

1. Introduction

The first ever standard about compostability was the European one **EN 13432** – “Requirements for **packaging** recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging”.

Published in 2000 and describing the essential criteria of the *Packaging & Packaging Waste Directive (94/62/EC)*, this harmonised standard is the father of all other standards in that field.

2. Similar standards

All other standards share the same common core but have some differences at the level of the scope and/or the requirements.

Europe:

EN 13432 - Requirements for **packaging** recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging.

EN 14995 - Plastics - Evaluation of compostability - Test scheme and Specifications

International standards:

ISO 18606 - Packaging and the environment – Organic Recycling

ISO 17088 - Specification for compostable **plastics**

United States of America:

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

Australia: **AS 4736** - Biodegradable **plastics** suitable for composting and other microbial treatment

Canada (Quebec): **CAN/BNQ 0017-088** - Specification for compostable **plastics**.

As described in the title of these standards, they are applicable to **packaging** (made of plastic or not) or to **plastic products**.

All of them share the main test & criteria:

- 90 % biodegradation after 6 months $58 \pm 2^\circ\text{C}$
- 90 % disintegration after 3 months at high temperature (range between 40 & 70°C as detailed in the standards)
- Ecotoxicity and regulated elements content (heavy metal)

Nevertheless, some tests or requirements have been modified or added, and we find it important to summarise the main differences in this document (for details, please refer to the standards).

3. OK compost INDUSTRIAL & the SEEDLING logo

Both OK compost INDUSTRIAL and the SEEDLING logo are based on the EN 13432, and both extend the scope of the standard to all types of products ¹.

Nevertheless, some minor differences remain (see our document 432 – “*EN 13432 – Seedling® & OK compost INDUSTRIAL®*”).

Owner of the OK compost INDUSTRIAL® scheme and member of the Advisory Committee of the SEEDLING® logo scheme, TÜV AUSTRIA works on the harmonisation of both schemes.

4. OK compost INDUSTRIAL: update or not?

TÜV AUSTRIA shall not include the requirements of these international standards in the OK compost INDUSTRIAL® scheme but, as for other certification schemes, we offer the possibility to our customers to “personalize” their certificates by adding optional standards in the criteria.

For example, if a product fulfils the requirements of OK compost INDUSTRIAL® only, the criterion on the certificate is:

Criteria: • Test Program with reference OK 1 edition E “compostability of products” Including EN 13432

If a product fulfils the criteria of both OK compost INDUSTRIAL® and ASTM standard, the criteria will be described as:

Criteria: • Test Program with reference OK 1 edition E “compostability of products” Including EN 13432
• ASTM D6400-19

giving the owner of the certificate the possibility to use it as evidence of compliance to the American standard.

5. Differences between standards

| | OK compost INDUSTRIAL® & Seedling® logo ² | EN 13432:2000 EN 14995:2006 | ISO 17088:2012 ISO 18606:2013 | AS 4736:2006 | ASTM D6400-12 ASTM D6868-17 |
|--|--|--|---|---|--|
| CHARACTERISATION | | | | | |
| • Heavy metals / regulated elements | Same as EN 13432 | As, Cd, Cr, Cu, F, Hg, Mi, Ni, Pb, Se & Zn | Global table with local/regional values | as EN 13432 + cobalt | Reduced list, with higher admissible values ³ |
| • Inorganic materials | Product shall contain a minimum of 50% of volatile solids | | | | - |
| BIODEGRADATION | | | | | |
| • Applicable standards for biodegradation ⁴ | ISO 14855-1, -2 EN 14046 | ISO 14855 | ISO 14855-1, -2 | ISO 14855 | ISO 14855-1, -2 or ASTM D5338 |
| • Temperature & delays | 58 ± 2 °C, 6 months | | | | |
| • Conversion to CO ₂ | ≥ 90% absolute or relative | | | | |
| • Biodegradation for constituents | No requirements on constituents present at levels between 1 to 10 % | | Constituents present at levels between 1 to 10 % shall be tested individually | | |
| • Non-significant parts | No biodegradation test for non-significant (< 1%) constituents, up to 5% | | | | |
| • Exemption for material of natural origin | yes | EN 13432 : yes EN 14995 : N/A | ISO 18606 : yes ISO 17088 : N/A | no | ASTM D6400 : N/A ASTM D6868 : yes ⁵ |
| DISINTEGRATION | | | | | |
| • Applicable standards for disintegration | ISO 16929 ISO 20200 ⁶ EN 14045 | • Not referred in EN 13432 ⁷ • ISO 16929 | ISO 16929 ISO 20200 | ISO 16929 | ISO 16929 ISO 20200 |
| • Temperature & delay | Variable range of thermophilic temperatures for max 12 weeks | | | | |
| • Criteria | <10 % (dry weight) of test material shall fail to pass through a > 2 mm fraction sieve | | | | |
| • Visual contamination | No visual contamination allowed | | | | |
| • Exemption for equivalent form | yes | yes | ISO 17088 : no ISO 18606 : yes | yes | no |
| ECOTOXICITY | | | | | |
| • Applicable standard | OECD 208 modified according to EN 13432 annex E | | | | |
| • Criteria | Germination rate and plant biomass > 90% on minimum 100 seeds | | | | |
| • Plant biomass | 2 plant species from 2 of the 3 categories of OECD 208 + summer barley as 4th category | | ISO 18606 : 4 plants (2 from each family) | 2 plant species from 2 of the 3 categories of OECD 208 + summer barley as 4th category. | |
| • Worm test ? | no | | | yes according to ASTM E1676 | no |

¹ Except when the industrial compostability of such a product is senseless.

² There are some minor differences between both schemes (interpretations).
e.g.: biodegradation test according to OECD 301/310 is accepted.

³ Differences between US and Canada. Canada requires Co measurement, not included in EN 13432.

⁴ Standards ISO 14851-1 and ISO 14852 are accepted as alternative methods.

⁵ A material is considered as natural if its biobased carbon content > 95%.

⁶ ISO 20200 is not suitable for ecotoxicity test.

⁷ The disintegration standards have been published after the publication of the EN 13432 standard.

However, all testing houses and certification bodies refer to these more recent standards for disintegration.