

Guidance for the assessment of input materials to certified operations

Who is the guidance for:

Inspectors and certification officers who inspect and audit processes for compliance with PAS 100 and Compost Quality Protocol requirements, under AfOR Compost Certification Scheme

1. Introduction

PAS 100:2011 sets more stringent physical contaminant limits than the 2005 edition of PAS 100, the total physical contaminants > 2mm limit reducing from 0.5 % m/m to 0.25 % m/m, of which the plastic contaminants > 2 mm limit reducing from 0.25 % m/m to 0.12 % m/m, and the stones > 4 mm limit in mulch grade reducing from 16 % m/m to 10 % m/m. The 2011 edition of PAS 100 also provides clearer requirements with regard to sharps and the composter's responsibility to check customers' requirements and make his/her Quality Policy clear in terms of the sharps quality requirement for each PAS 100 compost grade.

Input materials collected through some local authority biowaste collection schemes contain unacceptable levels of physical contaminants, which can be particularly challenging when householders are allowed to include paper and cardboard in the organics collection bins and this has not been restricted to plain¹ types of paper and cardboard and/or those that are certified 'compostable' / 'home compostable'.

This AfOR guidance aims to make clear to the certification body inspectors and certification officers what types of material are physical contaminants, aspects of the composter's Quality Management System and compost quality that should be carefully checked, and steps that the composter could be expected to take with input material suppliers to reduce the amount of physical contaminants when they exceed agreed amounts set in the composter's appropriate Quality Management System document(s), including supply contracts where appropriate.

2. Physical contaminant types

Physical contaminant types that may be present in input materials include:

- ✓ glass²,

¹ 'Plain' means any fragment of paper or cardboard that that looks as though it has been bleached white or has a natural brown/faun/beige colour, and does not appear shiny, glossy, laminated, metalised, foil-coated, printed with ink(s), and/or has been coloured with a man-made pigment or dye.

² Some of the fragments can be 'sharp', defined in PAS 100 as 'man-made contaminants that are greater than 2 mm in any dimension that can cause physical injury to a person or animal who comes into contact with these materials, including a person who handles composted materials without protective gloves'.

- ✓ metal²,
- ✓ plastics² that are not certified 'compostable' and/or 'home compostable' in compliance with of the relevant standards specified in this guidance document³,
- ✓ any kind of packaging that is bright, glossy, shiny, pigment coloured, and/or printed with ink but is NOT certified 'compostable' and/or 'home compostable' in compliance with one of the relevant standards specified in this letter (many cartons and cardboard food packaging items are unsuitable),
- ✓ stones,
- ✓ pieces of brick, concrete, ceramic and tile².

Annex 1 to this guidance document shows the information (product certification codes, claims and logos) that should be displayed on packaging, bags and other items independently certified 'compostable'.

3. The two main physical contaminant problems

3.1 Paper and cardboard

Some Local Authorities are collecting paper and cardboard with the biodegradable wastes. The main problems with paper and cardboard are that:

1. Paper and cardboard wastes comingled with biodegradable wastes are very likely to include physical contaminants such as plastic films, staples, adhesives, and other undesirable contaminants that may compromise the quality of the finished compost; and
2. Paper and cardboard wastes comingled with biodegradable wastes are often not only the plain or 'compostable' types (because the Local Authority has not targeted those or communicated clearly to householders) so are likely to include items unsuitable for composting, such as:
 - a. plastic-coated paper / cardboard,
 - b. milk / juice cartons,
 - c. cereal boxes,
 - d. washing powder boxes,
 - e. hot and cold paper drinking cups,
 - f. frozen food containers,
 - g. plastic-lined paper bags,
 - h. take-out containers,
 - i. plastic-coated paper plates,
 - j. glossy magazines and catalogues,
 - k. foil-coated paper and cardboard,
 - l. other shiny / glossy paper and cardboard, and
 - m. paper / cardboard printed with inks or coloured with dyes⁴

³ 'Compostable' means independently certified compostable to the "compostable" criteria within BS EN 13432, BS EN 14995, DIN V 54900, ASTM D6400, or AIB-Vinçotte International S.A.'s 'Program OK 2' criteria for "home compostable" packaging, plastics or equivalent

- n. biowaste bags that are not made from compostable material.

The majority of the materials in the list above do not degrade within typical composting process timescales (e.g. plastic-coated cartons) or are likely to contain potentially toxic substances (some kinds of dyes and inks) that should be assessed for 'compostability' / 'home compostability' against criteria in a relevant standard. You can find more information on the issues generated by including paper and cardboard in biodegradable waste collections [HERE](#).

Paper and cardboard types suitable for composting are:

- a. paper tissues, paper napkins and paper towels,
- b. toilet roll and kitchen roll cardboard tubes,
- c. egg boxes with labels removed,
- d. brown/plain corrugated cardboard,
- e. office white paper (shredded or unshredded, unprinted)
- f. newspapers,
- g. 'Compostable'⁵ bags / liners
- h. 'Compostable'⁵ packaging (e.g. cartons, trays)

These material types are compostable, but the compost producer should take care to keep the proportion in any one composting batch low and may have to use extra processing measures (e.g. extra wetting and composting duration) to ensure that the compost complies with PAS 100 quality requirements and the customer receives compost that he/she regards as 'fit for purpose'.

3.2 Plastics

Even if the Local Authority does not allow plain paper and cardboard in the biodegradable waste collection, physical contamination can still occur due to:

- a. the presence of collection bags and liners that are not independently certified 'compostable' / 'home compostable' to one of the standards or to the 'home compostable' criteria referred to in clause 6.14 of PAS 100:2011,
- b. the presence of carrier bags that are not certified 'compostable' to one of the standards or to the 'home compostable' criteria referred to in clause 6.14 of PAS 100:2011,
- c. the presence of plastic coated food packaging, cartons and other items that are not certified 'compostable' and/or 'home compostable' in compliance with one of the standards referred to in clause 6.14 of PAS 100:2011, and

⁴ AfOR regards newspaper (a type of non-plain paper) as suitable for composting because the UK's newspaper industry widely uses inks that are soya based or that contain low concentrations of potentially toxic elements.

⁵ 'Compostable' means independently certified compostable to the "compostable" criteria within BS EN 13432, BS EN 14995, DIN V 54900, ASTM D6400, or AIB-Vinçotte International S.A.'s 'Program OK 2' criteria for "home compostable" packaging, plastics or equivalent.

- d. the presence of other physical contaminants such as glass, sharps and metal, and
- e. the presence of garden or food waste bags which are not compostable.

You can find more information on the independent certification of 'compostable' and 'home compostable' packaging and plastics and how to check the validity of the associated claims [HERE](#).

You can also find AfOR's call to action for Local Authorities to improve the quality of biowaste collected [HERE](#).

4. Key requirements, inspector's related checks and non-conformity types

4.1 Key scheme requirements related to input materials with respect to physical contaminants

Inspectors and certification officers must carefully check compost producer compliance with the following requirements of PAS 100:2011, the Compost Quality Protocol and AfOR's Compost Certification Scheme:

- ✓ PAS 100:2011, clause 6.1.1
Input materials to the composting process shall be source segregated biowastes and/or source segregated biodegradable materials. Care shall be taken to avoid any potentially polluting wastes, product or materials from becoming included with the input materials.
 - ✓ PAS 100:2011, clause 6.1.3
If biowastes are delivered for processing but include packaging that does not comply with the requirements in 6.1.4 (see below), a pre-composting treatment step shall remove any non-biodegradable packaging prior to feeding those biowastes into the composting process.
 - ✓ PAS 100:2011, clause 6.1.4
*Biodegradable polymers, bags, packaging or other products made of such material shall be allowed as input materials to the composting process if they **conform** to the "compostable" criteria within BS EN 13432, BS EN 14995, DIN V 54900, ASTM D6400, or AIB-Vinçotte International S.A.'s 'Program OK 2' criteria for "home compostable" packaging, plastics or equivalent.*
 - ✓ AfOR's Compost Certification Scheme Rules, clause 20.4
*Biodegradable polymers, bags, packaging or other products made of such material shall be allowed as input materials to the composting process if they **have a valid certificate of conformity** to the "compostable" criteria within BS EN 13432, BS EN 14995, DIN V 54900, ASTM D6400, or AIB-Vinçotte International S.A.'s 'Program OK 2' criteria for "home compostable" packaging, plastics or equivalent.*
These scheme rules require that the valid certificate has been issued by an independent certification body, going further than PAS 100:2011's clause 6.1.4 requirements.
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- ✓ Compost Quality Protocol, Appendix B (allowed input wastes)
 - + 15 01 02 *Plastic packaging* (the same conditions apply as those described in clause 20.4 of the Scheme Rules above)
 - + 20 01 39 *Plastics. Allowed only if independently certified compliant with European standard EN 14995 and used for collection of source-segregated biowastes.* (Note plastic items that are not 'used for collection of source-segregated biowastes' such as cutlery and plastic-coated plates / cups are not currently allowed as inputs to a composting process that must comply with the Compost Quality Protocol, even if they are independently certified compliant with European standard EN 14995.)
 - + 15 01 01 *Paper and cardboard packaging: Not allowed if non-biodegradable coating preserving substances present.*
 - + 20 01 01 *Paper and cardboard: Not allowed if non-biodegradable coating preserving substances present.*
 - + The above restrictions also apply to waste streams 20 01 08 (biodegradable kitchen and canteen wastes) and 20 02 01 (biodegradable wastes e.g. garden wastes) when they include any of the waste materials listed above.

- ✓ PAS 100:2011, clause 6.1.7, first part
The composter's appropriate QMS document shall state criteria for the acceptance of input materials and rejection of unsuitable input waste/materials, based on the HACCP Plan.

- ✓ PAS 100:2011, clause 6.1.7, second part
The criteria shall also require the input material supplier to demonstrate that all practicable measures have been taken to prevent contamination of input materials with unsuitable wastes/materials.

- ✓ PAS 100:2011, clause 6.1.9
Each delivery of input material shall be inspected at a location where there is adequate control of risk of cross-contamination between the delivered load and any input materials already accepted for composting, materials undergoing composting or fully composted materials in storage.

- ✓ PAS 100:2011, clause 6.1.10
For each of any input material load or part-load rejected after delivery, the composter shall make and keep a record of the input material type rejected, source, quantity, date rejected, reason for rejection and to whom it was sent.

4.2 Inspector's related checks

During the site visit inspectors should carefully check:

- ✓ the visual appearance (quality) of delivered biowastes (prior to any pre-composting process),
- ✓ any pre-composting step aimed at removing any non-compostable packaging prior to feeding the biowastes into the composting process (e.g. a depackaging unit),

- ✓ any pre-composting step that aims to acceptably reduce physical contaminants in biowastes accepted for composting⁶ (e.g. a picking line),
- ✓ storage provisions for removed physical contaminants awaiting rejection from the composting site,
- ✓ the visual appearance (quality) of any biowastes accepted for composting (after any applicable pre-composting step) but still stockpiled prior to being fed into the composting process,
- ✓ the visual appearance (quality) of the material being composted,
- ✓ any post-composting step that aims to acceptably reduce physical contaminants in the composted material (e.g. screening, wind-sifting),
- ✓ the visual appearance (quality) of the compost, the physical contaminant test results for compost samples that have undergone laboratory tests and the particle size distribution results; the particle size distribution results represent an approximate indicator of the particle size range characterising a specific compost grade; and
- ✓ records of communications with the biowaste suppliers, particularly in the event that contamination has occurred.

Inspectors should also check for composter records of rejected biowaste loads or part-loads, and dispatch of 'physical contaminant' container loads for off-site disposal (sorted on site from delivered biowaste, placed into physical contaminants' container). AfOR appreciates that the inspector's assessment is based on the composter's records of rejected loads / part-loads and physical contaminant container dispatches since joining the certification scheme or since the last inspection.

If no loads or part-loads have been rejected over that period, the inspector would need to satisfy himself / herself that:

- a) the quality of biowaste arriving for composting has been complying with the acceptance criteria,
- b) the composter has been following pre-composting procedures that remove sufficient physical contaminants from the biowaste before it is fed into the composting process, and
- c) regardless whether the scenario fits a) or b) that there are records of physical contaminant container dispatches, unless the composter can show that the delivered biowastes have contained no physical contaminants or that that container has only been part filled since the composter joined the scheme or began his/her renewal phase.
- d) The composter has been implementing the methods and processes agreed in there SOP or similar.

4.3 Assigning a non-conformance

A non-conformance should be assigned when in the inspector's view one or more requirements described in section 4.1 of this guidance is not complied with. Examples of non-conformances are:

⁶ Whenever referred to within this document, 'accepted for composting' means 'fed into the composting process after any applicable pre-composting process'.

1. the composter's criteria specified in the SOPs for biowastes accepted for composting allow an 'inappropriately high level of physical contaminants'⁷ or the criteria are unclear in terms of types of physical contaminants, what the acceptable level(s) is, and exactly where that level / those levels apply (delivered biowaste prior to pre-treatment, pre-treated biowaste fed into the composting process);
2. the biowaste accepted for composting does not comply with the composter's corresponding acceptance criteria for physical contaminants;
3. the certified compost grade appears to have a significant level of physical contaminants and the inspector doubts that the compost complies with the PAS 100 minimum quality criteria with reference to physical contaminants; and/or
4. the certified compost grade appears to have a significant level of physical contaminants and the inspector doubts that the compost complies with an additional quality specification for that compost grade that the composter has committed to meeting in his/her quality policy or agreed in writing with the customer who will receive that compost.

When non-conformities such as those described above occur, certification bodies should take photographs, as these can be an essential form of evidence.

4.4 Non-conformity types and corrective action checks

4.4.1 Non-conformance type 1

The composter's criteria specified in the SOPs for biowastes accepted for composting allow an 'inappropriately high level of physical contaminants'² or the criteria are unclear in terms of types of physical contaminants, what the acceptable level(s) is, and exactly where that level / those levels apply (delivered biowaste prior to pre-treatment, pre-treated biowaste fed into the composting process).

The inspector should check in the composter's relevant QMS documents whether the composter's criteria for biowastes a) delivered and b) accepted for composting (e.g. after any applicable pre-composting step) are suitable and clear in terms of the level(s) of physical contamination accepted and the types of material classed as 'physical contaminants'. Those criteria must be clear on what is allowed (e.g. plain or certified 'compostable'/'home compostable' paper/cardboard, newspaper and certified 'compostable'/'home compostable' packaging/plastics which is not 'physical contaminant') and what is not allowed (e.g. non-plain or paper/cardboard and packaging/plastics that are not certified 'compostable'/'home compostable' which is 'physical contaminant').

⁷ 'Inappropriately high levels of physical contaminants' means levels that do not enable the composter to consistently achieve the minimum compost quality required by PAS 100:2011, even in spite of any pre-and post-composting steps or any other control points adopted.

Physical contaminants are not allowed to be present in the biowaste unless they represent an amount (regarded as incidental contamination) that does not exceed the maximum level(s) allowed in the composter's input materials acceptance criteria.

If a non-conformance is assigned because inappropriately high levels of physical contaminants are specified in the relevant QMS document, the composter is expected to reduce the level of physical contaminants that the acceptance criteria allow. In addition, if the composter has specified inadequate acceptance criteria to enable him/her to process input materials with inadequately high levels of contaminants, the composter would also have to demonstrate, as part of the corrective action, reduced levels of physical contaminants in such materials.

If the composter's acceptance criteria are descriptions (e.g. 'low level of physical contaminants') rather than numbers (e.g. ' ≤ 2.5 % m/m fresh mass in the biowaste accepted for composting' or ' ≤ 5.0 % m/m in the biowaste accepted for composting'), please instruct the composter to clarify the criteria in the SOPs / HACCP before assessing and deciding whether to issue a non-conformance type 2.

Assigning a non-conformance type 2 should incentivise composters to provide feedback to their biowaste suppliers on the quality of that material and put pressure on them to improve its quality. Any non-conformance type 2 that may result into compost unfit for purpose shall be reported to the regulator.

4.4.2 Non-conformance type 2

The biowaste accepted for composting does not comply with the composter's corresponding acceptance criteria for physical contaminants.

If the composter disputes that the inspector's decision that physical contaminants in the biowaste accepted for composting exceed the composter's corresponding criteria, then an independent quantitative and qualitative assessment of the levels of contaminants in the waste materials will have to be carried out, overseen by the certification body. The certification body shall inform the composter of any costs associated with overseeing this assessment.

Corrective actions may include:

- a) biowaste suppliers and composters will have to work together to reduce physical contaminants in the biowastes delivered such that when the composter accepts them for composting they comply with the composter's acceptance criteria for composting; and/or
- b) the composter utilising manual picking and/or another control measure that reduces physical contaminants in the pre-treated biowastes such that they comply with the composter's acceptance criteria for composting.

With regard to corrective actions a), the inspector should ask the composter to show him/her any record(s) of the communications / feedback between the composter and his/her relevant biowaste suppliers about unacceptable physical contamination having occurred.

In addition, in the case of corrective action type a) although the composter and relevant biowaste supplier(s) may be able to show that communications and steps have been taken towards reducing physical contaminants in the biowastes, the inspector will have to check that biowaste accepted for composting actually complies with the composter's corresponding

criteria before the corrective action is deemed satisfactory. This may require the inspector to visit the composting site as soon as possible after the composter notifies that the corrective action has been taken, if deemed appropriate by the certification body.

However, even if the composter and relevant biowaste supplier(s) have taken steps to reduce physical contamination, if physical contaminants in the biowaste accepted for composting still exceed the composter's corresponding criteria and result in compost unfit for purpose, there has still not been sufficient corrective action in response to a non-compliance type 2. This shall result in the suspension of the certificate.

With regard to corrective action b), the inspector should ask the composter to tell him/her about any actions taken by the relevant biowaste supplier(s) to reduce physical contamination to an acceptably low level, i.e. a level that does not exceed the composter's acceptance criteria for composting or a level in the delivered biowaste at which the composter can cost-effectively remove physical contaminants before the biowaste is composted.

4.4.3 Non-conformance types 3 and 4:

The certified compost grade appears to have a significant level of physical contaminants and the inspector doubts that the compost complies with the PAS 100 minimum quality criteria with reference to physical contaminants; or

The certified compost grade appears to have a significant level of physical contaminants and the inspector doubts that the compost complies with an additional quality specification for that compost grade that the composter has committed to meeting in his/her quality policy or agreed in writing with the customer who will receive that compost.

Under these circumstances the inspector shall take a sample of the visually contaminated compost grade (by following AfOR's compost sampling guidelines⁸) and send it to an AfOR Approved Laboratory for testing physical contaminants. Alternatively, the inspector could witness the compost producer taking the sample, preparing it and dispatching it to the AfOR Approved Laboratory. The certification body can decide at its own discretion whether the cost of testing shall be borne by the composter. The regulator shall be informed promptly of this level of non-compliance and advice sought with regard to the use and final destination of material produced.

Each relevant biowaste supplier shall be asked by the composter to take actions that reduce the physical contaminants in the delivered biowaste, such that those contaminants do not exceed the maximum allowed in the composter's acceptance criteria for composting.

4.5 Certificate suspension

Suspension of certification should be actioned promptly if any of the above non-compliances result into compost being unfit for purpose (namely, not compliant with PAS 100 minimum quality criteria and any other additional specification subscribed to by the composter).

⁸ CBs have been trained by AfOR to carry out sampling according to AfOR sampling protocol.

ANNEX 1. Information that should be printed on packaging / bags / other items independently certified to 'compostable' criteria

Compostable [industrial]



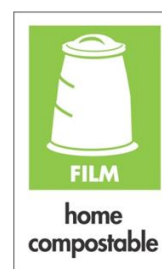
Sxx



compostable

7P####

Home compostable



012345/AB



Sxx

The product manufacturer may be utilising individual materials which have been registered as 'compostable' but may also be printing on, adding materials and/or additives that are not, thus the final product would not meet the requirements of EN 13432.

Certified compostable 'products' (not individual materials) will either display a 7P (Din Certco) or Sxx (Vinçotte) code; only these two code combinations represent certified final products. Similarly, a product which does not display a valid 7P or Sxx code but just one of the logos described in this guide has not been certified.

Information available to help: [Short guidance to compostable products](#)

Industrial: [AfOR's web page with certified products search engine](#)

Home compostable: [AfOR's web page with certified products](#)

Biowaste collections: <http://organics-recycling.org.uk/collections>