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	OK biodegradable MARINE : Initial acceptance tests			
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<u>Program OK 12</u> Bio products – degradation in seawater				

0. Introduction

The goal of the OK biodegradable MARINE certification scheme is not to promote the discarding of the materials or products that can biodegrade in the marine environment, but to verify the claim of biodegradability of materials or products in the marine environment.

The restriction of marine littering and the fact that some materials can biodegrade in the marine environment are not automatically in contradiction if the right application and the correct communication about the product is carefully regarded.

The certification scheme makes a clear distinction between:

1. **Certification of the claim** of marine biodegradation and
2. **Authorization to communicate** about this certification.

Whereas both aspects (1 and 2) are allowed for products where the marine biodegradability offers an added value to the environment (e.g. fishing line, fishing baits, cull panel, etc.), only the first aspect (1) is possible for products that are frequently littered: in case marine biodegradability is a functionality of a product without that this functionality is made public, it does not encourage littering but if this product inadvertently ends up in the marine environment then it is expected to become utilized by microorganisms.

1. Scope

The OK biodegradable MARINE certificate can be granted to the following materials or products:




- All raw materials
- All components and constituents also known as intermediate products
- All finished products

On the condition that they meet the requirements described in this certification scheme (biodegradable in the marine environment) and that they are non-floating material (density greater than 1.05 g/cm³).

The OK biodegradable MARINE certification only guarantees the biodegradability in seawater but does not address prevention of pollution such as the MARPOL convention for example.

2. Marking / Logo

The OK biodegradable MARINE conformity mark can be applied to a product only if this product is formally certified by TÜV AUSTRIA.

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In addition to the above specification, the use of the OK biodegradable MARINE conformity mark or logo is only allowed on finished products that:

1. Have a function in the same environment (sea water) where they are meant to biodegrade and
2. That are non-floating in their normal condition of use.

For those products that are allowed to feature the mark or logo the following determinations apply in addition:

- The use of the conformity mark (logo) is allowed on non certified packaging in case its complete content is certified. In this case it must be clearly communicated near the logo that the logo on the packaging only concerns the packed product, not the packaging.
- The use of the logo for marketing purposes is only allowed in flyers, information papers, technical sheets or equivalent documents or on websites. The use of the logo on promotional tangible goods (such as fishing line, fishing baits, cull panel, ...) is not allowed if they are not officially certified.

All the determinations as prescribed in "Annex 2.1 – Graphical chart logos" of the General Product Certification Rules must be followed.

OK biodegradable MARINE certification of a product may not be used to make a claim of compostability, (bio)degradation in the soil, (bio)degradation in fresh water or renewability. Formal certification to a separate standard such as OK compost INDUSTRIAL, OK compost HOME, OK biodegradable SOIL, OK biodegradable WATER or OK biobased is required in order to make such a claim.

Commercial or other declarations may not mislead the final consumer. More particularly the declarations concerning the use of a certified component or constituent may not give the end user the impression that the finished product is certified and complies with the OK biodegradable MARINE specifications when this is not true.

3. Normative References

The year of publication of the normative references is listed in document ref. TS-OK-18.

3.1 Applicable Standards

American Standard ASTM D 7081: "*Standard Specification for Non-Floating Biodegradable Plastics in the Marine Environment*"

Adapted for degradation in seawater (pelagic zone only)

3.2 Other references

International standard ISO 14851: "*Determination of the ultimate aerobic biodegradability of plastic material in an aqueous medium - Method by measuring the oxygen demand in a closed respirometer*"

International standard ISO 14852: "*Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium - Method by analysis of evolved carbon dioxide*"

International standard ISO 14855: "*Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions - Method by analysis of evolved carbon dioxide*"




American standard ASTM D 5338: "*Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions. Incorporating Thermophilic Temperatures*"

American Standard ASTM D 6400: "*Standard Specification for Labelling of Plastics Designed to be Aerobically Composted in Municipal or Industrial Facilities*"

American standard ASTM D 6691: "*Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in the Marine Environment by a Defined Microbial Consortium or Natural Sea Water Inoculum*"

European standard EN 13193: "*Packaging. Packaging and the environment. Terminology*"

European standard EN 13137: "*Characterisation of waste. Determination of total organic carbon (TOC) in waste, sludges and sediments*"

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European standard EN 13432 : "*Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging*"

Document with reference OPPTS 850.1010: "*Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids*"

Document with reference OECD 202: "*Daphnia sp., Acute Immobilisation Test*"

Document with reference OPPTS 850.1075: "*Fish Acute Toxicity Test, Freshwater and Marine*"

Document with reference OECD 203: "*Fish, Acute Toxicity Test*"

Document with reference OPPTS 850.5400: "*Algal Toxicity, Tiers I and II*"

Document with reference OECD 201: "*Freshwater Alga and Cyanobacteria, Growth Inhibition Test*"

Document with reference OECD 306: "*Biodegradability in Seawater*"

International standard ISO 16221: "*Water quality – Guidance for determination of biodegradability in the marine environment*"

International standard ISO 18830: "*Plastics – Test Method for Determining Aerobic Biodegradation of Plastic Materials sunk at the sea water / sandy sediment interface*"

4. Terms and definitions

Product family: Set of products whose key features are identical.

Finished product: Product resulting from the transformation and/or the assembly of raw materials and/or intermediate materials and/or semi-finished products, destined for the end user.

A component is not considered as a finished product.

In case of packaging products, the primary packaging is considered as the finished product.




Terms and definitions as described in the above listed standards.

5. Application for Certification

5.1 Documents to be supplied

Identification and characterisation of the product, notably:

- (Trade) name of the product
- Product description: product type
- Material composition (dry weight concentrations in percentages and identifications of all constituents and components - including all additives like e.g. printing inks, colorants, processing agents, fillers, ... - this identification can be in format of CAS-number, Safety Data Sheet or name of the supplier and reference code/name of the material by the supplier)
- Colour(s) of the material and if applicable the printing inks
- Maximum thickness and density, and where applicable, also grammage (measured by the relevant method)
- For finished and/or semi-finished products: dimensions
- Other relevant specifications
- Production site(s)
- In case of different internal production sites: OCO-appointment document (OCO: OK compost INDUSTRIAL officer), description of the tracking system and manufacturers agreement for each production site

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- In case of different external production sites (third companies): description of the tracking system and manufacturers agreement for each production site
- In case of sublicense certification: permission letter of the original certificate holder
- In case of the use of recycled resources: sufficient documentation about the origin, recycling and production flows of the recycled resource
- Available and relevant test reports
- A representative sample for each product (family) to be certified

5.2 Acceptance of test reports

Reports from laboratories that are officially approved by TÜV AUSTRIA are accepted.

Reports from independent laboratories that are not officially approved by TÜV AUSTRIA, but are either accredited according to ISO 17025, recognized for Good Laboratory Practices (GLP) or recognized by a similar certification body, can be accepted after a positive evaluation in detail of all requirements of the relevant test standard.

In case the test report comes from a laboratory that is not officially approved by TÜV AUSTRIA, is older than 3 years, the report can only be accepted for evaluation on the following two conditions:

- a sample from the archives of the laboratory has to be sent and FTIR analysis or other fingerprint techniques demonstrates that this sample fully corresponds to the sample submitted in the framework of the certification
- the applicant has to provide a statement that the tested sample fully corresponds to the sample submitted in the framework of the certification

6. Classification

None

7. Evaluation

7.1 Preliminary evaluation

Collection of all required information (see § 5) and preliminary inspection of the status of the material presented.

7.2 Basic Requirements

The certification scheme meets the American Standard with reference ASTM D7081, unless mentioned differently as below.

The approach for the evaluation of a finished product formed by different components is described in document ref. TS-OK-17.

The measurement of the density of the material or product is required and can be determined by using the Material Safety Data Sheet.




7.2.1 Biodegradation

Chemically unmodified materials of natural origin shall not automatically be accepted as being biodegradable without testing.

For test materials/products, the percentage of biodegradation shall be at least 90% in total or 90% of the maximum degradation of a suitable reference substance after a plateau has been reached for both test material/product and reference substance after 6 months of testing.

7.2.2 Disintegration

The disintegration test must specify the maximum thickness and density for which the material has been tested and approved. This thickness shall be the maximum thickness for which disintegration is guaranteed. For higher thickness, supplementary tests or/and examinations have to be carried out.

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The disintegration test is described in document ref. TS-OK-23.

A multilayer consisting of 2 already OK biodegradable MARINE certified layers (without glue in between) will be regarded as fulfilling the disintegration requirements of the OK biodegradable MARINE mark on the condition that the thickness of each of these layers does not exceed half of the respective certified thickness.

Adjacent layers (without glue in between) of a multilayer that are composed of exactly the same material are regarded as one layer.

The complete approach for the disintegration testing of multilayers is described in document ref. TS-OK-15.

In case a blend is made of already certified materials, the disintegration requirements are not automatically considered as fulfilled. An additional disintegration test can be necessary, depending on the applied thickness and concentrations.

The approach for the evaluation of replacing a layer in a multisheet packaging is described in document ref. TS-OK-16.




The addition of a masterbatch up to 5 % (dry weight of the end product), which only function is to colour the material or product and which carrier is chemically similar to the product material, does not require additional disintegration testing.

In order to obtain a certificate of conformity for a specific constituent (e.g. additive, glue, colorant, ink, masterbatch, ...) a disintegration test is not mandatory because the disintegration behaviour of this constituent will be evaluated when applied in the finished product.

7.2.3 Environmental safety (toxicity)

The concentration of material to be tested must be of 1% on dry mass basis. Correspondingly the concentration in which a separate constituent must be tested must be of 1% multiplied by the concentration in which that constituent is added to the final product (concentrations on dry mass basis). An incubation period of 3 months of the test material prior to the test is required.

For the relevant concentration, less than 90% of the tested organisms should be affected.

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An assessment of the negative effects (toxicity) of constituents accounting for less than 0.1% of the dry weight of a material or product does not have to be checked provided the total percentage of these constituents does not exceed 0.5% of the dry weight of this material or product.

All food additive approved ingredients are regarded as fulfilling the toxicity requirements.

Constituents that appear on the (candidate) list of Substances of Very High Concern (Annex XIV or the REACH) are not accepted.

This must be verified for all constituents that are not tested for toxicity and are not food additive approved ingredients.

7.2.4 Chemical characteristics

Requirements regarding the heavy metals and other toxic and hazardous substances according to table A.1 of annex A of the EN 13432 must be met. In addition, the requirements for Cobalt according to table II of the Trade Memorandum T-4-93 must also be met (i.e. maximum 38 ppm).

Important remark: As heavy metals are submitted to local regulations, it is necessary to verify that the level of heavy metals of this certified product does not exceed the concentrations admitted in the region where it is sold.

In case recycled resources are used, the most critical chemical elements will be selected during the initial certification. These critical elements function as indicators and must be measured once a year after initial certification. On the condition that during the two years after initial certification, the indicators have not revealed any risk of exceeding the required limitations of heavy metals and fluorine and on the condition that sufficient documentation can be submitted in order to prove that the recycling process is well known and controlled, the follow up of the indicators can be omitted.

All food additive approved ingredients are regarded as fulfilling the chemical characteristics requirements.

7.2.5 Additional determinations

If the components used are different from those used for the certified basic material, an extension of the certified basic material is not possible without additional tests or/and examinations.

Any change to a certified material or product has to be notified to the TÜV AUSTRIA services.

In well-founded exceptional cases, the Certification Committee can decide to require additional testing.

¹ Editorial change – 6th March 2015