Organic Forum Meeting, The Association for Renewable Energy and Clean Technology (REA)

3rd November 2025

COMPOSTABLE BY DESIGN PLATFORM

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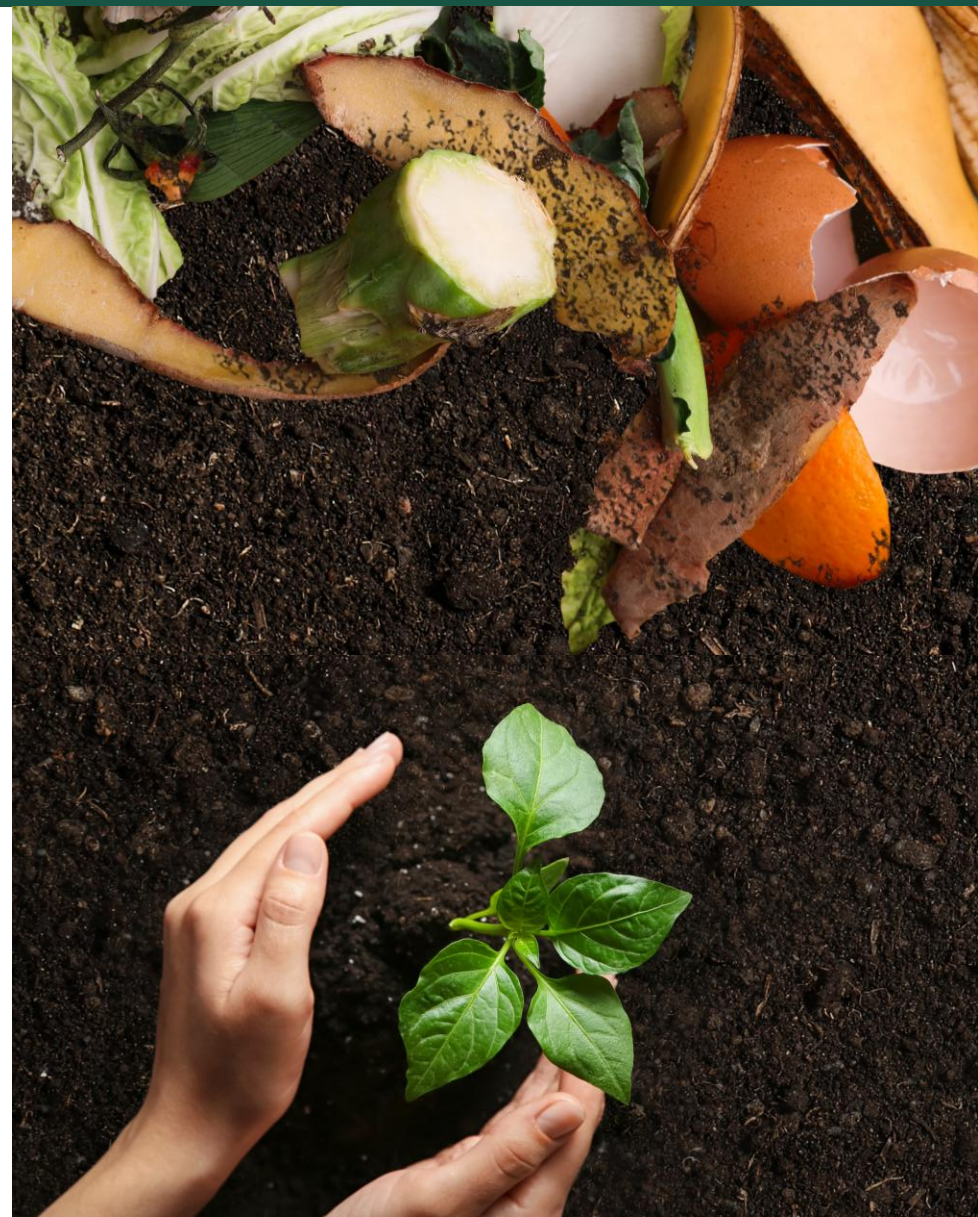
WHO WE ARE

A cross-value chain initiative promoting collaboration and innovation in compostable packaging and products, and associated bio-waste treatment technologies and processes

FOUNDING BELIEF

Using suitable compostable applications contributes to a circular economy by improving bio-waste recycling, boosting collection rates, and minimising contamination



VALUE-CHAIN REPRESENTATION

Retail and Brands

Unilever, DELTA, PEPSICO, KraftHeinz, JDE Peet's, Kimberly-Clark

Bio-waste recycling associations & technology providers

kompost & biogas verband, REA, Jones Celtic BioEnergy, TotalEnergies, interseroh Die Recycling-Allianz, Consorzio Italiano Compostatori, BIOMASSE suisse, cré Composting & Anaerobic Digestion Association of Ireland

Film or paper producers, packaging converters

AHLSTROM, starkraft, BIOPAP, FUTAMURA, Sinclair, Metsä, stordenso, Taghleef Industries, Graphic Packaging INTERNATIONAL

Certification Bodies & Testing Laboratories

TÜVRheinland DIN CERTCO Precisely Right., Normec OWS, OK compost, TÜV AUSTRIA

Resin producers

NOVAMONT, Ingevity, BASF We create chemistry, kaneka, BIOTEC, NatureWorks, FKuR plastics - made by nature, TotalEnergies Corbion, BIOME BIOPLASTICS

Institutes & Universities

BOKU UNIVERSITY, RESEARCH CENTER ITENE, iSP Institute of Sustainable Processes UNIVERSITY OF VALLADOLID, AIMPLAS PLASTICS TECHNOLOGY CENTRE

OUR VISION AND OBJECTIVES

VISION

A future where **appropriate** compostable packaging and products are widely accepted and effectively recycled at scale across bio-waste facilities in Europe supporting sustainable bio-waste management and the circular economy.

Promote Circular Economy

Unlock bio-waste Recycling Routes

Foster Collaboration and Innovation

Build Awareness and Educate

ELEMENTS TO CATALYSE CHANGE

Suggest a financial mechanism to facilitate the adaptation of processes (EPR)

Establish a framework to guide which applications are suitable to be compostable

Explore innovations for processing of compostables in bio-waste recycling facilities

Provide clear labelling and communication practices

Insights in bio-waste recycling infrastructure in Europe

Suggest real world tests that could boost bio-waste recyclers' confidence in compostables

OUR KEY DELIVERABLES

A Framework and Best Practice Guide for Field-testing the Disintegration of Compostable Products and Packaging in Industrial Composting Facilities

Design recommendations for compostable packaging and products

Framework for EPR for compostable packaging and products

Bio-waste recycling infrastructure map for Europe

COMPOSTABLE BY DESIGN PLATFORM

WHAT'S COVERED

1. STANDARDS AND PRODUCT CERTIFICATION
2. COMPOSTING PROCESSES
3. COMPOST QUALITY
4. FIELD-TESTING GUIDANCE
5. EXISTING FIELD-TESTING PROTOCOLS

Pilot version V1.0 with external peer reviewers

Non-technical summary to be published Nov'25

FRAMEWORK AND BEST PRACTICE GUIDE FOR FIELD-TESTING THE DISINTEGRATION OF COMPOSTABLE PRODUCTS AND PACKAGING IN INDUSTRIAL COMPOSTING FACILITIES

Field-testing of the levels of disintegration under different ‘real-world’ conditions can be an important step to supplement laboratory testing, enabling composting facility operators to:

- Test the actual disintegration of compostable packaging and products within real-life conditions,
- Understand the impact of variable composting conditions, and
- Understand how compostable items will disintegrate during the composting process

Such field trials have been carried out for decades — including early tests in the 1990s — but often in an uncoordinated and non-standardized manner. This has made it difficult to compare and interpret results across sites and materials.

Establishing harmonized protocols for large-scale composting trials remains essential to ensure reliable assessment of disintegration performance under industrial conditions.

ACKNOWLEDGEMENTS

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Composting and Testing Experts:

AIMPLAS

BOKU University

Biomasse Suisse

Biodegradable Products Institute

Consorzio Italiano Compostatori

Cré

DIN CERTCO

Normec OWS

Renewable Energy Association (REA)

TUV Belgium, Austria

Anthesis Group and Ceres Waste, Renewables and Environment co-ordinated the workstream and led the development of this document in 2023/24 and 2024/25 respectively.

STANDARD AND PRODUCT CERTIFICATION

European standards EN 13432 and EN 14995 specify several tests that packaging or products must meet to be claimed suitable for industrial composting.

Biodegradation, heavy metal concentrations and ecotoxicity can only be tested in a laboratory.

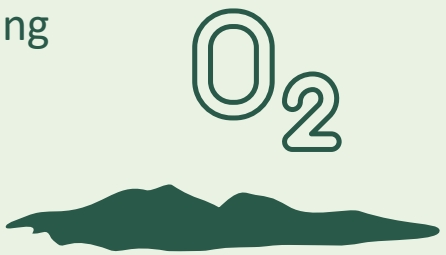
Field-testing is a direct way of assessing disintegration of compostable products and packaging in an operational industrial composting facility

Conducting field-testing trials within different facilities using different industrial composting methods can demonstrate disintegration across the varying operational conditions found in practice and enhance confidence across the bio-recycling and composting sector.

BIO-WASTE TREATMENT PROCESSES

Across Europe, there are typically two types of industrial bio-waste treatment.

Composting



Naturally occurring aerobic micro-organisms (bacteria and fungi) decompose organic material in the presence of oxygen, converting it into a stable organic residue (compost), carbon dioxide and water.

Anaerobic digestion

Naturally occurring anaerobic micro-organisms (bacteria) decompose organic material in the absence of oxygen, converting it into digestate and biogas. The anaerobic digestion treatment timescales are typically shorter than composting ones.

In Europe, the European Composting Networks stated that composting is the dominant method, accounting for approximately 59% of the total bio-waste processed, while anaerobic digestion is used for about 41%

TYPICAL COMPOSTING PROCESS & PARAMETERS

These are the stages of a typical industrial composting process

These are the key composting parameters

- Oxygen
- Volume, shape, porosity
- Aeration and turning frequency
- pH levels
- Moisture content
- Temperature and time
- Feedstock mixing ratios

FIELD TESTING GUIDANCE - CONSIDERATIONS

Technical competency

Test coordinators should possess a high level of technical competence before conducting field tests and should work in collaboration with an experienced composting site manager.

Location & partnership

An industrial composting operator is a key partner for field tests. They provide suitable space, equipment and professional site support, and must hold the necessary authorisations and permits for handling test samples.

Sample preparation & incorporation rates

The method of inputting compostable items must be reviewed as well as the ratio of the sample to the bio-waste mixture. Control samples are essential for creating valid reference points.

Operating parameters

Field trials should replicate standard industry conditions, including temperature, aeration, moisture content, pile shape, pile turning and turning frequency, where applicable.

Monitoring method

A structured approach to monitoring disintegration involves staggered retrieval of test samples throughout the composting process.

Disintegration data collection

Accurate collection of disintegration data is essential and should be carried out by experienced operators, with final evaluation performed by accredited laboratories.

COMPOST QUALITY

The EU Fertilizing Products Regulation (EU) 2019/1009 defines quality and safety criteria for composts and digestates marketed within the EU..

When certified compostable materials are properly disintegrated during the composting process, they do not affect compost quality or compliance with national or European quality assurance schemes.

The European Compost Network's Quality Assurance Scheme provides a pan-European framework for compost certification, complemented by national schemes in countries such as Austria, Flanders, Germany, Italy, or the UK.

Pan-European
ECN-QAS

Austria

Flanders, Belgium

Germany

Italy

UK

EXISTING FIELD TEST PROTOCOLS IN EUROPE

One of the oldest and most established is the "full-scale" test developed by the **Italian Biogas and Composting Association (CIC)**. This protocol is detailed in UNI-PdR-79:2020 and is an integral part of CIC's certification scheme for compostable products, known as "Compostabile CIC".

Similarly, **Cré, the Composting and Anaerobic Digestion Association of Ireland**, has developed its own certification scheme, which includes a dedicated field-testing protocol, to aid acceptance of compostable items at their members' facilities.

FOOD WASTE BIN COMPOSTABLE

cré IRELAND

COMPARATIVE OVERVIEW OF FIELD TEST PROTOCOLS

Criteria	CIC Test “full scale”	CRE	US - ASTM
Type of field-test	Mesh bags	Mesh bags	Mesh bags (D8619) and Dosing/loose (D6818)
Type of compostable item	Both paper and bioplastic based, Test used for items to be certified	Must be certified to EN 13432 and certification must apply to the product.	Both paper and bioplastic items that meet ASTM D6400 or equivalent.
Instructions about preparation of samples	Sample sizes reduced to pieces, 10 x 10 cm.	Samples tested whole.	No size reduction of sample. Samples are pre-soaked in water to simulate being food soiled.
Definition of the composition of input mixture of bio-waste (i.e. standard mixture)	Yes	Yes	Yes
Concentration/amount of samples inside composting	Minimum of 1% (fresh mass basis) placed samples in net bags	Samples tested whole in net bag containing 2 kg amount of bio-waste	Max 20% by volume.

COMPARATIVE OVERVIEW OF FIELD TEST PROTOCOLS

Criteria	CIC Test "full scale"	CRE	US - ASTM
Duration of disintegration or endpoint	12 weeks	On completion of batch in accordance with test site standard operating protocol.	No fixed time. Endpoint is when a stable and mature compost has been produced, or the sample disintegrates, whichever is first.
Sample collection for the field-test (i.e. who takes sample from the producer of the product to be tested)	Done on site of the applicant by a third-party certification body.	Samples supplied by applicant.	Not restricted.
Time temperature profile	Min values and frequencies of measurement defined.	Not defined, batch must be run in accordance with site's standard operating protocol.	Values defined, and frequency of measurement, for temperature, moisture, oxygen, C:N, bulk density, and pH.
Reference	UNI PdR 79:2020	N/A	ASTM D8618 and D8619

KEY MESSAGES FROM EXISTING FIELD TEST PROTOCOLS

- **Diverse but converging methods:** European and North American protocols differ in duration, sample prep and endpoints, yet all aim to assess disintegration under realistic industrial composting conditions
- **Compost maturity is key:** Certified compostable items disintegrate fully in facilities producing mature, biologically stable compost
- **Short-cycle limitations:** Facilities with short composting cycles may not create conditions sufficient for full disintegration, expectations should match process capabilities
- **Adaptive testing approaches:** Multiple short-cycle tests (recirculation) can simulate longer composting conditions
- **Need for harmonisation:** Standardising field-testing protocols across regions would enhance result reliability and mutual acceptance internationally

FRAMEWORK AND BEST PRACTICE GUIDE FOR FIELD-TESTING THE DISINTEGRATION OF COMPOSTABLE PRODUCTS AND PACKAGING IN INDUSTRIAL COMPOSTING FACILITIES

Collate a set of composting process parameters and conditions under which industrial compostability can be guaranteed

Support field testing alongside laboratory testing to verify results and create ‘real-world evidence’

Support communication measures and labelling to reassure users and consumers that appropriate collection and recycling options are being applied

Provide 'real world' evidence for the ongoing development of standards

Increase confidence in compostable items to be collected and processed as a valuable pathway for circular material flows

Support the design process of new compostable items informing on design and specifications

COMPOSTABLE BY DESIGN PLATFORM

CONTACT US

If you are interested in joining the CbDP or would like further information, please contact us.

CbDP Secretariat

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https://compostablebydesign.com/

https://www.linkedin.com/company/compostable-by-design-platform

Recognising that effective solutions require collective effort, the Platform brings leaders together from all segments of the compostable materials value chain.