OK compost INDUSTRIAL

Certification Scheme OK 01

Rev F – 01.01.2022

PD-BA-TABE-CERT-BIO-CS-001_OKI_EN

1. Introduction

This certification scheme only considers industrial compostability. The scheme cannot be used to evaluate other end-of-life treatments (home compostability, biodegradation in soil or water, suitability for recycling, ...) or other environmental aspects (renewable resources, energy use, water use, …).

Based on the EN 13432:2000 standard for which it extends the scope, this certification scheme provides proof of compliance with the essential requirements of the European Directive 94/62/EC and its amendments. This certification scheme covers the assessment of four parameters described below: biodegradability and disintegration under industrial composting conditions, ecotoxicity and material characteristics.

Biodegradation is the assessment of the chemical transformation of organic matter into mineral matter by micro-organisms. Disintegration is the assessment of physical fragmentation. Ecotoxicity aims to assess the absence of negative effects on plant development of mature compost. Finally, the assessment of material characteristics consists of an elementary evaluation of heavy metals and other hazardous substances as well as assessing the volatile solids content.

2. Scope

The certified items are identified in 3 main groups

1. raw materials
2. intermediates
3. finished products

These 3 groups are themselves divided into families and types.
Example : 3. Finished products — 3.2. Catering — 3.2.1. Trays and plates

A list of these categories is available on our website: www.okcompost.org.

For all industrially compostable raw materials, intermediates and finished products showing conformity to the certification scheme an OK compost INDUSTRIAL certificate can be issued.

The Certification Committee reviews applications to ensure that a product can be certified.

In some cases, a product :

- Cannot be certified to avoid any risk of misinterpretation by end users
- May be certified
  - but the logo may not be affixed to the product;
  - by imposing additional communication to clarify the meaning of the logo;
  - by imposing additional requirements relevant to the application in question.

3. Normative references

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

3.1. Applicable standards

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

3.2. Optional standards

- EN 14995: "Plastics — Evaluation of compostability — Test scheme and specifications"
- ISO 18606: “Packaging and the environment – Organic Recycling”
- ISO 17088: “Plastics — Organic recycling — Specification for compostable plastics”
- ASTM D6400: “Standard Specification for labelling of plastics designed to be aerobically composted in municipal or industrial facilities”
- ASTM D6868: “Standard specification for labelling of end items that incorporate plastics and polymers as coating or additives with paper and other substrates designed to be aerobically composted in municipal or industrial facilities”
- AS 4736: ”Biodegradable plastics suitable for composting and other microbial treatment”

4. Terms and definitions

Terms and definitions as described in the above listed standard(s).

4.1. Quantitative disintegration test:

Disintegration test with a precise mass balance and sieving in accordance with a standard such as ISO 16929 or EN 14045

4.2. Qualitative disintegration test:

Disintegration test based on Standard ISO 20200 or ISO 16929, while clearly specifying the temperature at which the test has been conducted and without a precise balance of mass.
For the majority of qualitative disintegration tests the test material is put in slide frames which are subsequently added to the compost.

4.3. Product family:

Set of products whose key features are identical.

4.4. Component:

Part (of a finished product) that can be separated by hand or by using simple physical means (according to EN 13432 extended in the frame of this scheme). The methodology used to determine if a part can be considered as a component or not is described in document ref. TS-OK-17.

4.5. Constituent:

All pure chemical materials and substances of which a material is composed (according to EN 13432 extended in the frame of this scheme)

5. Marking & logos

The OK compost INDUSTRIAL logo can be applied to a product only if this product is formally certified by TÜV AUSTRIA.

The guidelines for the correct use of the OK compost INDUSTRIAL logo as prescribed in "Annex 2.1 – Graphical chart logos" of the General Product Certification Rules[1] must be followed.

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

Commercial or other declarations may not mislead the final consumer. In particular, 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 compost INDUSTRIAL specifications when this is not true.

The use of the logo is allowed on non-certified packaging in case its content is certified. On the packaging near the logo it must be clearly communicated that the packaged product is certified and not its 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 bags, ball points, boxes, …) is not allowed if they are not officially certified.

6. Application for certification

6.1. Documents to be supplied

Identification and characterization 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 printing inks
- Maximum thickness, and where applicable, also grammage or density (measured by the relevant method) or mass and surface / volume (3D objects)
- For finished and/or semi-finished products: dimensions, photos and technical drawings.
- For 3D objects: print screens of the program assessing the volume and total external surface of the objects. the volume is the volume of material subject to certification. the total surface area corresponds to the entire visible surface (including outside parts, inside parts, rim, etc.). The density also has to be specified.
- Other relevant specifications

[1] PD-BA-TABE-CERT-BIO-004_Certification_Rules

- Production site(s)
- In case of different internal production sites: OCO-appointment document (OCO: OK compost officer), description of the tracking system and manufacturers agreement for each production site
- In case of different external production sites (sub-contractors or third party): 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

6.2. Acceptance of test reports

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

Reports from independent laboratories that are not officially registered by TÜV AUSTRIA, but are accredited according to ISO 17025, can be accepted after a positive evaluation showing that all requirements of the relevant test standard are fulfilled.

In case the test report comes from a laboratory that is not officially approved by TÜV AUSTRIA or 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 assessment
- the applicant has to provide a statement that the tested sample fully corresponds to the sample submitted in the framework of the assessment

The laboratory must send TÜV AUSTRIA a specimen of the lot, supplied by the applicant, from which the samples have been extracted for testing. On specific request of TÜV AUSTRIA.

7. Classification

None

8. Evaluation

8.1. Preliminary evaluation (pre-analysis)

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

During this stage, the documents submitted by the applicant are evaluated in detail. If necessary, additional tests may be required. A pre-analysis report is prepared for the client in order to specify the required testing if needed.

Requirements

The certification scheme meets the European standard with reference EN 13432.

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

8.1.1. Biodegradation

To be designated as organically recoverable, each packaging, packaging material or packaging component has to be inherently and ultimately biodegradable as demonstrated in laboratory tests and has to show conformity to the criteria and pass levels given hereafter.

The biodegradation test procedures described in Standard ISO 14855-1, ISO 14855-2, ISO 14851, ISO 14852, or EN 14046 are regarded as sufficient evidence for the fulfilment of the biodegradation requirements.

The period of application for the test specified in the test methods shall be a maximum of 6 months.

For the test material 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, the test and the reference material.

Chemically unmodified packaging materials and constituents of natural origin, such as wood, wood fiber, cotton fiber, unmodified starch, paper pulp or jute shall be accepted as being biodegradable without testing but shall be chemically characterized (see 8.1.4.) and fulfil the criteria for disintegration (see clause 8.1.2.) and compost quality (see clause 8.1.3).

Blending two biodegradable components is regarded as fulfilling the biodegradation requirements.

Given that biodegradability shall be determined for each packaging material or each significant organic constituent of the packaging material, significant shall mean any organic constituent present in more than 1 % of dry weight of that material.
The total proportion of organic constituents without determined biodegradability shall not exceed 5 %.

All constituents and their maximum concentrations as specified on the positive list (technical sheet ref. TS-OK-10) are regarded as fulfilling the biodegradation requirements.

8.1.2. Disintegration

General approach

When a disintegration test is carried out, the maximum thickness (or grammage) tested and approved must be clearly indicated. This thickness is the maximum thickness (or grammage) for which the disintegration of a material is guaranteed under the conditions of an industrial compost.

For non-woven, fiber and cellulose based materials the grammage has to be mentioned on the test report .

For higher thicknesses or grammages, supplementary tests or/and examinations have to be carried out.

For 3D objects, the disintegration assessment may be based on the volume and surface as described in §6.1 This mass to surface ratio is the maximum mass to surface ratio for which the disintegration of a material is guaranteed.

The result of the qualitative disintegration test (definition: see § 4) with slides is considered positive if:

(1) at the end of the test at least 81 % of the test material surface within the slide has disappeared (remaining surface must be quantified by appropriate means), corresponding to an average of 90 % of the length and 90 % of the width (this must be demonstrated for each tested slide, the number of these slides being at least 10)

(2) no remaining of the test material are distinguished in the compost after testing (this means that there can be no visual pollution)

If the qualitative disintegration is not performed in slides, but on the complete material (e.g. on sugarcane plates), the result is considered positive if the material cannot be distinguished from the compost at the end of the test.

The disintegration test procedure described in Standard ISO 16929 or EN 14045 (quantitative sieving testing) is regarded as sufficient evidence for the fulfilment of the disintegration requirements.

The period of application for the test specified in the test methods shall be a maximum of 12 weeks.

The disintegration test procedure described in Standard ISO 20200 (quantitative sieving test) is regarded as sufficient evidence for the fulfilment of the disintegration requirements. The compost issued from test procedure ISO 20200 is however not suitable to prepare the ecotoxicity tests.

Remark: the procedure described in Standard ISO 20200 includes a risk of a false negative result.

The particles or pieces from the test sample which do not differ from the compost in colour, structure, dimension, moisture feeling, brightness/gloss are considered to be compost and are not taken into account while determining the percentage of test material that failed to pass through the > 2 mm fraction sieve.

Exceptions and extension to the general approach

The addition of a microscopic dispersed metalized layer (limited to a thickness of 1 µm and not containing any binders or polymers) requires additional disintegration testing to evaluate the visual contamination.

No additional disintegration testing is required for a hollow body if its wall thickness does not exceed half of the certified thickness of its material. A product is considered as a hollow body if its ratio length/area is higher than 1 cm^{-1}, where length is its longest dimension (usually height) and area is the surface of the opening(s).

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

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 the document with ref. TS-OK-15.

In case a blend is made of already certified materials and/or fillers (talc or $CaCO_3$), the disintegration requirements are not automatically considered as fulfilled. An additional disintegration test can be required, depending on the applied thickness and concentrations. The approach for the evaluation of blend of two certified materials and inorganic fillers is described in document ref. TS-OK-24.

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), whose only function is to colour the material or product and whose 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, …) the need for disintegration tests is determined on a case-by-case basis and disintegration tests on the finished product may also be required.

8.1.3. Compost quality (ecotoxicity)

The concentration of test material to be added to the compost must be 10 % on wet mass basis (of which 9 % as powder or granulates) according to Standard ISO 16929 (§ 6.1.1.4) or Standard EN 14045 (§ 6.1.1.4). Correspondingly the concentration in which a separate constituent must be tested in the compost is always at least one tenth of the concentration in which that constituent is added to the final product (concentrations on wet mass basis).

Any constituent present in less than 0.1 % of dry weight in a material does not need to be tested for ecotoxicity. The total proportion of constituents not tested for ecotoxicity shall not exceed 0.5 %. All constituents and their maximum concentrations as specified on the positive list (technical sheet ref. TS-OK-10) are regarded as fulfilling the compost quality requirements. If any of these materials has been bleached then the compost quality criterium is not fulfilled.

All food additive (with E number) approved ingredients are regarded as fulfilling the compost quality requirements.

Constituents that appear on the (candidate) list of Substances of Very High Concern (Annex XIV of the REACH Regulation) are not accepted. This must be verified for all constituents.

8.1.4. Chemical characteristics

In case recycled resources are used, the most critical chemical elements will be identified and documented during the initial certification. These critical elements can be considered 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 concentration limitations for 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 (with E number) approved ingredients are regarded as fulfilling the chemical characteristics requirements.

As specified in EN 13432 the total Fluorine concentration of the product must not exceed 100ppm. To further restrict the use of per-fluorinated or fluorinated chemicals each applicant must sign a self-declaration that no PFAS (as defined by the OECD, see §12.4.) are added to their product.

Naturally occurring fluor present in inorganic filler such as talc can cause the concentration of fluor to go above 100ppm. If this fluor is contained in the inorganic filler it is non-toxic as it is not bioavailable. This fluor can be accepted on the condition that it can be demonstrated that the source of the fluor is the inorganic filler and not a fluorinated chemical.

The samples tested for fluor have to be prepared by destructive digestion, not extraction.

8.1.5. Variation of composition

The conformity mark, granted to a basic material, is valid for a variant of this same material on the condition that the variant contains the same and no more constituents as the certified basic material. The percentage of each constituent must not deviate more than 20 % from the initially certified percentage of the constituent. The application of this rule has to be notified to and approved by TÜV AUSTRIA.

Example: The certification of a basic material with certified percentages of constituents 70% – 20% – 9% – 1% is also valid for a variant of the same basic material with percentages of constituents (70±14)% – (20±4%) – (9±1.8)% – (1±0.2)% on the condition that the material is still made from the same constituents as the initially certified basic material.

8.2. Possible extension of the certification

If the components and/or constituents 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 evaluation.

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

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

9. Link to other schemes

Foreword

The biodegradability properties vary according to the environment. A product that is biodegradable in one environment is not necessarily biodegradable in another environment. However, some information may lead to the conclusion that a product biodegradable under certain conditions may also be biodegradable under other conditions.

9.1. OK compost HOME to OK compost INDUSTRIAL

9.1.1. Biodegradation

A product considered as biodegradable according to OK compost HOME certification scheme [biodegradable at ambient temperature] can be considered as biodegradable according to the OK compost INDUSTRIAL certification scheme [biodegradable at high temperature] on the following conditions

1. Without any high-temperature testing, if the delay to reach 90% is less than that required at high temperature (6 months), according to the principle of most can do least.
2. If the delay at low temperature exceeds the 6 months prescribed at high temperature, the carry-over can be accepted
    a. without biodegradation tests, as conditions at high temperatures are infinitely more favourable than at room temperature but;
    b. needs to be confirmed by a high temperature disintegration (quantitative or qualitative) test, demonstrating that the process is going well at high temperatures.

9.1.2. Disintegration

A disintegration test always needs to be carried out for each temperature low and high and at least one of the two must be a quantitative one:

- qualitative at low temperature implies a quantitative at high temperature

or

- quantitative at low temperature implies a qualitative test at high temperature if the disintegration delay at low temperature exceeds the 12 weeks prescribed at high temperature

9.2. OK biodegradable SOIL to OK compost INDUSTRIAL

9.2.1. Biodegradation

A product considered as biodegradable according to the OK biodegradable SOIL certification scheme [biodegradable in soil conditions] can be considered as biodegradable according to OK compost INDUSTRIAL certification scheme [biodegradable at high temperature] on the following conditions:

1. Without any high-temperature testing, if the delay to reach 90% is less than that required at high temperature (6 months), according to the principle of most can do least.
2. If the delay at low temperature exceeds the 6 months prescribed at high temperature, the carry-over can be accepted
    a. without biodegradation tests, as conditions at high temperatures are infinitely more favourable than in soil conditions but;
    b. needs to be confirmed by a high temperature disintegration (quantitative or qualitative) test, demonstrating that the process is going well at high temperatures.

9.2.2. Disintegration

Since there are no disintegration requirements for OK biodegradable SOIL, a quantitative disintegration test is always required.

9.2.3. Ecotoxicity

If the ecotoxicity has been done purely according to the OK biodegradable SOIL certification it has to be repeated according to the OK compost INDUSTRIAL certification scheme. If the ecotoxicity test has been done according to the OK compost INDUSTRIAL certification scheme and used for the OK biodegradable SOIL certification scheme it can be accepted for the OK compost INDUSTRIAL certification.

9.3. OK biodegradable WATER to OK compost INDUSTRIAL

9.3.1. Biodegradation

According to the principle of most can do least, biodegradation at low temperature in water can be used as evidence of biodegradation in industrial composting conditions.
This is only true if the biodegradation tests have been performed according to ISO 14851 or ISO 14852.

9.3.2. Disintegration

Since there are no disintegration requirements for OK biodegradable WATER, a quantitative disintegration test is always required.

10. Validity of the certificate

Unless otherwise specified, a certificate is valid for 5 years.

11. Revision history

The following list provides a key-word-based overview of the changes made to this QM document over time.

Revision	Date	Change
E	01-03-2012	
E	2018	Cosmetic change (transfer for Vinçotte to TÜV Austria)
E	01.02.2019	Corrigendum February 2019
F	01.01.2022	Various technical clarifications and update of layout

12. Informative references – Bibliography

12.1. European Standards

- EN 13137: "Characterisation of waste. Determination of total organic carbon (TOC) in waste, sludges and sediments"
- EN 13193: "Packaging - Packaging and the environment. Terminology"
- EN 14045: "Packaging - Evaluation of the disintegration of packaging materials in practical oriented tests under defined composting conditions"
- EN 14046: "Packaging - Evaluation of the ultimate aerobic biodegradability of plastic material under controlled composting conditions - Method by analysis of evolved carbon dioxide"
- EN 29408: "Water quality. Evaluation in an aqueous medium of the "ultimate" aerobic biodegradability of organic compounds: method by determining the oxygen demand in a closed respirometer"
- EN 29439: "Water quality. Evaluation in an aqueous medium of the "ultimate" aerobic biodegradability of organic compounds: method by analysis of released carbon dioxide"

12.2. International standards

- ISO 9408: "Water quality - Evaluation in aqueous medium of the "ultimate" aerobic biodegradability of organic compounds - Method by determining of the oxygen demand in a closed respirometer"
- ISO 9439: "Water quality - Evaluation in aqueous medium of the "ultimate" aerobic biodegradability of organic compounds - Method by analysis of released carbon dioxide"
- ISO 11266: "Soil quality - Guidance on laboratory testing for biodegradation of organic chemicals in soil under aerobic conditions"
- 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"
- ISO 14852: "Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium - Method by analysis of evolved carbon dioxide"
- ISO 14855-1: "Determination of the ultimate aerobic biodegradability and disintegration of plastic material under controlled composting conditions - Method by analysis of evolved carbon dioxide"
- ISO 14855-2 " Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions — Method by analysis of evolved carbon dioxide — Part 2: Gravimetric measurement of carbon dioxide evolved in a laboratory-scale test"
- ISO 16929: "Determination of the degree of disintegration of plastic materials under defined composting conditions in a pilot-scale test"
- ISO 17556: "Determination of the ultimate aerobic biodegradability in soil by measuring the oxygen demand"
- ISO 20200: "Plastics - Determination of the degree of disintegration of plastic materials under simulated composting conditions in a laboratory-scale test"

12.3. American Standards

- ASTM D5271: "Test Method for Assessing the Aerobic Biodegradation of Plastic Materials in an Activated Sludge Wastewater-Treatment System"
- ASTM D5338: "Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions. Incorporating Thermophilic Temperatures"
- ASTM D5988: "Standard Test Method for Determining Aerobic Biodegradation in Soil of Plastic Materials or Residual Plastic Materials After Composting"
- ASTM D6691: "Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in the Marine Environment by a Defined Microbial Consortium or Natural Sea Water Inoculum"

12.4. OECD

- OECD 208: "Terrestrial Plant Test: Seedling Emergence and Seedling Growth Test"
- OECD 301 C: "Aquatic respirometric biodegradation test (MITI)"
- OECD 301 B: "CO2 Evolution (Modified Sturm Test)"
- OECD Environment, Health and Safety Publications Series on Risk Management No. 61: “Reconciling Terminology of the Universe of Per- and Polyfluoroalkyl Substances: Recommendations and Practical Guidance”

12.5. TÜV AUSTRIA documents

These documents are available on request.

- PD-BA-TABE-CERT-BIO-004_Certification_Rules “General Product Certification Rules”
- TS-OK-10: “OK compost INDUSTRIAL, OK compost HOME, OK biodegradable SOIL and OK biodegradable WATER - Positive List of Additives”
- TS-OK-15: “OK compost INDUSTRIAL and OK compost HOME - Technical Specification for Disintegration Testing of Multilayers” TS-OK-16: “OK compost INDUSTRIAL and OK compost HOME - Disintegration Testing of Multi-Sheet Packaging”
- TS-OK-16: “OK compost INDUSTRIAL and OK compost HOME - Disintegration Testing of Multi-Sheet Packaging”
- TS-OK-17: “Finished products: Technical Specification for the evaluation of the whole product versus its separate components”
- TS-OK-18: “OK compost INDUSTRIAL, OK compost HOME, OK biodegradable SOIL, OK biodegradable WATER, OK biodegradable MARINE - Year of Publication of the Normative References “
- TS-OK-24: ”OK compost INDUSTRIAL and OK compost HOME: Test Scheme for Disintegration testing of blend of materials”