

ISO 17556:2019 (E)

Plastics — Determination of the ultimate aerobic biodegradability of plastic materials in soil by measuring the oxygen demand in a respirometer or the amount of carbon dioxide evolved

Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
4	Principle
5	Test environment
6	Materials
7	Apparatus
8	Procedure
8.1	Preparation of the test material
8.2	Preparation of the reference material
8.3	Preparation of the test soil
8.3.1	Collection and sieving of soil
8.3.2	Preparation of standard soil
8.3.3	Measurement of soil characteristics
8.3.4	Adjustment of the water content and the pH of the soil
8.3.5	Handling and storage of the soil
8.4	Start-up and execution of the test
9	Calculation and expression of results
9.1	Calculation
9.1.1	Percentage biodegradation from oxygen consumption values
9.1.2	Percentage biodegradation from carbon dioxide evolved
9.1.2.1	Theoretical amount of carbon dioxide evolved by test material
9.1.2.2	Percentage biodegradation
9.2	Expression and interpretation of results
10	Validity of results
11	Test report
Annex A	(informative) Principle of a manometric respirometer (example)
Annex B	(informative) Example of a system for measuring the amount of carbon dioxide evolved
Annex C	(informative) Examples of methods for the determination of evolved carbon dioxide
C.1	CO ₂ determination by DIC measurement
C.2	Titrimetric method using a barium hydroxide solution
Annex D	(informative) Theoretical oxygen demand (ThOD)
D.1	Calculation of ThOD

- D.2 Example: poly-(R)-3-hydroxybutyrate [(R)-PHB]
- D.3 Example: blend of polyethylene/starch/glycerol
- Annex E (informative) Example of a determination of the amount and the molecular mass of water-insoluble polymer remaining at the end of a biodegradation test
- Annex F (informative) Examples of long-term tests
 - F.1 Evolution of the biodegradation of cellulose, wheat gluten, flax fibres and broom fibres in soil
 - F.2 Evolution of the biodegradation of cellulose, birch leaves, oak leaves and pine needles in soil
 - F.3 Evolution of the biodegradation of cellulose and straw
- Annex G (informative) Interlaboratory test

Page count: 26