

For information

Legislative Council Panel on Environmental Affairs

Testing Guideline on the Degradability and Food Safety of Containers and Bags

Purpose

This paper informs Members of the introduction of a guideline to test the degradability and food safety of containers and bags that are claimed to be degradable, and a registration scheme for degradable products that meet the testing guideline.

Background

2. At the LegCo Motion Debate held on 22 June 2000, Members were informed that a Working Group had been set up to develop a guideline for testing the degradability and safety of products that were claimed to be degradable, and that the guideline was expected to be completed in late 2000. The Working Group comprises the Environmental Protection Department (EPD), Consumer Council, Hong Kong Association of Certification Laboratories Ltd, Hong Kong Expanded Polystyrene Association Ltd, Hong Kong Plastic Bags Manufacturers' Association, Hong Kong Plastics Technology Centre Ltd, Hong Kong University of Science and Technology, and the Food and Environmental Hygiene Department.

3. In the progress report issued in September 2000, Members were informed that in addition to developing the testing guideline, the Working Group was also formulating a registration system for degradable products that could meet the testing criteria for public information.

Testing Guideline and Registration Scheme

4. The testing guideline has now been completed. The guideline addresses three major aspects – food safety (for food and drink containers/bags), degradability and physical performance. The registration scheme for degradable containers and bags and a monitoring system to ensure the continual compliance of the registered products with the testing guideline have also been formulated. Details are set out in Appendix I and II.

Briefing and Consultation

5. Suppliers/producers were briefed in November 2000 on the coverage of the testing parameters under the testing guideline and details of the registration scheme. Laboratories were also briefed in May and November 2000 on the procedures and methodologies of the testing guideline. No objection has been raised to the guideline and the scheme.

Way Forward

6. EPD will launch the testing guideline and the registration scheme on 29 December 2000. The guideline with the passing criteria, the details of the scheme and a list of laboratories providing the required testing service will be made available to the public through the EPD website. Relevant government departments and major catering companies will be informed of the launching of the testing guideline. It is expected that the first batch of degradable products would be registered after mid-2001. The Working Group will review the guideline and the scheme by the end of 2001.

Environment and Food Bureau
December 2000

Testing Guideline on the Degradability and Food Safety of Containers & Bags

Background

1. The increase in public environmental awareness has brought about the emergence of expanded polystyrene (EPS) alternatives in the market. Similar to EPS, these alternatives are also disposable products. It is important to note that the use of any type of disposable products should be avoided in the first place as they would generate more solid waste requiring disposal in the end.

2. The major claim of EPS alternatives is their degradability. However, there are no accepted local standards and testing methods to assess the performance of products. In end-1999, the Environmental Protection Department (EPD) formed a working group with:

- Consumer Council
- Food and Environmental Hygiene Department
- Hong Kong Association of Certification Laboratories Ltd.
- Hong Kong Expanded Polystyrene Association Ltd.
- Hong Kong Plastic Bags Manufacturers' Association.
- Hong Kong Plastics Technology Centre Ltd.
- Hong Kong University of Science & Technology

3. The objectives of the working group were to develop a testing guideline on the degradability and food safety of containers and bags; establish acceptance criteria for these products; and develop a registration scheme for those products that have passed the tests. The working group commissioned the Hong Kong Plastics Technology Centre (HKPTC) to prepare the testing guideline.

Degradable Products

4. The presently claimed "biodegradable" products are usually made of cornstarch, sugar cane, reed, grain husks and other plant fibres. These materials should in theory be biodegradable (i.e. degradation of material biologically through microbial action). However, there may be other factors affecting the biodegradability of the products made of these materials, such as the presence of non-degradable materials (e.g. polyethylene) in the products, either mixed with the raw materials or in the form of coating.

5. There are also other so-called "photodegradable" products (e.g. photodegradable bags) in which sun-sensitive components are added to the plastic material that would trigger physical disintegration of the plastic when exposed to sunlight.

Development of the Testing Guideline

6. The HKPTC developed the testing guideline by making reference to existing international standards including those from the American Society for Testing and Material (ASTM), International Standardization Organization (ISO), Japan Industrial Standards (JIS), and China National Testing Standards (GB), etc. As the testing procedures stipulated in most of these standards are developed for plastic materials, some methods may not be suitable for testing degradable products made of natural fibres under local conditions. Under the guidance of the working group, the HKPTC prepared the Testing Guideline taking into account the characteristics of the natural degradable materials and the local environmental

conditions.

7. To confirm the practicability of the testing procedures of the Testing Guideline and its suitability to local environment, the working group has commissioned the University of Hong Kong (HKU), Hong Kong University of Science & Technology (HKUST), Hong Kong Baptist University (HKBU), Hong Kong Productivity Council (HKPC) and HKPTC to conduct a series of pilot tests. The Testing Guideline has been adjusted as appropriate based on the findings of the pilot tests.

The Testing Guideline

8. The testing guideline addresses three major aspects:

- Food Safety;
- Degradability; and
- Physical Performance.

9. Food Safety

For those containers and bags which may contact with food, food safety is the prime concern. The Testing Guideline addresses this aspect by stipulating rigorous testing methods and stringent acceptance criteria to safeguard public health. The concerned food safety tests include:

- overall migration (in distilled water, acetic acid and ethanol);
- heavy metals;
- pesticide residues;
- coliform bacteria; and
- molds and yeasts.

10. Degradability

The biodegradability is determined by measuring the amount of carbon dioxide evolved from the products during degradation. During biodegradation, organic carbon - the basic ingredient of the products, would be converted into carbon dioxide and released to the environment. The measurement of carbon dioxide released would indicate the extent and pattern of biodegradation.

11. Physical Performance

The products should satisfy a number of physical criteria to assure their user-friendliness. The test results would only be used as reference as the physical performance of the products does not have any effects on food safety and degradability. The physical performance tests include:

- static loading;
- fold resistance;
- low temperature resistance;
- water and oil proof at raised temperature;
- acid resistance; and
- tensile properties (for bags).

12. Acceptance criteria for degradable products were established by the working group after taking into consideration international standards, relevant local established standards (e.g. food safety) and local environmental conditions to ensure that the criteria are comparable to those at international level. A list of passing criteria is attached.

Testing Guideline on the Degradability and Food Safety of Containers & Bags

Passing Criteria

Test item	Test method	Criterion(a)
Overall Migration	HS 1001 HS 1002	$\leq 10 \text{ mg/dm}^2$ or 60 mg/kg
Heavy Metals	HS 1003 (acid extra.)	Cd $\leq 3 \text{ ppb}$ Cr $\leq 50 \text{ ppb}$ Pb $\leq 10 \text{ ppb}$ Hg $\leq 1 \text{ ppb}$
Pesticide Residues	HS 1004	<p style="text-align: center;">Organophosphate</p> Dichlorvos $\leq 1 \text{ ppb}$ Dimethoate $\leq 1 \text{ ppb}$ Fenitrothion $\leq 1 \text{ ppb}$ Fenthion $\leq 1 \text{ ppb}$ Malathion $\leq 1 \text{ ppb}$ Parathion $\leq 1 \text{ ppb}$ Phorate $\leq 1 \text{ ppb}$ <p style="text-align: center;">Organochlorine</p> Aldrin $\leq 1 \text{ ppb}$ BHC $\leq 1 \text{ ppb}$ DDT $\leq 1 \text{ ppb}$ Dieldrin $\leq 1 \text{ ppb}$ Heptachlor $\leq 1 \text{ ppb}$
Coliform Bacteria	HS 1005	Must not be detected
Molds and Yeasts	HS 1006	$\leq 50 \text{ colonies/g}$
Biodegradability	HS 2001	$\geq 60\%$ in 180 days
Static Loading	HS 3001	Average deformation in height from three specimens $\leq 6\%$
Fold Resistance	HS 3002	No breakage occurring at the hinge for at least two out of three test specimens
Low Temperature Resistance	HS 3003	No breakage occurring for at least two out of three test specimens
Water and Oil Proof Tests at Raised Temperature	HS 3004	Not to have discoloration, defect, distortion and leakage for all three test specimens
Tensile Properties	HS 3005	As specified by supplier
Acid Resistance	HS 3006	Not to have discoloration, defect, distortion and leakage for all three test specimens

#Note:

T.B.C.= To be confirm

ND = cannot be detected

Registration Scheme for Degradable Containers and Bags

1. Purpose

1.1 This paper sets out the registration procedures for degradable containers and bags (the “products”) that meet the criteria of the “**Testing Guideline on the Degradability and Food Safety of Containers & Bags**” (the “Testing Guideline”).

2. Scope

2.1 This registration scheme applies to all containers and bags with degradable property and meeting the criteria set under the Testing Guideline.

3. Background

3.1 The increase in public environmental awareness has brought about the emergence of expanded polystyrene (EPS) alternatives in the market. The major claim of these alternative products is their degradability. However, there are no accepted local standards and testing methods to assess the performance of these EPS alternatives. In end-1999, the Environmental Protection Department (EPD) formed a working group with:

- Hong Kong Plastics Technology Centre Ltd.
- Hong Kong Association of Certification Laboratories Ltd.
- Consumer Council
- Hong Kong Expanded Polystyrene Association Ltd.
- Hong Kong Plastic Bags Manufacturers’ Association.
- Hong Kong University of Science & Technology
- Food and Environmental Hygiene Department

3.2 The objectives of the working group were to develop the Testing Guideline and establish criteria of degradable products for Hong Kong.

3.3 To let the public know which products meet the criteria of the Testing Guideline, EPD will maintain a registration scheme with product details accessible by the public via the web-sites mentioned in Section 4.3 below.

4. The Testing Guideline

4.1 The Testing Guideline was developed with due consideration given to international

standards and local environment. It lists out the details of the required tests and acceptance criteria for degradable products of various applications.

4.2 The testing guideline addresses 3 major aspects:

- I. Food Safety (for food/drink containers/bags only);
- II. Degradability; and
- III. Physical Performance.

4.3 Annex 1 lists out the tests included in the Testing Guideline. New test(s) may be added to the Testing Guideline as and when necessary. For details of individual tests, please refer to the Testing Guideline which is available in the following web-sites:

<http://www.info.gov.hk/epd>

<http://www.info.gov.hk/wrc>

5. Registration Scheme

5.1 EPD maintains a non-exhaustive register containing information on degradable products meeting the relevant criteria set under the Testing Guideline. Public may make reference to the register in selecting suitable degradable products but the register does not represent any recommendation from the Government. The register is accessible by public in the web-sites mentioned in Section 4.3 above.

5.2 The Registration Scheme is voluntary. Suppliers (the applicants) who wish to verify the degradability of their products should appoint a laboratory to conduct the tests as stipulated in the Testing Guideline (detailed in Section 8 below) for their products at their own cost.

5.3 Products meeting the acceptance criteria would be registered at no charge. The applicant should send the completed form: “Application for Degradable Product Registration” as given in Annex 2 to EPD with the required information. EPD will acknowledge the receipt of the application. After verification, the concerned product information will be put in the register with an unique registration number. An official acknowledgement letter will be issued to the applicant for the concerned products normally within 1 month.

5.4 The register provides the following information to the public:

- Degradable products meeting the criteria set under the Testing Guideline;
- Product information (e.g. raw materials, serial no.);
- Date of first registration and date of re-verification;
- Testing results; and

- Supplier/Producer information.

5.5 Any correspondence regarding the registration scheme should be addressed to:

*Waste Facilities Planning Group
2/F, East Wing
88 Victoria Road, Kennedy Town
Hong Kong
(Degradable Product Registration)*

Fax: 2872 0389

Enquiry: 2872 1711

5.6 For new products, the applicant should appoint a laboratory (detailed in Section 8 below) to conduct the required tests on food safety, degradability and physical performance.

5.7 For any one full set of testing results submitted, only the concerned product (with unique product code/no.) could be registered.

6. Group Registration

6.1 For a series of products with same physical composition (i.e. same raw material and physical configuration) but available in different forms/models (e.g. cups, bowls, plates), the applicant can apply for a group registration for the whole series of products. Under group registration, the applicant should appoint a laboratory to conduct the tests on samples of all models. The test results should indicate the coverage of the sample pool (i.e. the concerned models).

6.2 The evaluation would be conducted as follows:

- i) Food safety test (for food/drink containers/bags only)
 - ◆ For bags, a sample pool should be formed with all the concerned models. Random sampling should be adopted and only one set of test result is required for the whole series.
 - ◆ For containers, the tests should be conducted on sample having the largest extraction/testing area (usually a sample with smallest capacity). The test result will represent the whole series.
- ii) Degradability test
 - ◆ A sample pool should be formed with all the concerned models. Random sampling should be adopted and only one set of test result is required for the whole series.

- iii) Physical Performance
 - ◆ Tests should be conducted on each concerned model individually.

6.3 Under the group registration arrangement, the concerned series of products would be registered with one set of food safety (for food/drink containers/bags only) and degradability testing results. Individual physical performance testing results should be prepared for registration of the concerned products.

7. Registration of New Model of a Registered Product

7.1 For new models having the same physical composition (raw materials and physical configuration) of an already registered product/series, the evaluation of degradability of the new product could be exempted. However, food safety (for food/drink containers and bags) and physical performance tests are still required for registration purpose. The applicant should provide the required documentation to EPD following the procedures set down in Section 5 above.

7.2 If there is any change in physical composition of the new model, it should be registered as a new product and the procedures mentioned in Section 5 should be followed.

8. Laboratory Analysis

8.1 The Testing Guideline classifies degradable products into the following categories with respect to the use of the products:

- a. Degradable food/drink containers;
- b. Non-food contact degradable containers;
- c. Degradable bags which may have contact with food; and
- d. Degradable bags which will not have contact with food.

8.2 Each category of degradable products is governed by their own set of required tests (Annex 3). For details of the requirements, please refer to the Testing Guideline.

8.3 The applicant should appoint local laboratory(ies) to conduct the required tests for their products at their own cost. The local laboratories that could provide the required testing service can be found in the web-sites mentioned in Section 4.3 above. Test results issued by these laboratories are acceptable for consideration of registration. Test results issued by laboratories other than the ones listed in the web-sites would not be accepted.

9. Validity of Registration

9.1 The applicants have the responsibility to inform EPD in writing on any variation of the information of the registered products such as cessation of supply, change of production process and/or change of origin of the raw material(s). Re-registration is required if there is any change in product properties, raw materials and/or production process which may affect its performance with respect to either food safety or degradability.

9.2 The applicants are required to provide updated test reports for the registered products on food safety and degradability every 2 and 3 years after registration, respectively. For re-verification purpose, EPD has the right to request the applicants to submit the most up-to-date information on the performance of the registered products from time to time and put such information in the register. EPD will also consider revoking the concerned registration if the applicant cannot provide the required information. EPD will also conduct random checking on the performance of registered products in the market to ensure that they meet the criteria set under the Testing Guideline.

10. Claim on “Degradability” and “Microwavable”

10.1 It is common for applicants to highlight the degradability performance of their registered products for promotion purpose. To avoid giving confusing message (e.g. “degradable” without elaboration) to the customers, the recommendations of ISO 14021 should be followed. Any promotional messages relating to the degradability of the registered products (e.g. messages printed on the products) should include the following:

- the concerned testing method (e.g. HS 2001: Biodegradability Test).
- the degradability (i.e. degrade >60%); and
- the required time of degradation (i.e. in 180 days).

10.2 Confusing and vague messages like “Environmentally Friendly”, “Degradable”, “Environmentally Safe” and “Green” etc., should not be used as they will give wrong messages to the consumers. EPD may revoke the concerned registration if any non-compliance is observed.

10.3 For microwavable products, the applicants should perform relevant microwave tests according to their product specifications. Warning messages should be printed on the products or on its packaging if the product is not microwavable.

Testing Methods for Degradable Products

Test method	
Food Safety	
HS 1001	Overall Migration Test - Total Immersion Method
HS 1002	Overall Migration Test - Article Filling Method
HS 1003	Heavy Metals Test
HS 1004	Pesticide Residues Test
HS 1005	Coliform Bacteria Test
HS 1006	Molds and Yeasts Test
Degradability	
HS 2001	Biodegradability Test
Physical Performance	
HS 3001	Static Loading Test
HS 3002	Fold Resistance Test
HS 3003	Low Temperature Resistance Test
HS 3004	Water and Oil Proof Tests at Raised Temperatures
HS 3005	Tensile Properties Test
HS 3006	Acid Resistance Test

Remarks: For details and criteria of the tests, please refer to the “Testing Guideline on the Degradability and Food Safety of Degradable Containers & Bags”.

Application for Degradable Product Registration		
A. Applicant Information		
A.1: Product Supplier (the “applicant”) :		
A.2: Applicant Address :		
A.3: Contact Person (Mr./Ms) :		
A.4: Post	A.5: Tel :	A.6: Fax :
A.5: Hong Kong Business Registration No. (with copy):		
B. Product Information (For group registration, please submit individual form for each concerned product)		
B.1 Name of the Product :		
B.2 Serial no./Code :	B.3 Product Use :	
B.4 Product Size (cm) :	(W)	(D) (H)
B.5 Origin of the Product :		
B.6 Name of Producer and Address:		
B.7 Major Raw Material of the Product : (Please specify the percentage of individual raw materials and their origins)		
B.8 Information of Associated Accessories of the Product (e.g. lid and cover): (Please specify the percentage of individual raw materials and their origins)		
B.9 Information on any other registered product of the same series:		
C. Other Information (Please submit the following with the application)		
C.1 Samples of the concerned product (at least 2 samples for each model);		
C.2 Photographs of the concerned product;		
C.3 Testing report of the products issued by laboratory;		
C.4 Product information (e.g. specification). For products with composite layers (e.g. coating), the physical configuration of the product and respective raw materials must be provided;		
C.5 Other related information of the product.		

Please send the completed application form with all required documents to EPD (Please see Section 5.5 for details).

(to be attached to the application form (Annex 2))

Personal Information Collection Statement

Purpose of Collection

1. The personal data provided by means of this form will be used by Environmental Protection Department for one or more of the following purposes:
 - a. activities relating to the processing of your submission in this form;
 - b. administration and enforcement of relevant environmental legislation;
 - c. pollution complaint investigations;
 - d. statistical and any other legitimate purposes; and
 - e. to facilitate communications between Government and yourself.
2. The provision of personal data by means of this form is voluntary. If you do not provide sufficient information, we may not be able to process your application.

Classes of Transferees

3. The personal data you provided by means of this form may be disclosed to:
 - a. other government bureaus and departments, and any other organisations for the purposes mentioned in paragraph 1 above, and
 - b. other persons as permitted by the relevant legislation.

Access to Personal Data

4. You have a right of access and correction with respect to personal data as provided for in section 18 and 22 and principle 6 of Schedule 1 of the Personal Data (Privacy) Ordinance. Your right of access includes the right to obtain a copy of your personal data provided by this form.

Enquiries

5. Enquiries concerning the personal data collected by means of this form, including the making of access and corrections, should be addressed to:
Senior Environmental Protection Officer (Management Support)
28/F, Southorn Centre
130 Hennessy Road
Wanchai
Hong Kong
Tel: 2835 1330
Fax: 2834 8845

Registration Criteria for Different Categories of Biodegradable Products

	Testing Method	Container		Bag	
		Food/Drink	Non-Food/Drink	Food/Drink	Non-Food/Drink
Food Safety					
Overall Migration Test	HS 1001 / 1002	★		★	
Heavy Metal Test	HS 1003	★		★	
Pesticide Residue Test	HS 1004	★		★	
Coliform Bacteria Test	HS 1005	★		★	
Molds and Yeasts Test	HS 1006	★		★	
Degradability					
Biodegradability Test	HS 2001	★	★	★	★
Physical Performance					
Static Loading Test	HS 3001	√	√		
Fold Resistance Test	HS 3002	√	√		
Low Temp. Resistance Test	HS 3003	√	√		
Water and Oil Proof Tests at Raised Temperatures	HS 3004	√	√		
Tensile Properties Test	HS 3005			√	√
Acid Resistance Test	HS 3006	√	√		

Food/Drink - Containers/Bags for holding Food/Drink

Non-Food/Drink - Containers/Bags not for holding Food/Drink

√ Testing required and the results would be used for reference only.

★ Testing required and the results must meet the acceptance criteria.

(Criteria for registration are also subject to the specific application of the concerned products)