Hong Kong Green Label Scheme
Product Environmental Criteria for
Oxo-biodegradable Plastic Products - Food / Drink
(GL-005-011)

GREEN COUNCIL 環保促進會

BACKGROUND

The Hong Kong Green Label Scheme (HKGLS) is an independent and voluntary scheme, which aims to identify products that are, based on life cycle analysis consideration, more environmentally preferable than other similar products with the same function. The Scheme is organized by the Green Council (GC) with contributions from the HKGLS Advisory Committee and a number of supporting organizations.

The prime objectives of HKGLS are:

- For Consumers: assist in making purchases of products that are less harmful to the environment;
- For Industry: stimulate development and production of environmentally preferable alternatives.

This specification sets out the requirements that Oxo-biodegradable Plastic Products for food and drink will be required to meet in order to be licensed to use the HKGLS label. The requirements include environmental criteria and product characteristics. The specification also defines the testing and other means to be used to verify conformance with the environmental criteria and product characteristics.

POTENTIAL ENVIRONMENTAL IMPACTS

Plastic wares account for about 20% of the total weight of municipal solid waste disposed of in landfills in Hong Kong, with plastic bags and expanded polystyrene (EPS) products (e.g. containers and packaging materials) making up the most significant portion. These plastic materials do not decompose and remain in the earth for a long time, thereby polluting the earth and creating environmental problems. The use of degradable plastic products could alleviate the loading of landfill sites.

LABEL OBJECTIVE

The aim of the environmental criteria developed for oxo-biodegradable plastic products is to:

- Promote the use of degradable materials.
- Reduce the amount of plastic entering the waste stream.

PRODUCT DEFINITION

This document and all product environmental criteria therein apply to all oxo-biodegradable plastic products for food and drink which biodegrade in the open environment owing to the inclusion of a pro-degradant additive.

The table below sets out the environmental criteria for the product category of Oxo-biodegradable Plastic Products for food and drink (GL-005-011) under the HKGLS.

Product Environmental Criteria	Verification Method(s)*
1. Separate abiotic degradation tests shall be performed, by UV ageing, or Heat Ageing to simulate the degradation processes.	✓ Review of laboratory test report(s) according to ASTM D6954 Tier 1: ✓ UV Ageing: The test is performed according to ASTM D5208 Cycle C or ASTM D5071. ✓ Heat Ageing: The test is performed according to ASTM D5510.
2. The extent of degradation shall be evaluated by measuring the loss in mechanical properties, decrease in viscometry molecular weight, and determination of gel content. At the end of each test period the samples should show: – Average viscometry molecular weight < 5,000 g/mole (Daltons) – Gel Fraction < 5%	✓ Review of laboratory test report(s) ✓ Molecular weight: ASTM D6474 or ASTM D5296 or equivalent. ✓ Gel Fraction: ASTM D2765 or equivalent.
3. For Polyethylene (PE) and Polypropylene (PP) film with thickness less than 1mm: Elongation-at-break of at least 75% of the test samples at the initial strain of 0.1 mm/ (mm · min) should be 5% or less.	✓ Review of laboratory test report(s) according to ASTM D3826 or equivalent.
4. The levels of the following hazardous substances as impurities shall not exceed the following: Lead: 1,000 ppm Mercury: 1,000 ppm Cadmium: 100 ppm Chromium VI: 1,000 ppm Polybrominated biphenyls (PBB): 1,000 ppm Polybrominated diphenyl ethers (PBDE): 1,000 ppm	✓ Review of laboratory test report(s); ✓ In compliance with RoHS standard
5. The following substances shall not knowingly be incorporated into the manufacturing process or final product:	✓ A declaration to this effect signed by the CEO or

Product Environmental Criteria	Verification Method(s)*
Carcinogens Mutagens Endocrine disruptors such as phthalates & reproductive toxins	Technical Director of the applicant company
6. Consumer information The product shall include printed information on length of useful life and disposal, as well as the storage conditions.	✓ Review of supporting information; AND ✓ Inspection of product samples
7. Degradability The percent biodegradation of the product material shall be ≥60% within 24 months.	✓ Review of laboratory test report(s) ✓ Biodegradation test according to ASTM D6954 Tier 2: ASTM D5526 or D5338 or D5988 or ISO17556 or equivalent.
8. Ecological impact The residue was tested for eco-toxicity.	✓ Review of laboratory test report(s) according to ASTM D6954 Tier 3 ✓ Ecological Impacts: ASTM D5951 or equivalent.
9. Production processes shall conform to relevant national or local environmental regulations on preventing air, water and waste pollution.	✓ Review of supporting information; AND ✓ Interview with relevant personnel. (i.e.: ISO 14001; ISO 9001)
10. Food contact For products intended for direct contact with food the product shall comply with the following: – European Commission Regulation No 1935/2004 or the relevant provisions of the United States FDA Code of Federal Regulations.	✓ Review of laboratory test report(s) according to EC 1935/2004 or FDA or equivalent; AND
11. Packaging requirements:	✓ Inspection of product samples;

Product Environmental Criteria	Verification Method(s)*
General packaging requirement (Refer to criteria for packaging materials: GL-Packaging).	AND ✓ Review of supporting information; AND ✓ Interview with relevant personnel.

*Analytical testing should be accredited and performed by laboratories that meet the requirement laid out in the IEC/ISO 17025 standards or any equivalent systems e.g. HOKLAS, CNAS. Under special situation and with the approval from GC, test can be performed by in-house method by the accredited laboratory or manufacturer.

List of Test Methods

i) D882 Standard Test Method for Tensile Properties of Thin Plastic Sheeting
ii) D2765 Standard Test Methods for Determination of Gel Content and Swell Ratio of Crosslinked Ethylene Plastics
iii) D3335 Standard Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy
iv) D3826 Standard Practice for Determining Degradation End Point in Degradable Polyethylene and Polypropylene Using a Tensile Test
v) D5071 Standard Practice for Exposure of Photodegradable Plastics in a Xenon Arc Apparatus
vi) D5208 Standard Practice for Fluorescent Ultraviolet (UV) Exposure of Photodegradable Plastics
vii) D5296 Standard Test Method for Molecular Weight Averages and Molecular Weight Distribution of Polystyrene by High Performance Size-Exclusion Chromatography
viii) D5338 Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions, Incorporating Thermophilic Temperatures
ix) D5510 Standard Practice for Heat Aging of Oxidatively Degradable Plastics
x) D5526 Standard Test Method for Determining Anaerobic Biodegradation of Plastic Materials Under Accelerated Landfill Conditions
xi) D5951 Standard Practice for Preparing Residual Solids Obtained After Biodegradability Standard Methods for Plastics in Solid Waste for Toxicity and Compost Quality Testing

xii) D5988 Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in Soil

xiii) D6400 Standard Specification for Labeling of Plastics Designed to be Aerobically Composted in Municipal or Industrial Facilities

xiv) D6474 Standard Test Method for Determining Molecular Weight Distribution and Molecular Weight Averages of Polyolefins by High Temperature Gel Permeation Chromatography

xv) D6954 Standard Guide for Exposing and Testing Plastics that Degrade in the Environment by a Combination of Oxidation and Biodegradation

xvi) ISO 17556:2012 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