

Industrial Compostability Testing

Background:

There are several international standards which can be used to determine if a material will be compostable in an industrial composting facility (e.g. EN 13432, AS 4736, ASTM D6400). There are also certified labelling schemes which have been developed to provide reliable and consistent information to consumers and composters. To use these labelling schemes (e.g. Australasian Bioplastics Association seedling, the European seedling and the Biodegradable Products Institute (BPI) logo) materials must be tested according to the relevant industrial compostability standard and then independently assessed by DINCERTCO to determine if the requirements of the relevant standard are met.

Testing Approach:

The standard test method has four main requirements, which all must be met to be fully accredited;

- The material must not contain unacceptable levels of fluorine and heavy metals (e.g. zinc, copper, nickel, cadmium, lead, mercury, chromium, molybdenum, selenium, arsenic), and the sample must contain at least 50% volatile solids, which is an indicator of organic content.
- While in a composting environment 90% of the materials carbon content must be converted into carbon dioxide within a 6-month period. This test is conducted at 58±2°C. The constituents of a material (e.g. polymers, inks, adhesives) can be tested independently, so may have already passed this requirement. FTIR is used to confirm the constituents in the starting material and compared against available data.
- The material in its finished form (including inks) must disintegrate during the composting process and at least 90% must be smaller than 2 mm within a 3-month time frame. This test is also conducted at temperatures which simulate an industrial composting environment. If the material is available in a range of thicknesses, then the results from its thickest form can be used to represent all thicknesses.
- Finally, the resulting compost from the disintegration trial is tested to ensure the degraded material will not affect plant growth and for AS4736 also earthworm health.

Standard Tests and Associated Pricing:

Tests	Test Duration	Mass required per sample	Cost per sample ¹
1 Characterisation			
FTIR and thickness	2 weeks	50g	\$170
Heavy metals	8 weeks	100g	\$729
Zn / Cu / Ni / Cd / Pb / Cr / Mo / Se / As	ISO 11885		
Hg	ISO 16772		
F	EN 15408		
Volatile solids	EN 12879	2 weeks	50g
			\$40
2 Biodegradability	ISO 14855-1	Min 3 months Up to 6 months	400g
			\$4,500 for the first 45 days plus \$290/week thereafter
3 Disintegration²	ISO 16929	3 months	1.5kg (in final form)
			\$9,174
4 Ecotoxicity – Seedling²	OECD 208	6 weeks	12kg (as powder <0.5mm)
			\$5,500
5 Ecotoxicity – Worm³	ASTM E1676	6 weeks	Uses sample above
			\$8,739

¹ Discount is applied to each additional sample, total cost will be confirmed on request

² Depending on capacity constraints can be subcontracted to partner lab

³ Subcontracted to partner lab