

The Australian Ecolabel Program Good Environmental Choice Australia Standard

Compostable Biopolymer Products



ISSUED BY GOOD ENVIRONMENTAL CHOICE AUSTRALIA LTD
PO BOX 4140, WESTON CREEK ACT 2611
PHONE: +61 (02) 6287 3100
FAX: +61 (02) 6287 3800
E-MAIL: OFFICE@GECA.ORG.AU

Use of This Standard

This voluntary environmental labelling standard may be used by competent environmental assessors to establish product compliance to the Australian Ecolabel Program. Products that are certified with the mark of conformity, the "Good Environmental Choice Label" have been independently tested and demonstrate compliance to the environmental and social performance criteria detailed in this standard. The overall goal of environmental labels and declarations is the communication of verifiable and accurate information, which is not misleading, on environmental aspects of products and services. This encourages the demand for, and supply of, those products and services that cause less stress on the environment, thereby stimulating the potential for market-driven continuous environmental improvement.

This standard identifies environmental, quality, regulatory and social performance criteria that products sold on the Australian market can meet in order to be considered as good "environment practice". Products that have been certified as complying to this standard may gain greater market recognition and a marketing advantage in government and business procurement programs, as well as broad consumer preference.

This standard can be used by Australian producers to guide their designs for environment programs by using the environmental criteria as key performance benchmarks to reduce the environmental loads of their product. The standard is necessarily restricted in its identification of environmental loads from the product life-cycle. Producers should consider other environmental measures along the product cycle, which are not included in this standard, in their environment program designs for and aim for even higher levels of environmental performance where technically possible.

For further information please contact:

Good Environmental Choice Australia Ltd
Standards Review and Development
Ph: +61 (2) 6287 3100
E-mail: standards@geca.org.au

This document may be copied only in its entirety and without any type of change. Quotations may be made provided that Good Environmental Choice Australia Ltd is stated as the source. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Good Environmental Choice Australia Ltd
PO Box 4140, Weston Creek ACT, 2611, Australia.
Printed in Australia

CONTENTS

ABSTRACT.....	4
DEFINITIONS.....	4
1 INTRODUCTION.....	6
1.1 PURPOSE.....	6
1.2 BACKGROUND.....	6
2 STANDARD CATEGORY SCOPE.....	7
3 ENVIRONMENTAL PERFORMANCE CRITERIA.....	8
3.1 FITNESS FOR PURPOSE.....	8
3.2 MATERIAL REQUIREMENTS.....	8
3.3 HAZARDOUS MATERIALS.....	9
3.4 BIODEGRADABILITY.....	10
3.5 LABELLING.....	10
4 COMPLIANCE TO ENVIRONMENTAL REGULATIONS.....	11
5 COMPLIANCE TO LABOUR, ANTI-DISCRIMINATION AND SAFETY REGULATIONS.....	11
6 COMPLIANCE TESTING.....	12
6.1 AUDIT METHODOLOGY.....	12
6.2 ASSESSOR COMPETENCY.....	12
6.3 SUITABLE SOURCES.....	12
6.4 LABORATORY TESTING.....	12

GOOD ENVIRONMENTAL CHOICE AUSTRALIA STANDARD

Compostable Biopolymer Products

Current Status: Final Standard Version 1.2

Date Published: 05 September 2007

First Published: 29 July 2005 (Version 1.1)

Abstract

This Standard specifies environmental performance requirements of compostable biopolymer products for the Australian Ecolabel Program. The Australian Ecolabel Program complies with ISO 14024: "Environmental labels and declarations - Guiding principles" which requires environmental labelling specifications to include criteria that are objective, reasonable and verifiable.

Definitions

Biopolymer refers to a material that is partially comprised of natural starch additives with the characteristics of a plastic product.

Degradable plastic refers to a plastic designed to undergo a significant change in its chemical structure under specific environmental conditions resulting in a loss of plastic properties. Changes and degradations are measured by standard test methods appropriate to the particular material.

Biodegradable plastic refers to a degradable plastic in which the degradation results from the action of naturally-occurring micro-organisms such as bacteria, fungi and algae. This plastic type is classed as a biopolymer.

Photodegradable plastic refers to a degradable plastic in which the degradation results from the action of natural daylight.

Oxidatively degradable plastic refers to a degradable plastic in which the degradation results from oxidation.

Hydrolytically degradable plastic refers to a degradable plastic in which the degradation results from hydrolysis.

Compostable plastic refers to a plastic that undergoes degradation by biological processes during composting to yield carbon dioxide, water, inorganic compounds, and biomass at a rate consistent with other known, compostable materials and leaves no other distinguishable or toxic residue.

Relevant Standards or Test Methods to this Standard include:

ASTM D 5338 Standard Test Method for Determining Aerobic Biodegradation of Plastics Materials under Controlled Composting Conditions, September 1998

ASTM D 6002 Standard Guide for Assessing the Compostability of Environmentally Degradable Plastics, October 1996.

ASTM D 6400 Standard Specification for Compostable Plastics, May 1999

EN 13432 Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging - December 2000

- EN ISO 11734** Water quality - Evaluation of the "ultimate" anaerobic biodegradability of organic compounds in digested sludge - Method by measurement of the biogas production, November 1998
- DIN V 54900-1** Testing of compostability of plastics - Part 1: Chemical testing, October 1998
- DIN V 54900-2** Testing of the compostability of plastics - Part 2: Testing of the complete biodegradability of plastics in laboratory tests, September 1998
- DIN V 54900-3** Testing of the compostability of plastics - Part 3: Testing under practice-relevant conditions and a method of testing the quality of the composts, September 1998
- DIN 54900-4** Testing of the compostability of polymeric materials – Part 4: Testing of ecotoxicity of composts, January 1997
- ISO 14851** Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium – Method by measuring the oxygen demand in a closed respirometer, May 1999
- ISO 14852** Determination of the ultimate aerobic biodegradability of plastics materials in an aqueous medium – Method by analysis of evolved carbon dioxide, May 1999
- ISO 14855** Determination of the ultimate aerobic biodegradability and disintegration of plastic materials under controlled composting conditions – Method by analysis of evolved carbon dioxide, May 1999
- ISO/DIS 14853** Plastics-Determination of the ultimate anaerobic biodegradability in an aqueous system – Method by measurement of biogas production, April 1999
- ISO/DIS 15985** Plastics-Determination of the ultimate anaerobic biodegradability and disintegration under high-solids anaerobic-digestion conditions - Method by analysis of released biogas, April 1999

1 INTRODUCTION

1.1 Purpose

This Standard seeks to define good environmental performance benchmarks for compostable biopolymer products. The voluntary environmental labelling standard implemented by Good Environmental Choice Australia (GECA) as part of the Australian ecolabel program specifies environmental performance criteria for a range of compostable biopolymer products including, but not limited to, shopping bags, agricultural supplies, fishing tackle and sanitary products. This standard stipulates the environmental load of such products throughout the major aspects of their life cycle.

1.2 Background

While biopolymers were specifically designed to decrease the environmental problems caused by the use of petroleum-based polymers, they still have specific environmental loads which have the potential to cause significant environmental problems. In particular there appear to be a broad range of biopolymer product types with differences in biodegradability under differing circumstances, percentages of starch materials, a large range of additives of non-natural origin and significant use of genetically engineered organisms in starch content. There are also a range of environmental impacts associated with growing corn, potatoes or other crops for starch or fibre production including land clearing, eutrophication, land-degradation and the use of biocides.

Within the range of biopolymer products it is evident that under certain production and use conditions some biopolymer types are environmentally preferable to others. As the technology advances and biopolymer products are increasingly regulated by industry or government standardisation they will over time demonstrate better environmental characteristics than their traditional plastic counterparts. At this time the environmental distinction is unclear and only certain types of biopolymers exhibit environmental preference under certain use conditions. In some cases biopolymers demonstrate similar or worse environmental performance to recycled plastic products when whole of life considerations are taken into account. Recycled plastic products are also recognised by the Good Environmental Choice Label under the Recycled Plastic Products Standard.

This Standard seeks to identify the production and consumption conditions of environmentally preferable types of biopolymers and to define environmental performance criteria for the most harmful environmental and human health hazards of biopolymer products.

This Standard aims in particular at promoting biopolymers as substitutes to plastic or metal materials where there are production controls and product design demonstrating:

- Minimization of land-use impacts from the agricultural phase.
- Minimisation of environmentally hazardous substances during manufacturing.
- The use of the most completely biodegradable components.
- Declaration of good environmental performance levels of waste emissions on non-degradable material.
- Restriction on the use of genetically modified organisms.

2 STANDARD CATEGORY SCOPE

This standard is applicable to the following categories of biopolymer products:

- Rubbish bags
- Shopping bags
- Agricultural and horticultural products
- Food packaging and containers
- Non-food packaging and containers
- Sanitary products
- Stationery
- Fishing equipment

Other innovative product applications where biopolymer substitutes for plastic or metal components results in demonstrable environmental benefit will be considered for certification provided the product fulfils the requirements of any relevant sections of this Standard.

3 ENVIRONMENTAL PERFORMANCE CRITERIA

3.1 Fitness for Purpose

Certified products should be good performers in their intended application. Certain standards of quality and durability are implicit in the Label. The manufacturer must ensure that the product is fit for its intended purpose and:

3.1.1 Applicable Standards

The product meets or exceeds the requirements of the relevant Australian Standard, or the product meets the applicable and accepted standard in its target market if it is to be exported, or

3.1.2 Demonstrated Performance

If there is no relevant Australian Standard, the product can demonstrate sufficient quality by providing testing reports from an independent organisation or case studies from installations demonstrating market suitability and quality.

3.2 Material Requirements

3.2.1 Fibre Sources

Fibre may be sourced from any combination of FSC or AFS certified fibre, plantation wood fibre, cellulose fibre, return fibre, cotton fibre, crop residue or other waste fibre. Any sources that are not certified under a recognised certification scheme (e.g. FSC) as being sustainably managed shall not originate from:

- a. *Illegal harvesting*
Illegally harvested wood and natural materials are those that are harvested, traded or transported in a way that is in breach with applicable national regulations (such regulations can for example address CITES species, money laundering, corruption and bribery, and other relevant national regulations).
- b. *Genetically modified organisms*
Wood and natural materials from genetically modified organisms are those which have been induced by various means to include genetic structural changes (for a definition of genetically modified, please refer to the European Union Directive 2001/18/EC on the deliberate release of genetically modified organisms in the environment). Traditional breeding programs do not constitute genetic modification.
- c. *Recently established plantations impacting primary ecosystems*
The plantation or agricultural land use must have been established prior to 2000 and not have impacted primary ecosystems at the time of establishment. Establishment includes the logging or destruction of primary forest followed by the establishment of the plantation.
- d. *Uncertified high conservation value communities*
High Conservation Value communities are those that possess one or more of the following attributes:
 - Communities containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia); and/or large landscape level communities, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.
 - Communities that are in [constitute] or contain rare, threatened or endangered ecosystems.

- Communities fundamental to meeting basic needs of locally indigenous human populations (e.g. subsistence, health) and/or critical to these people's traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

For materials sourced from within Australia, please refer to the following:

The EPBC Act List of Threatened Fauna at

<http://www.deh.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=fauna>

The EPBC Act List of Threatened Flora at

<http://www.deh.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=flora>

The EPBC Act List of Threatened Ecological Communities

<http://www.deh.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl>

The Australian Heritage Database (for listings of areas of cultural significance) at

<http://www.deh.gov.au/cgi-bin/ahdb/search.pl>

For materials sourced from outside Australia, please refer to credible lists detailing threatened species, threatened communities and areas of cultural significance in the respective countries.

3.2.2 Material Content

The product must have a minimum natural material or starch content of 30%

Plastic additives must not include more than 40% aromatic polyesters or other degradable plastics by weight.

3.2.3 Coatings and Waterproofing Treatments

No product or component may be impregnated, labelled, coated or otherwise treated in a manner which would prevent biodegradation under the conditions of disposal.

Paints, coatings and waterproofing treatments used in certified products must be certified by the Good Environmental Choice Label, the EU Flower label, the New Zealand Environmental Choice Label or the Nordic Swan label or satisfy the requirements of GECA Standard No. 23 – Architectural and Protective Coatings.

3.3 Hazardous Materials

3.3.1 Prohibited Substances

The following compounds, their functional derivatives or in-situ precursors shall not be added to finished products, their component parts or be used at any stage of the manufacturing process, including as preparatory agents, cleaners or degreasers in the production facility:

Halogenated organic substances or solvents (e.g., binding agents, polybrominated diphenyl ethers, or brominated paraffins, short-chain chlorinated paraffins).

Fluoropolymer additives or coatings.

Aniline based amines.

The phthalates DEHP, DBP, DAP or BBP.

Aziridine or polyaziridines.

Pigments and additives that contain lead, tin, arsenic, cadmium, mercury or their compounds.

CFC, HCFC, HFC or any ozone depleting substances.

3.3.2 Human Health Exposure

The product shall not be capable of exposing users to carcinogenic substances in categories 1 or 2A as classed by the International Agency for Research on Cancer – <http://www.iarc.fr>.

The product shall not be capable of exposing users to substances in category 2B of the same classification scheme at levels greater than 5 % of the limits set by the Australian National Occupational Health and Safety Commission.

The product shall not contain more than 0.2% by weight (in total) of any substance classified as mutagenic or teratogenic by the Australian National Industry Chemical Notification and Assessment Scheme (NICNAS).

3.3.3 Contaminants

Contaminant levels shall be limited to one of the following internationally determined benchmarks for compostable biopolymers:

Table 1: Maximum contaminant limits for biopolymer products. All values are in mg / kg of polymer.

	DIN V 54900-1 (German)	EN 13432 (EU)	Green Plastics (Japanese)
Chemical	Limit values	Limit values	Limit values
Zn	100	150	150
Cu	23	50	37.5
Ni	15	25	25
Cd	0.3	0.5	0.5
Pb	30	50	50
Hg	0.3	0.5	0.5
Cr	30	50	50
Mo	-	1	1
Se	-	0.75	0.75
As	-	5	3.5
F	-	100	100

Note: The limits specified in ASTM D 5338 is *not* accepted as suitable benchmarks for this criterion.

3.4 Biodegradability

The biodegradability of the product must meet the requirements of EN 13432 or DIN V 54900 1-5 using test methods ISO 14851, ISO 14852 or ISO 14855, or equivalent.

3.5 Labelling

3.5.1 Product Information

The product must be labelled or supplied with the following information:

- The most appropriate disposal options in order to minimise the environmental impact of disposal (e.g., controlled composting, dissolution in an aqueous medium, etc).
- If the product is not expected to degrade under typical landfill conditions, this must be clearly stated.
- If a “biodegradable” product is not expected to degrade under typical domestic compost conditions, this must be clearly stated.

4 COMPLIANCE TO ENVIRONMENTAL REGULATIONS

The applicant is required to comply with relevant environmental legislation and government orders at the Local, State, and Commonwealth levels, if these have been issued. An applicant's compliance with these criteria may be established by undertaking a series of random checks; and/or by gathering samples of applicant operational procedures and documents from approved assessors as evidence to support compliance during the verification. Where an applicant is from an overseas jurisdiction, that jurisdiction's environmental regulations apply. Where the applicant is subject to a guilty verdict by a legally constituted court in the last 24 months on the basis of a breach of any environmental legislation or permits, there must be evidence of corrective action.

5 COMPLIANCE TO LABOUR, ANTI-DISCRIMINATION AND SAFETY REGULATIONS

An applicant shall demonstrate that all employees are covered by a Federal or State award or a certified industrial agreement or a registered workplace agreement as determined by the Industrial Relations Commission, the Employment Advocate or a State or Territory Workplace Relations Agency or a workplace agreement in compliance with Workplace Relations Act 1996 Part 7 – The Australian Fair Pay and Conditions Standard.

An applicant shall demonstrate general compliance to the terms of State or Territory Legislation concerning Occupational, Health and Safety and/or the *Commonwealth Safety, Rehabilitation and Compensation Act 1988*, where applicable. Where the applicant is subject to a breach order by a government agency, or a guilty verdict by an Australian Court within the last 24 months, on the basis of a breach of State, Territory or Commonwealth Occupational, Health and Safety Legislation, there must be evidence of corrective action.

The applicant shall demonstrate general compliance to the requirements of the Racial Discrimination Act 1975, Sex Discrimination Act 1984, Disability Discrimination Act 1992, Equal Opportunity for Women in the Workplace Act 1999, and complementary State Legislation. Applicants cannot be in the list of 'named' or non-compliant employers under the Equal Opportunity for Women in the Workplace Act 1999. Where the applicant is subject to a breach order by a government agency, or a guilty verdict by an Australian Court in the last 24 months on the basis of a breach of these Acts, there must be evidence of corrective action.

Where an applicant is from an overseas jurisdiction, the applicant shall demonstrate general compliance to that jurisdiction's anti-discrimination, occupational health and safety, and workers' compensations regulations. Where the applicant is subject to a breach order by a government agency, or a guilty verdict by a legal court in their respective country within the last 24 months on the basis of a the breach of anti-discrimination, occupational health and safety, and workers' compensation regulations, there must be evidence of corrective action.

An applicant's compliance with these criteria may be established by undertaking a series of random checks; gathering samples of applicant operational procedures and documents from approved assessors; and/or by providing a self-declaration document signed by an executive officer of the applicant organisation as evidence to support compliance during verification.

6 COMPLIANCE TESTING

6.1 Audit Methodology

Conformance with this standard shall be demonstrated by undertaking an assessment under the above criteria by an approved assessor, following the certification and verification procedures detailed in the Good Environmental Choice Australia Ltd Documented Quality Management System, which generally follows the environmental auditing requirements of ISO 14 011 and 14 012.

6.2 Assessor Competency

The Australian Ecolabel Program classifies approved assessors as:

- a. Assessors registered by Good Environmental Choice Australia Ltd as environmental professionals that hold expertise relevant for an assessment, and who have undertaken training in the procedures of the Australian Ecolabel Program; or
- b. Environmental auditors accredited with the RABQSA.

6.3 Suitable Sources

Audit evidence should be of such a quality and quantity that competent environmental auditors, working independently of each other, will reach similar audit findings from evaluation of the same audit evidence against the same audit criteria.

Suitable sources of information to establish compliance may be, but are not limited to:

- a. Technical specification of the product.
- b. Obvious characteristics of the product under examination.
- c. Scientific test results and reports.
- d. Environmental management system and audit reports and results.
- e. Life-cycle assessment of each stage of the product life-cycle via a physical audit and examination.
- f. Life-cycle assessment via scientific testing.
- g. A statement of confirmation by an executive officer.
- h. An assessment of company or government records.
- i. Other material that can be considered objective evidence.

6.4 Laboratory Testing

New testing shall be undertaken by a laboratory accredited by the National Association of Testing Authorities (NATA), or similar overseas accreditation agents who can conduct the relevant tests and/or provide documentation detailing environmental performance against the criteria of this standard. The test results should be presented on NATA-endorsed reports or from a laboratory acceptable to Good Environmental Choice Australia Ltd.

If test results or environmental auditing results are not available, and/or there is insufficient data to establish full compliance with the criteria required by this standard, then certification cannot be awarded.