

Report Number 144516BP
Project Number 14XC_PALAZON_FAROLA

Passive Safety test of support structures for road equipment complying with EN 12767:2007

Customer reference:
SISTEMAS PALAZÓN S.L.
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Execution:



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Approval:



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This report contains 51 pages including this cover page and appendixes.

1. REFERENCE OF THE STANDARD (EN 12767:2007)

The test was performed complying with the European Standard EN 12767:2007.

2. TEST LABORATORY

Name: IDIADA Automotive Technology, S.A.

CIF (Company Tax Number): A-43581610

Address: L'Albornar – PO Box 20, E-43710 Santa Oliva (Tarragona), SPAIN

Telephone number: +34 977 166 021

Facsimile number: +34 977 166 036

Internet address: www.applusidiada.com

Test site location: Outside area of Passive Safety Laboratory

Accreditation body: Entidad Nacional de Acreditación (ENAC)

Address: C/ Serrano 240, 3^a, 28016 Madrid

Accreditation number: 35/LE159

Date of approval: 10th October 2014

3. REPORT NUMBER

144516BP

4. CLIENT

Name: SISTEMAS PALAZÓN S.L.

Address: Plaza Vicente López Gómez, 4, bajo

Telephone number: +34 678 638 979

Facsimile number: -

e-mail: sistemaspalazon@hotmail.es

5. TEST ITEM

Date of reception: 11th August 2014

Date of test: 7th November 2014

Name of test item: Sistema SP

Drawings, descriptions and instructions: Annex I

6. TEST PROCEDURE

6.1. Test type

Theoretical impact speed: 100 km/h

Theoretical impact angle: 20°

Vehicle mass: 900 kg

Expected behaviour:

The system SP is designed to meet the conditions as follows:

- Speed class [km/h]: 100
- Category of energy absorption: No energy absorption (NE)

The SP was designed by Sistemas Palazón S.L. to be installed in the base plate of the lamppost. The aim of this system is to ensure the sliding of the base plate of the lamppost in case of vehicle impact at a speed higher than 35 km/h. The SP system is fixed to the foundation slab by a second plate fixed to the anchoring bolts.

Two guides are located on the side parts of the plate, at the centre a notch made of polyamide is cut; in the case of vehicle collision at high speed it lets the lamppost be released from the concrete base.

6.2. Test area

Description of type and condition of test area

The test facilities are located on the Applus+ IDIADA facilities within an estate of 380 hectares in L'Albornar, municipality of Santa Oliva in the province of Tarragona.

These facilities are attached to the crash laboratory of the passive safety department. They consist of two main areas: a paved area from where the vehicle approaches and another area where the barriers and systems to be tested will be installed.

The test area consists of two zones: the vehicle acceleration area and the area for the installation of the barrier. There is a 300 m-long runway to accelerate the vehicle to the desired speed. The acceleration of the vehicle is controlled by a PLC and is gradual up to the area where the car is released. The vehicle, guided by the drive system, impacts against the support structure at 20° to the tested system and is released about 6 metres before the impact point.

The free movement area of the vehicle is smooth, paved, flat and free of puddles, snow or obstacles that prevent a stable approach of the vehicle to the safety barrier.

Condition of underground:

The gravel used where the test item foundation is installed shows the composition as follows:

Sieve (mm)	Mass (%)
<63	100
<31.5	85 / 100
<16	55 / 90
<8	30 / 60
<4	15 / 45
<2	10 / 30
<0.063	2 / 7

Test track picture: Annex II.

Pictures: Annex III.

6.3. Test vehicle

Model: Citroën Saxo

Year: 1999

Vehicle Identification Number, VIN: VF7S0HDZF56257139

Test inert mass (ballast included) [kg]: 824 kg

Ballast, location and weight:

Ballast	Position	Weight [kg]
Iron spherical parts	Engine	25
Iron rectangular parts	Trunk	35
Data acquisition system	Trunk	20

Dummy, location, type and weight, safety belt type:

- Hybrid III 50% in driver position: 75 kg
- 3 points safety belt

Test mass (test inert mass plus dummy mass) [kg]: 899 kg

Vehicle dimensions: Annex IV

Centre of Gravity location:

- X (from front axle): 905 mm
- Y: -7 mm
- Z (from the floor): 495 mm

Pictures: Annex V

6.4. Vehicle of the calibration test

Model: Citroën Saxo 1.5 D

Year: 1999

Test number and date of the calibration: 100499PI / 25/01/2010

Speed-time graph of the calibration: Annex VI

7. RESULTS

7.1. General

Test number: 144516BP

Date: 7th November 2014

Weather conditions during the test:

- Temperature: 22,1°C
- Humidity: 38%
- Atmospheric pressure: 997 mbar

Impact angle [°]: 20,6°

Impact speed [km/h]: 99,7 km/h

Exit speed [km/h]: 84,2 km/h

General description of the test sequence:

The vehicle impacted the Sistema SP at 99,7 km/h at an angle of 20,6°. As a consequence, the streetlight flew out, the vehicle slightly modified its trajectory to the right and its speed decreased to 84,2 km/h.

The impact caused damage in the frontal part of the vehicle. However, it did not affect either the frontal wheel axle or the passenger compartment.

Pictures: Annex VII

7.2. General behaviour requirements

Did the structure perform as expected? Yes

Did some risks become as defined in paragraph 5.2.2.1? No

Did the vehicle behave as defined in paragraph 5.2.2.2? Yes

Acceleration Severity Index, ASI: 0,7

Theoretical Head Impact Velocity, THIV [km/h]: 15,8 km/h

According to the maximum values of ASI and THIV registered, the Sistema SP would have reached the level 2 of passengers' safety in the impact test with 100 km/h speed class.

Did some intrusion occur in the passenger compartment? No

7.3. Additional requirements for particular elements. Supplementary comments

Lowest point according to paragraph 5.3 [m]: N.A.

Additional observations:

After the impact, the lamppost is launched in the same direction as the vehicle. However, it reaches lower speed and higher height than the vehicle. Thus, the test vehicle moves under the lamppost without contacting it.

The measurement of the deformation of the vehicle roof did not apply in this test due to the use of the braking system of the vehicle by the testing laboratory. The activation of this braking system does not affect the final results obtained within the limits set by the EN 12767 standard.

7.4. Additional restrictions regarding installation

To install the SP system some details should be considered in the preparation of the soil foundation. The bolts must not stand 3 cm above the ground level; moreover, the surface where the anchor plate is installed must be 2 cm below this same level, and so the use of self-levelling mortar is recommended.

7.5. Acceleration diagrams

Annex VIII