





Cidaut

CIDAUT (Research and Development Centre in Transport) is a research centre of the University of Valladolid, as well as active in the areas of competitiveness and industrial development. Nowadays Cidaut works in a wide range of areas, as well as other innovative areas concerning transport, energy and environment.

In 2002, responding to the increasing demand for products and services from manufacturers, Road Administrations and individuals, could improve the safety of vehicles and passive safety in accordance with either national and international standards.



Accredited laboratory

The Infrastructure Safety Laboratory of Cidaut is accredited by the Spanish Accreditation Body ENAC for the performance of tests according to European Standards UNE-EN 1317 "Road Restraint Systems" and UNE-EN 12767 "Passive Safety of Support Structures and Equipment", as well as the Spanish Standard UNE 135900 "Motorcyclist Protection Systems".

Cidaut conducts impact tests, granting its independence and impartiality, in order to assess any system regarding to test according to those standards that need to be met to prove compliance with the essential requirements of those standards. The laboratory is also recognised by the European Certification Body as Notified Laboratory for the performance of impact tests accordingly to those standards.

EN 1317

In order to improve and maintain highway safety, the design of safer roads requires the installation of road restraint systems. These systems are designed to redirect errant vehicles with a specific level and they can provide guidance for pedestrians or other road users. Testing execution according to the EN 1317 standard requires soil conditioning –controlled soil, asphalt, concrete, bridge and other structures. Vehicles employed for testing execution vary from 900kg cars to 38 ton trucks and they are conditioned so that weight, mass distribution and dimensions agree with standard's specifications.

EN 12767

EN 12767 standard specifies performance requirements and defines levels in passive safety of support structures intended to reduce the severity of injury to the occupants of vehicles impacting with the support structures -lighting columns, utility poles, cantilever supports, gantry supports, etc. Therefore it classifies them by the results obtained in impact tests with 900kg vehicles and with speed class criteria (50, 70 and 100), energy absorption categories (HE, LE, NE) and occupant safety.

UNE 135900

Cidaut carries out impact tests on motorcyclist protection systems which are intended to reduce the severity of a motorcyclist's impact against the road restraint system. For the test, an anthropomorphic dummy is conducted to the system in a lying down position at specific speed. The UNE 135900 standard establishes the procedures and biomechanical criteria for the evaluation of motorcyclist protection systems.



& Energy), was created in 1993, with the objective of coordinating and channeling the research by contributing to the needs of companies in the automotive sector, thus enhancing both their safety and product development.

For the testing of road infrastructure, Cidaut inaugurates the most innovative tests facilities, where they can investigate, develop or even assess products for their implementation on the road network in terms of international standards and protocols.



Facilities

Cidaut's Laboratory has the most technologically advanced installations and a wide experience in the field of transport safety necessary for appropriate testing of road restraint systems. It is placed on a 23 hectares site where tracks over 700m long make it possible to accelerate vehicles over 110 km/h.

For testing performance of safety barriers, whatever it is the containment level to be assessed, a controlled soil emplacement with the required particle size and compactness is strictly verified before installation, thus ensuring repeatability of the results. Testing facilities also include a bridge parapets testing area with the necessary anchorages for quick installation and evaluation into real driving conditions.



In addition to that, several zones along acceleration track are prepared for installation and testing of crush cushions in all possible configurations described by EN 1317, support structures according to EN 12767 on rigid or controlled soil, non intrusion devices, security barriers and anti-terrorists protection systems according to ASTM F 2656-07 and British PAS 68 protocols.

Testing of motorcyclist's protection systems is developed in a full independent facility containing acceleration track and the necessary emplacement for installation of continuous and discontinuous protection systems on both controlled or concrete soils.

to reduce the
execution an
speed and angle.
evaluation of

Installation of road
and performance
on according to
eplicas,... The
y shall be also
ations.

ests according
ures for Road

ptance criteria
nized by every

e safety terms
permanent road
ports,..., and
in accordance
and levels of

Cidaut

Standards development

As an active member of the Working Group within the Technical Committee CEN-T 226, the Infrastructure Safety Laboratory of Cidaut contributes to the continuous updating of the European Standard EN-1317, providing its know-how acquired throughout years of investigation in the field of passive safety.

Cidaut is also fully aware of the necessary increase in motorcyclists' safety and as a consequence it is member of the Subcommittee on safety barriers of the Technical Committee of AENOR CTN-135 and Technical Expert of the Working Group of AENOR responsible for the development and edition of UNE 135900 Standard.



Technical Experience

For testing according standards' requirements, an on-board speed control system is employed so that configuration speed can be maintained independently of vehicle's weight. Vehicles also incorporate a guiding system for precise impact angle achievement.

The instrumentation necessary for data measurement is placed inside vehicles. After impact, recorded data are retrieved from the on-board acquisition system and processed by appropriate software for obtaining required classification parameters.

Test impacts are full-length recorded thanks to high-speed high-resolution cameras located where standards require and at those emplacements where manufacturers consider as fundamental for evaluation of component's behaviour. It is also possible to configure recording rates for detailed observation over 2000 fps.

For the evaluation of motorcyclist protection systems a non-cable in-dummy instrumentation and acquisition system are employed with the aim of better simulate those conditions appearing during real accidents.

Our technical experience also facilitates behaviour's analysis of two vehicles impacting to each other. That is the case of impact tests according to ISO 13232 standard where the test procedures for the impact of a motorbike colliding with an approaching or static car are described.





Testing of substructures

Testing of a system may be understood as the final step of its development. Design phase may however be assisted by testing of product's subsets so that manufacturers can introduce modifications in design before testing the system as a whole.

Developers can also check whether foundations, anchorages and fixings perform according to design specifications during test impacts and get detailed information about forces' transmission through each element of the system.

For that purpose Cidaut offers the chance of performing impact tests by the use of a high energy pendulum facility which is composed of a steel structure of up to 13 meters in height and both rigid and controlled soil types for product's installation. Impactor's mass and speed can be set to required value for precise adjustment of impact energy.

Research into safety

Cidaut continuously collaborates into National and European research projects with the aim of improving testing procedures and, if necessary, introducing new parameters for increasing the grade of similarity between impact tests and real condition accidents.

Test laboratory works in conjunction with those departments of Cidaut specialized in active-passive safety, mechanical behaviour, accidentology and human factor, for a better understanding of accidents' circumstances and to reach the requests of a more demanding markets and society.

According to this philosophy our facilities are not only focused to the assessment of safety elements of the road network, but also of any system, regardless of its nature, focused to decrease both the risk of suffering an accident or the damage once an accident occurs.





Laboratorio de Seguridad en Infraestructura Vial

Poligono Industrial Dehesa de la Villa, parcela 14b

47250 Mojados, VALLADOLID. SPAIN

Tfno: (+34) 983 54 80 35 Fax: (+34) 983 60 79 63

www.cidaut.es