CEBIMAT

Your Partner in Eco-Friendly Bioplastic Solutions

We embark on a journey to create a greener future together, harnessing the power of biodegradation for a more sustainable world.

Why CEBIMAT?

Deep Industry Experience

Academy-backed professionals ensure reliable results with their extensive knowledge.

Consulting Expertise

Tailored solutions cover all your sustainability testing needs.

Advanced Facilities

State-of-the-art facilities with trained staff guarantee precise testing for accurate results.

Commitment to Excellence

We're dedicated to delivering timely, informed insights, prioritizing excellence in every aspect of our service.

Our Services

Tests

According to international standard and advanced biodegradation, disintegration, composting and ecotoxicity measurements.

Partnerships

We cultivate strategic R&D partnerships to develop sustainable projects and advance innovation collaboratively.

Assesments

Assessments of sustainability and environmental impact for actionable insights towards eco-friendly practices.

Development

CEBIMAT develops of ad-hoc tests according to your specific needs.

Consultancy

Providing specialized training on biodegradation and legislation, equipping you with knowledge for sustainable practices.

R&D

We're not just service providers; we're active partners in R&D projects, driving sustainable innovation.

A Spin-off Company By

UNIVERSITAT JAUME I

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Industrial Compostability and Organic Recyclability

Introduction

Organic recyclability, through composting, is the natural way to valorize organic residues. These tests enable us to determine whether the materials or products being studied are compostable. The tests are conducted in accordance with applicable international protocols and standards, including EN 13432 for packaging, EN 14955 for plastic products, and ISO 17088 for organic recycling.

The compostability assessment framework consists of four complementary tests, all of which together ensure the organic recyclability of the material or product:

- Control of Constituents: This test ensures that the material does not contain heavy metals or toxic compounds.
- Biodegradation Tests: These evaluate how plastic breaks down and determine its environmental impact.
- Disintegration Tests: These assess how plastics break into smaller fragments under various environmental conditions.
- Ecotoxicity: This test ensures that the product resulting from biodegradation is not toxic to living organisms, and it is evaluated at three levels: higher plants, invertebrates, and microorganisms.

Technical Details

Tests

- Control of Constituents
- Biodegradation
- Disintegration
- Ecotoxicity (Plants, Invertebrates and microorganisms)

Required Sample

- 50g per sample in powder form
- At least 750 g per sample in the final form (preferible film, sheet, yarns or textile)

Test Duration

- Test durations range from 45 days to 6 months depending on the sample.
- Typical duration for a biodegradable plastic is **3 months.**

Standards

- EN 13432
- EN 14955
- ISO 17088
- ISO 14855
- ISO 20200
- OECD 208
- ISO 11268-1 & ISO 11268-2
- ISO 15685

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Home Compostability

Introduction

Home composting is a method for managing organic waste at home or on a smaller scale, where organic matter is transformed into compost through the action of microorganisms. The studies we conduct at CEBIMAT aim to determine whether a material can be organically recycled through home composting. Currently, there is no international standard for this type of evaluation, but the Australian standard AS 5810 is generally regarded as the reference standard.

This standard consists of five evaluations, which are as follows:

- Control of Constituents: To ensure that the material does not contain heavy metals or toxic compounds.
- Biodegradation Tests: These evaluate how plastic breaks down and assess its environmental impact.
- Disintegration Tests: To evaluate how plastics break into smaller fragments under different environmental conditions.
- Compost Quality Assessment: Ensures an equivalent quality of the resulting compost when compared with compost without the plastic/material.
- Ecotoxicity: To ensure that the product resulting from biodegradation is not toxic to living organisms, and this is evaluated at two levels: higher plants and invertebrates.

Technical Details

Tests

- Control of Constituents
- Biodegradation
- Disintegration
- Compost Quality
- Ecotoxicity (Plants and Invertebrates)

Required Sample

- At least 750 g per sample or 650g + 300 cm2 is required.
- Sample can be both in powder, in pellet, in sheets or other forms.

Test Duration

- Test durations range from 6 to 12 months depending on the sample.
- Typical duration for a biodegradable plastic is **6 months.**

Standards

- AS 5810
- NF T51-800
- ISO 14855
- ISO 20200
- OECD 208
- ISO 11268-1 & ISO 11268-2
- AS 4454

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Soil Biodegradability Studies

Introduction

Studies on the biodegradability of a material or product in soil provide insights into the effects of using the product in terrestrial environments, as well as the consequences of potential uncontrolled releases into these environments. These studies are especially crucial for plastics used in agriculture, horticulture, and forestry.The tests included in this study are based on ISO 23517, titled "Soil Biodegradable Materials for Mulch Films for Use in Agriculture and Horticulture." These tests determine the biodegradability of the material under simulated soil conditions.

The compostability assessment framework consists of four complementary tests that collectively ensure the organic recyclability of the material or product:

- Control of Constituents: This test ensures that the material does not contain heavy metals or toxic compounds.
- Biodegradation Tests: These assess how plastic breaks down, determining its environmental impact.
- Disintegration Tests: These evaluate how plastics break into smaller fragments under varying environmental conditions.
- Ecotoxicity: This test ensures that the product resulting from biodegradation is not toxic to living organisms and is evaluated at three levels: higher plants, invertebrates, and mycoorganisms.

Technical Details

Tests

- Control of Constituents
- Biodegradation
- Disintegration
- Ecotoxicity (Plants, Invertebrates and microorganisms)

Required Sample

- At least 250 g per sample or 100 g + 300 cm2 is required.
- Sample can be both in powder, in pellet, in sheets or other forms.

Test Duration

- Test durations range from 3 to 12 months depending on the sample.
- Typical duration for a biodegradable plastic is **6 months.**

Standards

- ISO 23517
- ISO 17556
- OECD 208
- ISO 11268-1 & ISO 11268-2
- ISO 15685

Ultimate Aerobic Biodegradation In Composting Conditions

Introduction

This method assesses the biodegradation of a material in composting simulated composting conditions. During aerobic biodegradation, carbon dioxide (CO2) and water are generated, with CO2 release quantified throughout the experiment. This measurement allows the determination of cumulative CO2 production, which, in turn, is used to calculate the percentage of organic carbon from the test substance that has converted into gaseous mineral carbon as CO2.

This test can be done both in industrial composting conditions and in home composting conditions.

Technical Details

Tests

- ISO 14855

Required Sample

- 50 g per sample in powder or pellet form is required.

Test Duration

- Test durations range from 45 days to 12 months, depending on the conditions and the sample.
- The typical length for home conditions is **6 months.**
- The typical length for industrial conditions is **3 months.**

Ultimate Aerobic Biodegradation In Soil Conditions

Introduction

This method assesses the ultimate aerobic biodegradation of a material in a controlled soil environment, achieved through microbial activity under ambient room temperature conditions. These tests consist of tracking the conversion of the organic carbon in a sample into CO2 by the microorganisms present in the soil. The degree of biodegradation in this test is always compared to a reference material.

Technical Details

Tests

- ISO 17556

Required Sample

- 50 g per sample in powder or pellet form is required.

Test Duration

- Test durations range from 6 months to 24 months depending on the sample.

Biodegradability in Simulated Marine Conditions

Introduction

This test is designed to evaluate the aerobic biodegradability of materials under simulated marine conditions. During this test, the material is exposed to natural seawater or an inoculum obtained from seawater, and the conversion of organic carbon within the sample into CO2 is monitored. Controlled conditions of temperature, agitation, oxygenation, and water quality are maintained throughout the test to simulate a controlled marine environment.
These studies are relevant for both plastics intended for use in the marine environment, such as fishing gear, and for understanding the potential outcomes if the material were to be released uncontrollably into nature.

Technical Details

Standards

- ISO 19679
- ISO 23832
- ASTM D6691
- ISO 23977
- ISO 22404

Required Sample

- At least 50 g per sample is required.
- Sample can be both in powder, in pellet, in sheets or other forms.

Test Duration

- Test durations range from 45 days to 24 months depending on the sample.

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Disintegration in Simulated Marine Conditions

Introduction

This test, based on ISO 23832, addresses the vital assessment of physical degradation in plastics exposed to marine environments. Plastics can undergo ultimate biodegradation through microbial actions, which results in erosion at the solid-liquid interface, leading to a loss of mass and physical properties. This standard outlines three test methods designed to determine degradation rates and propensity for physical breakdown in natural marine settings. These methods include burying plastics in wet sandy marine sediment, placing them at the sediment-water interface, and exposing them to seawater. Key parameters for assessment include mass loss rate, erosion rate, and loss of mechanical properties. Additionally, disintegration, which involves the physical breakdown of samples into very small fragments, can also be evaluated.

ISO 23832 serves as a valuable tool for designing marine-related products and assessing environmental risks. It focuses on physical degradation under aerobic conditions at a laboratory scale, while excluding thermo-degradation and photo-degradation assessment.

Technical Details

Tests

- Degradation
- Disintegration

Required Sample

- At least 250 g per sample or 100 g + 300 cm2 is required.
- Sample can be both in powder, in pellet, in sheets or other forms.

Test Duration

- **Typical 9 months.**
- In demand tests, between 3 months to 24 months.

Standards

- ISO 23832

Biodegradation in Real Marine Environment

Introduction

In real marine environments, the biodegradation of plastics is a complex process influenced by various factors, including temperature, water conditions, and the presence of microbial communities. Plastics are exposed to a dynamic interplay of physical, chemical, and biological forces as they interact with the marine ecosystem. Microbes, such as bacteria and fungi, play a crucial role in breaking down plastics through enzymatic reactions. The extent of biodegradation depends on the type of plastic, its chemical composition, and the surrounding environmental conditions.

In real marine environments, biodegradation is measured over a specific time period, and the data is recorded. In our case, CEBIMAT has a unique facility in a protected area along the Mediterranean coast, with conditions monitored and periodic inspections conducted. Our divers place the samples in the facility and periodically retrieve them for study and analysis.

Technical Details

Required Sample

- At least 250 g per sample (in powder or pellet form) and/or 36 specimens of the final product.

Test Duration

- **Typical 12 months.**
- Test can ranges from 6 months to 2 years.

Chemical Analysis, Sample Preparation and General Characterization

Introduction

Within our organization, we offer an extensive array of services encompassing chemical analysis, sample preparation, and comprehensive general characterization.

Additional Services

Control of Constituents	Standart
Volatile and Dry Solids	ISO 3451-1
Heavy Metals	ISO 17294-2
Heavy Metals (Hg)	ISO 12846
Organic and Inorganic Fluorine	EN 14582

Supplementary Analysis	Standart
Criogenic Milling	ISO 10210

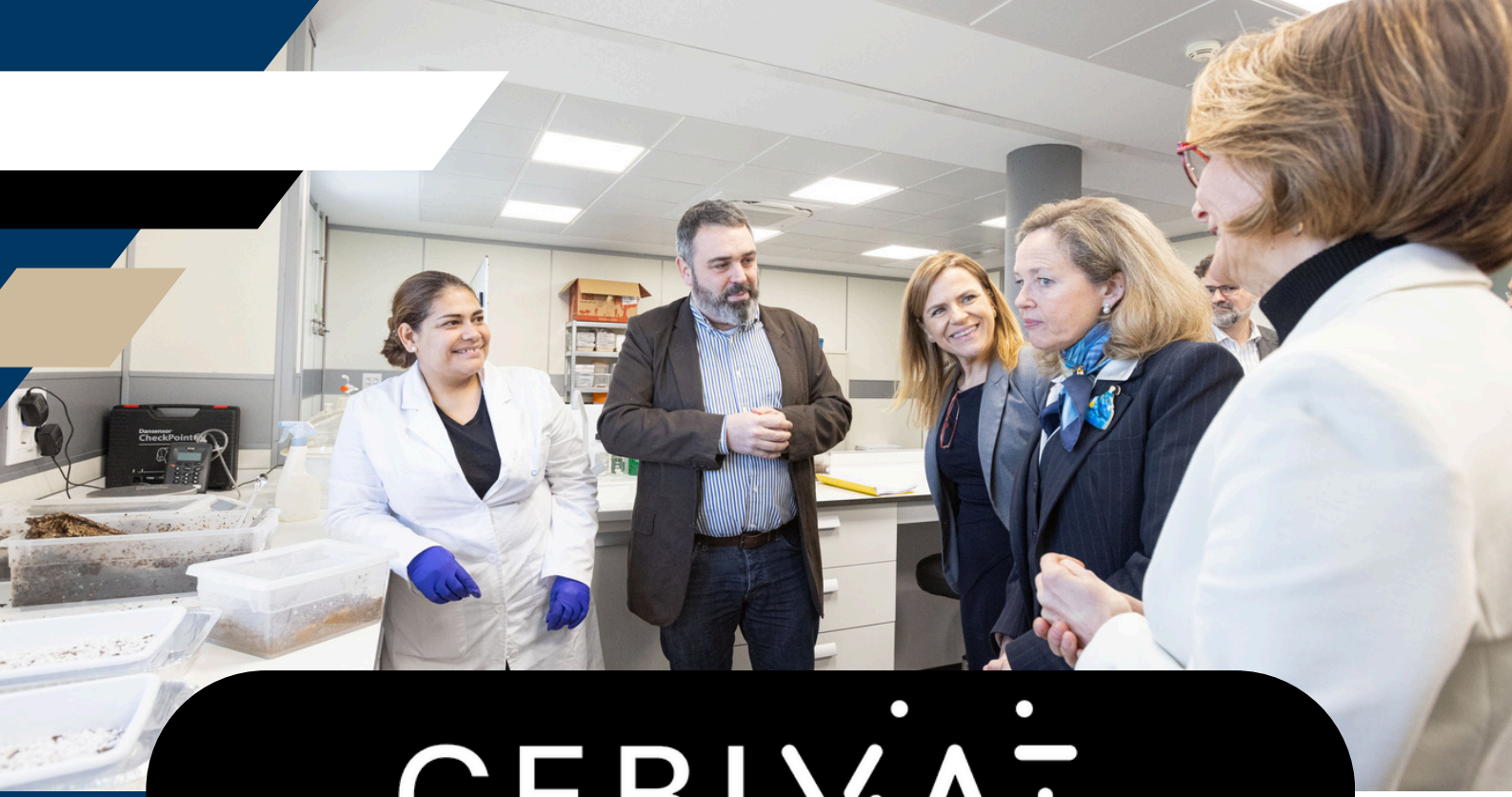
Complementary Services

Introduction

At our company, we recognize the complex nature of sustainable material production, acknowledging the multitude of steps involved in this journey. As a result, we have crafted a range of complementary services aimed at supporting your entire process, ensuring seamless progression from ideation to product.

Complementary Services

Name of the Service	Standart
Determination of Harmful Chemicals	ISO 14389, EN 14372, EN 1122, ISO 16186, EN 71-3
Food Contact Tests	CEN/TC 194, ISO/TC 166, ISO/TC 107, ISO/TC 186, ISO/TC 34/SC 12, ISO/TC 6
Molecular Weight Determination	ISO 16014-1:2019
Migration Analysis	Contact Us.
Dishwasher Safer Analysis	EN 12875, UNE 53928:2020



CEBIMAT

About Us

CEBIMAT is dedicated to conducting research and investigations in the field of biodegradation.

What We Do

Our services encompass biodegradation testing and support in the realm of research and development.

Why Us

We have a substantial expertise in the evaluation of biodegradable materials and are equipped with cutting-edge equipment and a highly skilled workforce.

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