

Australian Standard[®]

**Biodegradability—Organic
compounds in an aqueous medium**

**Part 8: Determination by static test
(Zahn-Wellens method)**

[ISO title: Water quality — Evaluation of the aerobic biodegradability
of organic compounds in an aqueous medium — Static test
(Zahn-Wellens method)]

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The following interests are represented on Committee MS/56:

Australian and New Zealand Environment and Conservation Council
Australian Chemical Specialties Manufacturers Association
Australian Conservation Foundation
Australian Federation of Consumer Affairs
Federal Bureau of Consumer Affairs
Friends of the Earth
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National Association of Testing Authorities, Australia
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PREFACE

This Standard was prepared by the Standards Australia Committee MS/56 on Biodegradability of Materials. It is technically equivalent to ISO 9888:1991, *Water quality—Evaluation of the aerobic biodegradability of organic compounds in an aqueous medium—Static test (Zahn-Wellens method)*.

This is Part 8 in a series of Standards which give guidance and methods to determine the biodegradability of organic compounds in an aqueous medium with the objective of specifying a method for the determination of the 'inherent' biodegradability of an organic compound at a given concentration by aerobic microorganisms. Determination of the percentage removal of dissolved organic carbon (DOC) or chemical oxygen demand (COD) at regular intervals allows evaluation of the biodegradability of the test compound.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

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STANDARDS AUSTRALIA

Australian Standard

Biodegradability—Organic compounds in an aqueous medium

Part 8: Determination by static test (Zahn-Wellens method)

1 SCOPE This Standard specifies a method for the evaluation of the elimination and the 'inherent' biodegradability of organic compounds, at a given concentration, by aerobic microorganisms.

The conditions described in this Standard normally correspond to optimal conditions for allowing the maximum value of biodegradation to occur with the chosen inoculum in the test time.

The method applies to organic compounds which are—

- (a) soluble at the concentration used under the test conditions;
- (b) non-volatile, or which have a negligible vapour pressure under the test conditions;
- (c) not lost by foaming from the test solution; and
- (d) not inhibitory to the test microorganisms at the concentration chosen for the test. Inhibitory effects can be determined by using a suitable test method (e.g. see ISO 8192). If the test compound is toxic, the test concentration has to be lower or a pre-exposed inoculum can be used.

The method can also be used to measure the elimination and biodegradation of organic compounds in waste water (also called 'test compound' in the method).

WARNING AND SAFETY PRECAUTIONS: ACTIVATED SLUDGE AND SEWAGE, MAY CONTAIN POTENTIALLY PATHOGENIC ORGANISMS. THEREFORE, APPROPRIATE PRECAUTIONS SHOULD BE TAKEN WHEN HANDLING THEM. TOXIC TEST COMPOUNDS AND THOSE WITH UNKNOWN PROPERTIES SHOULD BE HANDLED WITH CARE.

2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

- 4351 Biodegradability —Organic compounds in a aqueous media
4351.3 Part 3: Determination by oxygen demand in a closed respirometer
4351.4 Part 4: Determination by analysis of released carbon dioxide

ISO

- 6060 Water quality—Determination of the chemical oxygen demand
8192 Water quality—Test for inhibition of oxygen consumption by activated sludge
8245 Water quality—Guidelines for the determination of total organic carbon (TOC)

3 DEFINITIONS For the purpose of this Standard, the definitions below apply.

3.1 Concentration suspended solids (of an activated sludge)—the amount of solids obtained by filtration or centrifugation of a known volume of sludge under specified conditions and drying at 105°C to constant weight.