Tests



RESEARCH CENTER
ITENE

Testing catalogue

We test your packaging, transport and logistics solutions



Facts and figures

+200 professionals
18% of whom have a PhD

12,000 m² of facilities

+30 years of experience

We provide all the tests required in the areas of packaging, transport and logistics

Over 500 types of tests
based on recognised standards (EN, ISO, ASTM, etc.)

119 accredited tests

Specific tests for different types of materials and applications

Materials

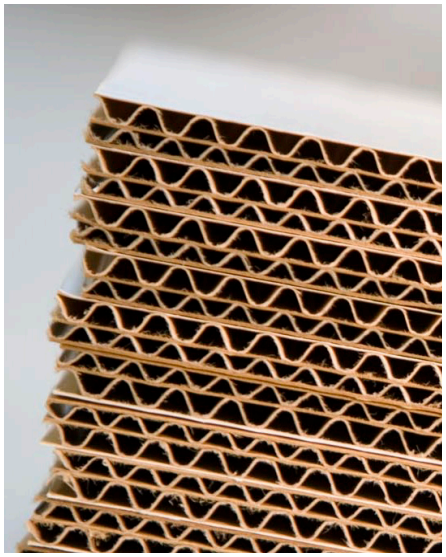
- Paper and board
- Corrugated board
- Plastics (flexible, multilayer complexes, etc.)
- Coatings, inks, adhesives
- Wood
- Metal
- Glass
- Textiles

Other products

- Nanoparticles
- Chemicals subtances
- Personal protective equipments

Packaging

- Pallets and box pallets (wood, plastic, cardboard)
- Plastic and corrugated board packaging
- Plastic packaging (bottles, bags, trays)
- Industrial packaging
- Palletised goods and complete, filled transport packages
- E-commerce packaging



Certifications, accreditations and approvals

Test accreditations

97 packaging tests accredited by **ENAC** and **ILAC-MRA** with accreditation No. 316 / LE678, based on the international quality standard **UNE-EN ISO/IEC 17025:2017**, which establishes the necessary requirements to be met by testing laboratories and guarantees the quality of the results.

Test certifications

Laboratory certified to perform **22** ISTA (International Safe Transit Association) protocols.

Approvals for testing

Laboratory recognised by **RecyClass** for conducting plastic recyclability tests, and by **Cepi** and **Aticelca** for conducting paper and cardboard recyclability tests.

Laboratory recognised by **TÜV AUSTRIA, DIN CERTCO, BPI, EUROPEAN BIOPLASTICS, COMPOSTABLE MATERIALS** and **AUSTRALASIAN BIOPLASTICS** for conducting compostability and biodegradability tests.

ITENE has been the **first Spanish laboratory designated by Amazon as an APASS member** (Amazon Packaging Support and Supplier Network) and is authorized to perform tests according to the ISTA6 Amazon SIOC and ISTA6 Amazon Overboxing protocols.

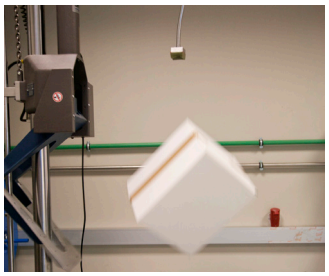
Testing services



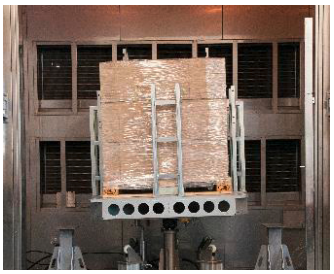
Analysis of packaging materials



Analysis of primary packaging



Assessment and validation of secondary packaging



Transport simulation for traditional and e-commerce distribution



Food safety: food contact materials and packaging



Compostability assessment



Safety in working environments

Analysis of packaging materials



Paper, board and corrugated board

- **Physical properties:** thickness, grammage, whiteness, humidity, etc.
- **Surface properties:** water absorption, contact angle, opacity, roughness, etc.
- **Mechanical properties:** tensile strength, burst strength, CMT, RCT, SCT, CCT, FCT, ECT, bending, etc.
- **Gas permeability** (barrier properties): air permeability, oxygen transmission rate (OTR), water vapour transmission rate (WVTR), carbon dioxide transmission rate (CO^2TR).



Films and plastics

- **Physical-mechanical properties:** tensile strength, hardness, friction coefficient, tearing, thickness, grammage, puncture, etc.
- **Gas permeability** (barrier properties): oxygen transmission rate (OTR), water vapour transmission rate (WVTR), carbon dioxide transmission rate (CO^2TR).
- **Thermal and rheological properties:** thermogravimetric analysis (TGA), dynamic mechanical analysis (DMA), differential scanning calorimetry (DSC), melt flow index (MFI), rheological analysis, SEM, etc.
- **Structural properties:** infrared spectroscopy (IR and FTIR), optical microscopy, etc.

Analysis of primary packaging

Characterisation of packaging and opening systems using standardised methods and test protocols

- Mechanical tests (press and turn, squeeze and turn, snap caps, thread system...) for the evaluation of primary packaging
- Tests to assess packaging functionality
- Evaluation of ergonomic aspects and identification of areas of improvement
- Working groups to validate new packaging designs





Assessment and validation of secondary packaging

Packaging for fruit and vegetables (cardboard and plastics)

Corrugated cardboard:

- Grammage of component papers
- Water absorption
- Low frequency vibration
- Vertical compression (BCT)
- Bottom bending resistance

Plastics:

- Vertical compression (BCT)
- Bottom bending resistance
- Stacking
- Drop



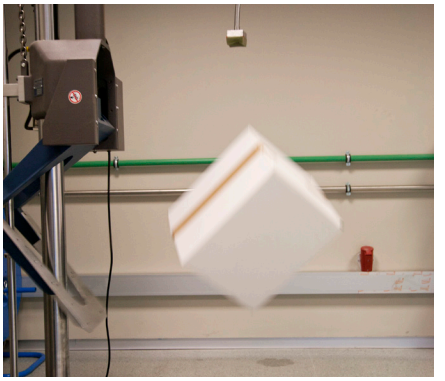
Industrial packaging and box pallets (cardboard, plastic, metal and wood)

Compression resistance, stacking, vertical impact by dropping, local impact, base deflection and static coefficient of friction.

Pallets

Assessment of pallets for goods handling:

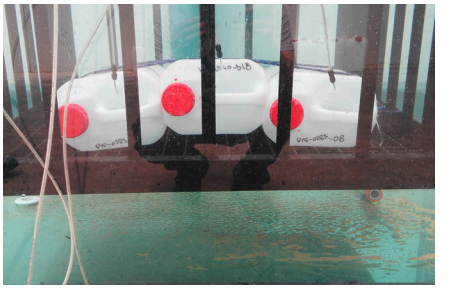
- **Tests with nominal load:** racking, fork lifting, compression, stacking, etc.
- **Maximum load tests in use:** racking, fork lifting, compression, stacking, twin track conveyors, etc.
- **Durability tests:** corner drop test, block impact test, top deck impact test, friction test, etc.



Packaging for dangerous goods transport

Primary and secondary packaging, large bulk containers and large packaging for the transport of dangerous goods and infectious substances by road, rail, sea and air (ADR, RID, IMDG, ICAO and IATA).

- **Drop and topple** tests
- **Watertightness** and **internal pressure** tests
- **Stacking** test
- **Chemical compatibility** (white spirit, surfactant solution, nitric acid, butyl acetate, acetic acid and water) and **permeability** test
- **Puncture** test on packaging used with infectious substances
- **Lift** test from below and above
- **Vibration** test
- **Tearing and righting** test

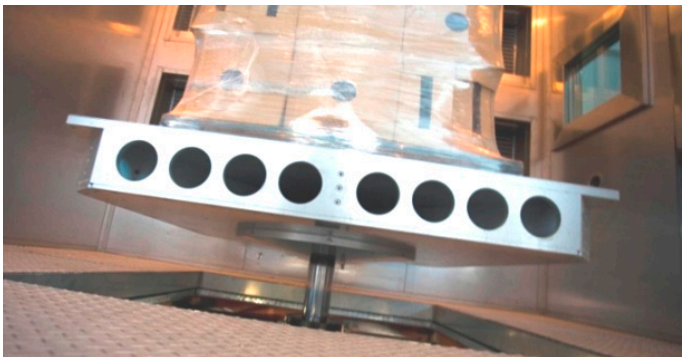


Transport simulation for traditional and e-commerce distribution

Complete, filled transport packages and palletised unit loads

- Static and dynamic **compression resistance** tests
- **Sinusoidal vibration** test using a variable frequency
- **Vertical random vibration**
- **Simulation of transport vibrations** (including **pitch & roll**
- **Toppling** and **rolling** tests
- **Rotational drop and drop test by free fall**
- **Study of packaging behaviour under constant top load (Creep test)**
- **Acceleration tests** on palletised unit loads **(EUMOS 40509)**
- **Monitoring of transport and distribution conditions.**
- Development of **adhoc simulation protocols**
- Simulation protocol in accordance with **ASTM D4169 standard**





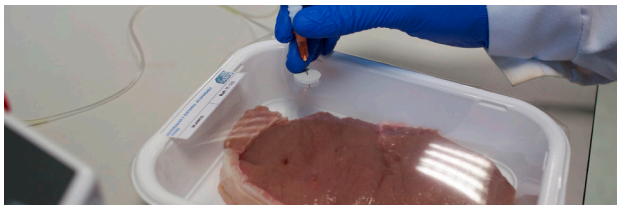
22 ISTA Protocols (International Safe Transit Association)

ISTA certified laboratory

- **Procedure 1A:** Package-Products weighing 150 lb (68 kg) or less
- **Procedure 1B:** Packaged-Products weighing over 150 lb (68 kg)
- **Procedure 1C:** Extended Testing for IndividuaL Packaged-Products weighing 68 kg or less
- **Procedure 1D:** Extended Testing for Individual Packaged-Products weighing over 68 kg
- **Procedure 1E:** Unitized Loads
- **Procedure 1G:** Packaged-Products weighing 150 lb (68 kg) or less (Random Vibration)
- **Procedure 1H:** Packaged-Products weighing over 150 lb (68 kg) (Random Vibration)
- **Procedure 2A:** Packaged-Products weighing 150 lb (68 kg) or less
- **Procedure 2B:** Packaged-Products weighing over 150 lb (68 kg)
- **Procedure 2C:** Furniture Packages
- **Procedure 3A:** Packaged-Products for Parcel Delivery System Shipments 70 kg (150 lb) or less
- **Procedure 3B:** Less-Than-Truckload (LTL) Shipment
- **Procedure 3E:** Unitized Loads of Same Product
- **Procedure 3F:** Packaged-Products for Distribution Center to Retail Outlet Shipment 100 lb (45 g)
- **Procedure 3H:** Performance Test for Products in Mechanically Handled Bulk Transport Containers
- **Project 3K:** Fast Moving Consumer Goods for the European Retail Supply Chain
- **Project 6-AMAZON.COM-SIOC:** Ships in Own Container (SIOC) for Amazon.com Distribution System Shipment (Type A, B, C, D, E, F, G and H)
- **Project 6-AMAZON.COM-Over Boxing:** e-Commerce fulfillment for parcel delivery shipment
- **Project 6-SAMSCLUB:** Packaged-Products for Sam's Club® Distribution System Shipment
- **6-FEDEX-A:** FedEx Procedures for Testing Packaged Products Weighing Up to 150 lbs
- **6-FEDEX-B:** FedEx Procedures for Testing Packaged Products Weighing Over 150 lbs
- **Procedure 7D:** Temperature Test for Transport Packaging

Food safety: food contact materials and packaging materials

- **Overall migration in food simulants** (aqueous, acidic, dry and fatty) by immersion, filling and cell (EU Regulation 10/2011). Ethanol 10%, ethanol 20%, ethanol 50%, ethanol 95%, acetic acid 3%, olive oil, isooctane
- **Specific migration of substances** included in Plastics Regulation 10/2011 (in food simulants and in food)
- **Compliance with CEPI Food Contact Guidelines and BfR XXXVI** recommendation for paper and board
- **Evaluation and quantification of NIAs** (Non-intentionally added substances)
- **Determination of the quantity of substance** in a finished material (QM) and of its residual content (QMA), including substances such as bisphenols
- **Food contact analysis** according to FDA regulations
- **Restrictions on the use of PFAS, heavy metals, SVHCs, and total fluorine in packacing**, in accordance with the European PPWR Regulation
- **Validation of recycled materials in contact with food** in accordance with Regulation (EU) No 2022/1616



Compostability

Recognised laboratory for industrial and domestic compostability testing according to EN 13432 and NFT 51-800

The scope also includes other international standards such as: ASTM D6400, ASTM D6868, AS 4736, ISO 17088, ISO 18606, EN 17427, and AS 5810. In addition, the laboratory is recognised for determining biodegradability in different environments such as water (ISO 14852) and soil (ISO 23517 and EN 17033) .

Biodegradation:

- Determination of the ultimate **aerobic biodegradability** of plastic materials under controlled composting conditions - Method by analysis of evolved carbon dioxide according to **ISO 14855-1**.

Disintegration:

- Determination of **disintegration** of plastic materials degree under defined composting conditions in a **pilot-scale** test according to **ISO 16929**.
- Determination of **disintegration** of plastic materials degree under simulated composting conditions in a **laboratory-scale test** according to **EN ISO 20200**.

Ecotoxicity:

- **Terrestrial plant tests** (OECD Guideline 208).
- **Invertebrate tests** (ASTM E 1676-04-2012 and ISO 11268-1).
- **Bacterial tests** (ISO 15685).

Through our test reports, companies can obtain the main certification marks.

INDUSTRIAL COMPOSTABILITY

HOME COMPOSTABILITY

SOIL & WATER BIODEGRADABILITY

Recyclability

Recognitions for the evaluation of recyclability

Plastics

ITENE is recognised by RecyClass for the demonstration of experimental recyclability of polystyrene, flexible PE and flexible PP, as well as plastic components from electrical and electronic equipment and the automotive sector.

RecyClass

ABS | ABS-PC | PE | PE Flexibles | PP | PP Filled | PP Flexibles | PS | PS Rigids

Paper and cardboard

Our laboratory is recognised to validate the recyclability under CEPI and ATICELCA methods.



Safety in working environments

Toxicology, industrial hygiene and nanosafety

Toxicological and ecotoxicological evaluation tests for nanomaterials and chemical substances: characterisation of cytotoxicity and genotoxicity, assessment of dermal and ocular irritation, and characterisation of acute toxicity in the aquatic environment.

