Compostability testing

Scion's biodegradation facility measures the compostability of materials according to international standards.

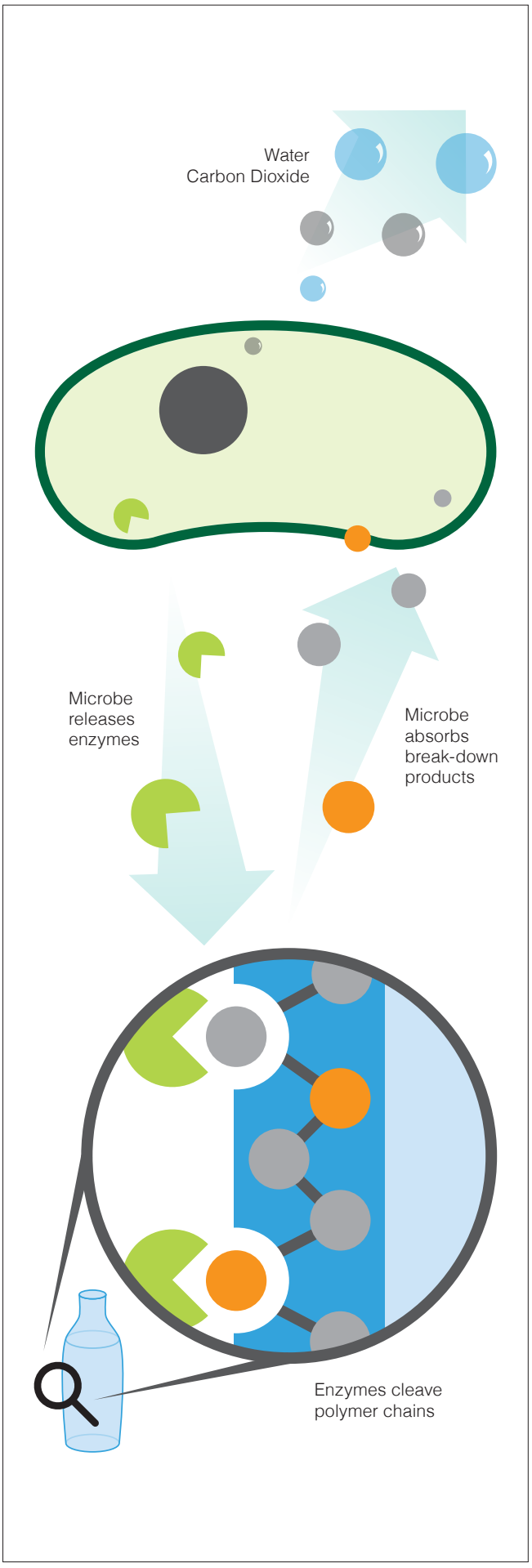
Scion has the capability to measure the compostability of a range of different materials. Internationally, several standards have been established that outline the tests required to validate if a material is compostable or not.

One component of compostability is biodegradation. Other standard tests include chemical characterisation, disintegration and ecotoxicity.

Compostability standards

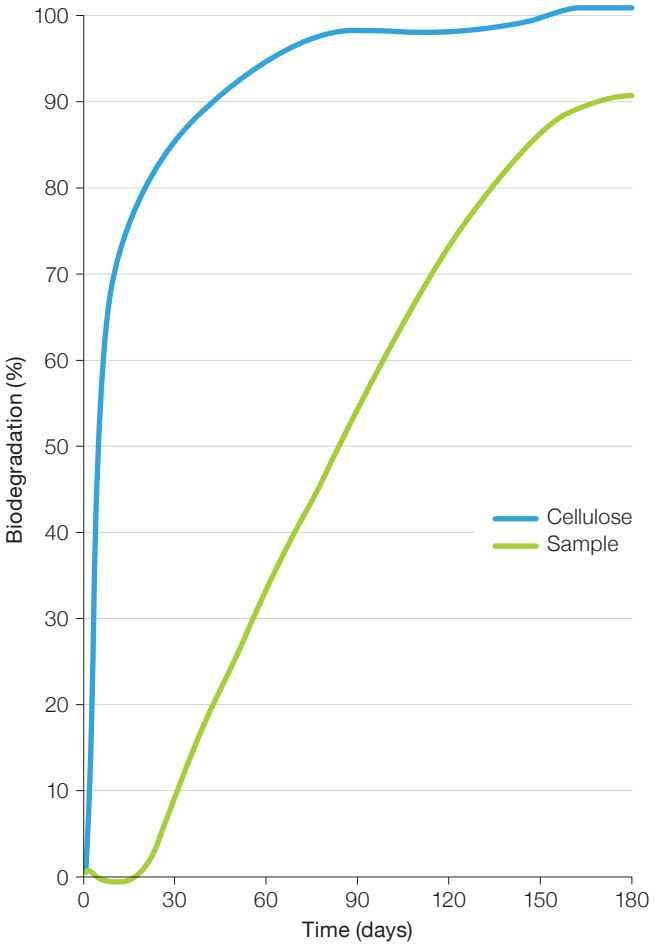
EN13432*	Packaging – Requirements for packaging recoverable through composting and biodegradation
EN14995*	Compostable plastics used in non-packaging applications
AS47636*	Biodegradable plastics – Biodegradable plastics suitable for compost and other microbial treatment
AS5810	Biodegradable plastics – Biodegradable plastics suitable for home composting
NFT51800*	Specification for plastics suitable for home composting
ASTM D6400	Labelling of plastics designed to be aerobically composted in municipal or industrial facilities
ASTM D6868	Labelling of end items that incorporate plastics and polymers as coatings or additives with paper and other substrates designed to be aerobically composted in municipal facilities
ISO 17088*	Specifications for compostable plastics
ISO 18606*	Packaging and the environment – organic recycling
BNQ 0017-988/2010	Compostable products – Certification protocol

*DIN CERTCO accredited



Biodegradation test

Ensures that the material is being broken down by naturally occurring microbes like bacteria, fungi and algae. This is achieved by measuring the cumulative CO_2 respired by the microbes as they consume the material.



Standard	Test temperature	Time	Pass criteria
Industrial composting	58 ± 2 °C	6 months	Sample must have degraded at least 90% of the starting carbon mass or alternatively at least 90% biodegradation relative to the cellulose control
Home composting	25 ± 2 °C	12 months	

Chemical characterisation test

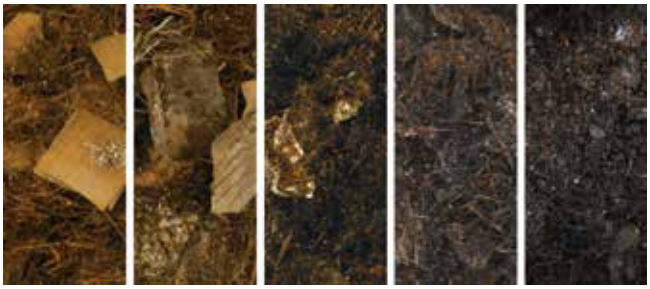
Ensures that the materials do not contain unacceptable levels of heavy metals and other toxic components.

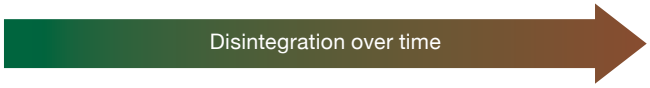
Generally, these standards all require fluorine and heavy metal testing (e.g. zinc, copper, nickel, cadmium, lead, mercury, chromium, molybdenum, selenium, arsenic). Specific limits are included in the standard or depend on the country the material will be sold and/or composted in.

There is also a requirement for the sample to contain at least 50% volatile solids.

Disintegration test

Ensures that the material reduces to a defined size within a fixed time to be considered a part of the compost.





Standard	Test temperature	Time	Pass criteria
Industrial composting	Max temp remains below 75°C during the first week and below 65°C for the following weeks. Temperature is above 60°C for at least 1 week, above 40°C for at least 4 consecutive weeks	84 days	No more than 10% of the sample dry weight remains after sieving with a 2mm sieve.
Home composting	25 ± 2°C	180 days	

Ecotoxicity test

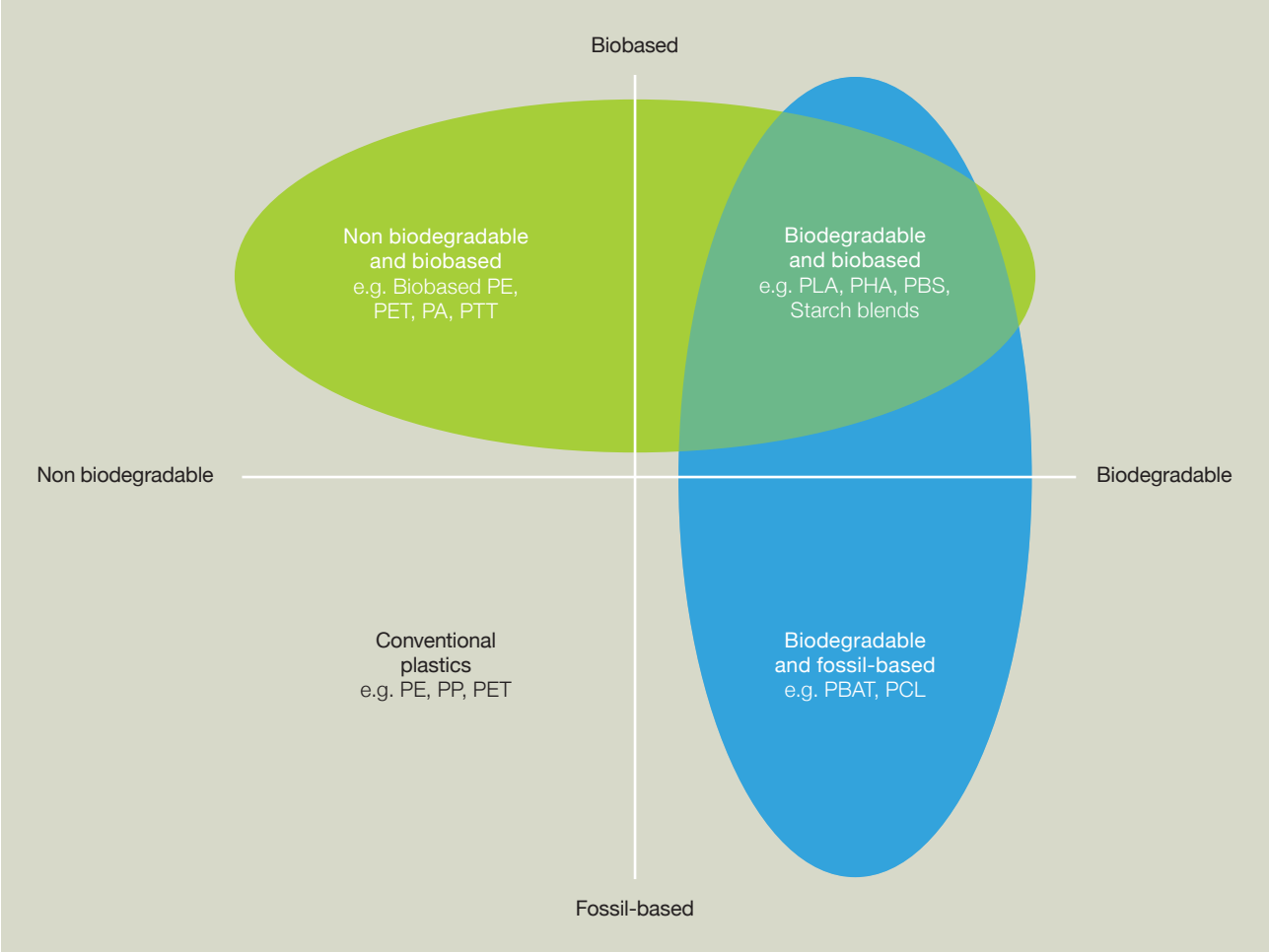
Ensures that the degraded material will not affect the compost quality and thus plant growth and soil ecosystem health.

All the standards use the compost from disintegration to compare seedling germination and growth to a control compost. The test compost germination rate and biomass weight has to be no less than 90% of seedlings from the control compost to pass. The Australian standards also includes a worm test where no more than 10% in morbidity or weight difference between the test compost and the control is allowed.

Biobased does not necessarily mean biodegradable/compostable

Biobased plastics are made from renewable resources such as trees, corn, potatoes and sugar cane etc, instead of fossil-based materials. But not all biodegradable plastics are biobased.

Examples of biobased plastics are polylactic acid (PLA) from starch and polyethylene (bioPE) from sugar cane. PLA is biodegradable and recyclable. BioPE, however, can only be recycled.



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About Scion

Scion is a New Zealand Crown research institute that specialises in research, science and technology development for forestry, wood and wood-derived materials, and other bio-material sectors.

Scion's purpose is to create economic value across the entire forestry value chain, and contribute to beneficial environmental and social outcomes for New Zealand.

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Prosperity from trees *Mai i te ngahere oranga*

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