460	11340
Н	12R	1500	-	11300	10940
1.5D	V	5000	-	15530	14880
1.5D	9L	2000	-	8697	8160
1.5D	9R	2000	-	10100	9834
2.5D	V	2500	-	5453	5234
2.5D	12L	1000	-	2759	2544
2.5D	12R	1000	-	4730	4729
4D	V	-	12000	1361	1324
Maximum		_	-	56078	55298



Sample after dust test

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# IDIADA

## **VIBRATION TEST**

The device completed the vibration test without evidence of material physical weakness, lens or reflector rotation, displacement or rupture of parts except bulb failures.

The sample tested FULFILS with the vibration test requirements



Sample after vibration test

## WARPAGE TEST

If warpage is observed, it does not affect the compliance of other tests.	CORRECT



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## COLOR TEST

Test method: Tristimulus method

Bulb operated at rated mean spherical candlepower / Device measured at design voltage

Test distance: 3.16 m. (10.4 ft)

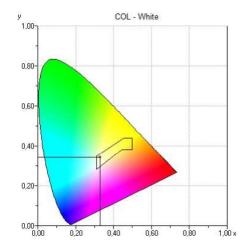
## WHITE ZONE:

The color of light emitted must fall within the following boundaries:

limit towards the blue: x = 0.31
 limit towards the yellow: x = 0.50
 limit towards the green: y = 0.15 + 0.64x
 limit towards the purple: y = 0.05 + 0.75x
 limit towards the red: y = 0.38

Trichromatic co-ordinates	Sample
X	0.329
y	0.343
z	0.328

The sample device has uniform spectral characteristics in all useful directions.



The sample tested FULFILS with the color test requirements.

Test place: L'Albornar, E-43710 Santa Oliva (Tarragona)

Test date: May-June, 2025

<sup>\*</sup> THE PRESENTED RESULTS REFER ONLY TO THE TESTED SAMPLE



# TECHNICAL DOCUMENTATION





HIGH PERFORMANCE LIGHTING

Calder House, Central Road Harlow, Essex, CM20 2ST T: +44 (0)1992 377674

DATE: 29/04/2025

DOCUMENT VERSION 1

TRADE NAME: Lazer Lamps Ltd

TYPE: CARBON-2

## **REVISION TABLE**

Revision #	Description	Date	Approved
1	Initial Release	29/04/2025	BRS

## **Representatives Address:**

Lazer Lamps EU Bv Industriestraat 18/C bus Unit 7, 8755 Ruiselede Belgium

## **Manufacture Address:**

Lazer Lamps Ltd Calder House, Central Road Harlow, Essex CM20 2ST

## Overview

The "CARBON-2" is an auxiliary HIGH BEAM LAMP and is compliant with DOT FMVSS108 requirements. This document is intended to provide a detailed explanation for the device.

## **Device Technical Description**

The Driving Light function is designed for both LH and RH traffic. The lamp is designed for fitment on the centreline of a vehicle. The headlamp does not contain an adjustable reflector. Alignment of the headlamp is controlled by an adjustable mount to the vehicle. The light source is LED.

## **Lens Material**

A choice of different materials will be used depending on availability and market conditions. The lens will be either:

- Exolon GP + UVHC3000K (sheet equivalent to Makrolon 3107)
- Exolon GP + Momentive PHC587C2 (sheet equivalent to Makrolon 3107)



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## **Operating Voltage**

The device is compatible with both 12V and 24V electrical systems.

## **Thermal Management**

There is a microchip on the LED module which analyses the temperature reading of a thermistor on the board. If the temperature on the board hits the trigger temperature, the microcontroller uses Pulse Width Modulation to reduce the drive current of the Reg 149 LEDs. The reduction in drive current isn't visible to the driver of the vehicle, as we reduce 3% for every 1C above the trigger temperature until equalisation has occurred. This safety mechanism may engage when the lamp has been switched on for around 30 minutes, and the ambient temperature around the lamp is 25C without air flow.

## **Other Functions**

The lamp also contains other functions when the customer is using the lamp in a State (or country) where DOT FMVSS108 photometric limits aren't required, or where they are driving off-highway. These include a yellow dipped beam light for off-road driving in foggy or dusty conditions, and a white and amber decorative back-light function.

## **Conformity of Production:**

The manufacturing site is approved to ISO 9001, 2015, with specific conformity procedures having been established to monitor the Lazer product quality and ensure that conformity requirements are achieved.

A dedicated dark room with 10m light measurement area and light measurement equipment has been established to monitor Driving beam performance. Lazer uses the candela readings to confirm that production lamps remain within Conformity of Production requirements.

The manufacturing site was successfully audited by the Spanish Ministry in May 2020.

SIGNED: Ben Russell-Smith

B.M. Fith

Director – Lazer Lamps Ltd

