# Compost and Digestate Physical Contaminants & Stones test method revisions consultation

## Background

Renewable Energy Assurance Limited (REAL) administers both the Compost Certification Scheme (CCS) and Biofertiliser Certification Scheme (BCS).

The quality of materials produced under CCS and BCS are assessed against parameters specified in PAS100:2018 for compost and PAS110:2014 for digestate respectively. These standards reference specific test methods for various quality criteria including, but not limited to, physical contaminants and stones (PC&S).

The current version of the PC&S test method for compost, as referenced in PAS100:2018, is the REAL MT PC&S. This method was initially developed and issued by the Association for Organics Recycling (AfOR), with its latest update occurring in 2012. In 2018, REAL took over responsibility for the method, issuing the current version to CCS Approved Laboratories in 2020.

The PC&S test method for digestate, as referenced in PAS110:2014, is an NRM Laboratories internal standard operating procedure (SOP) JAS-497/001.

The move from Environment Agency (EA) Quality Protocols (QPs) to Resource Frameworks (RFs) in England (expected to also be adopted in Northern Ireland and Wales) (RF Newsletter) will result in UK wide reduced plastic limits to those found in PAS100:2018 and PAS110:2014. The plastic limit reductions raise issues for the current PC&S test method versions and test reporting. These issues were investigated recently in the REAL Research Hub project 'Plastic contamination method assessment' (Research Hub Plastics Project).

A separate digestate PC&S test issue was identified when a BCS operator had a test failure for 'sharps'. The identified issue is relevant to the compost PC&S test also.

In June 2025, REAL formed the Test Method Working Group (TMWG). The purpose of the TMWG established by REAL is to provide strategic oversight and continuous improvement of testing methodologies for organic recycling certification schemes. The first project of the TMWG was to consider the key identified issues, and available evidence, and propose changes to the methods for wider stakeholder consultation. Three issues were considered by the TMWG as follows:

1. Organic contamination of physical (plastic) contaminants
2. Reporting and weighing accuracy and uncertainty
3. Sharps determination

## Issues and TMWG proposed changes

### 1) Organic contamination of physical (plastic) contaminants

The abundance of physical (plastic) contaminants is compost and digestate is assessed by weighing contaminants isolated from a subsample and by determining mass relative to the mass of the subsample used. The digestate and compost PC&S methods do not indicate whether isolated contaminants should be cleaned or not following drying and prior to weighing. Therefore, any residual compost or digestate material on the isolated physical (plastic) contaminants when weighed will result in higher apparent abundance.

The REAL Research Hub project on 'plastic contaminant assessment methods' (project 6) found, through engagement with Approved Laboratories, inconsistency in respect of whether physical (plastic) contaminants were cleaned prior to weighing or not. A clear statement is lacking from the current PC&S test methods of whether to clean or not physical (plastic) contaminants prior to weighing.

The REAL Research Hub project on 'plastic contaminant assessment methods' also presents data showing how cleaning isolated plastic contaminants from compost affects results for a range of compost samples. Both 'dry' and 'wet' cleaning were considered in the project with dry showing greatest improvement with least analyst time and test method steps. Specifically, the dry approach trialed involved rubbing of film and fibre plastic contaminants between finger and thumb. For rigid plastic contaminants, a pair of tweezers was used to remove organic material from both smooth and rough surfaces, as well as crevices.

The dry-cleaning approach was suggested to the TMWG for inclusion in the PC&S methods as part of the discussion on this issue. Concern was raised in TMWG discussions about whether the rubbing dry-cleaning method could be applied consistently by the Approved Laboratories. There was also concern about fragmentation of plastic fragments.

A simpler and gentler cleaning approach was discussed by the TMWG in a follow-on meeting and agreed by the TMWG.

**PROPOSED TECHNICAL CHANGE 1**

The TMWG agreed and propose the following text addition for both PC&S methods:

*Remove loosely bound organic material from physical contaminants prior to weighing as necessary using a soft bristle brush (e.g., small paint brush). Do not unfold or rub physical contaminants to clean them of trapped or tightly bound organic material.*

### 2) Reporting and weighing accuracy

As above, the move from EA QPs to EA RFs in England (expected to also be adopted in Northern Ireland and Wales) will result in UK wide reduced plastic limits. This regulator driven industry change has implications for plastic contaminant reporting and weighing accuracy and uncertainty. Essentially, lower plastic limits mean the amount of plastic needed to fail the plastic PC&S test component is significantly less. This is especially the case for digestate, where the new limit for plastic is 8% of the current limit for all physical contaminants.

Currently the digestate PC&S method does not specify the requirement to report plastic contaminants separately from total physical contaminants or the type of analytical balance used for weighing physical

(plastic) contaminants. Therefore, these details were considered necessary to add to the digestate PC&S method.

As part of the REAL Research Hub project on plastic contaminant method assessment, the possibility of using a 5 decimal place (dp) balance with integrated deionizer was considered to improve weighing accuracy and uncertainty. However, consulting Approved Laboratory representatives during the Research Hub project it was felt it would be difficult to find a suitable space in the laboratory for such a precise balance. When discussed with the TMWG, there was agreement that 5 dp balances, although more precise, may not significantly improve the accuracy of the method as a whole i.e., when other aspects of the method including sampling were also considered. Therefore, it was agreed that a minimum 4 dp balance should be used and wider aspects of the method (including sampling) considered in the future.

With the lower plastic limits, 2 dp reporting (as found in PAS110:2014) does not provide sufficient resolution to determine pass/fail against the nitrogen (N) based plastic limits (Table 1). The TMWG agreed that given physical (plastic) contaminants would be weighted to 4 dp, then reporting should be to 3 rather than 4 dp. Report to 3 dp allows pass/fail to be determined for all N based limits as shown.

Table 1. New digestate plastic limits reporting to 2, 3 and 4 dp

| Total N (%) | kg/t | <1 | 1-1.9 | 2-2.9 | 3-3.9 | 4-4.9 | 5-5.9 | 6-6.9 | 7-7.9 | 8-8.9 | 9 or more |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8% 2 dp | kg/t | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 |
| 8% 3 dp | | 0.003 | 0.006 | 0.009 | 0.011 | 0.014 | 0.018 | 0.020 | 0.023 | 0.026 | 0.029 |
| 8% 4 dp | | 0.0032 | 0.0056 | 0.0088 | 0.0112 | 0.0144 | 0.0178 | 0.0200 | 0.0232 | 0.0256 | 0.0288 |

The implications of reducing the plastic limit are less critical for compost PC&S reporting and weighing accuracy and uncertainty. However, the current compost PC&S method specifies only a 2 dp balance for weighing physical (plastic) contaminants, whilst reporting to this same level i.e. 2 dp.

Discussion with the Approved Laboratories during the REAL Research Hub project on plastic contamination assessment found general support for increasing physical (plastic) contaminant weighing accuracy by moving from using a 2 to 4 dp balance. As 4 dp balances are generally found in laboratories carrying out there would be little/no cost implication for compost producers with this change.

By increasing accuracy of weighing to 4 dp in the compost PC&S method, the TMWG agreed reporting to 3 dp to improve plastic contaminant result resolution e.g., a result of 0.06 % m/m could be either a pass or fail whereas reporting to 3 dp this could be clearly seen as a fail (0.060 % m/m) or pass (0.059 % m/m).

**PROPOSED TECHNICAL CHANGE 2**

The TMWG agreed and propose the following changes to the digestate PC&S method

- Adding detail on reporting plastic contaminants separately from total physical contaminants
- Specifying that weighing of physical (plastic) contaminants should be carried out using a minimum 4 dp balance and reported to 3 dp

The TMWG agreed and propose the following changes to the compost PC&S method

- Specifying that weighing of physical contaminants should be carried out using a 4 dp balance and reported to 3 dp

## 3) Sharps determination

In 2023, a BCS operator queried a test failure on 'sharps', part of both the compost and digestate PC&S test methods. Specifically, the operator questioned the failure on the basis the offending suspected sharp was a piece of plastic (approx. 10 mm in diameter).

The PAS110:2014 (and similar PAS100:2018) sharp definitions are clear that plastic greater than 2 mm may be sharp. The PAS110:2014 definition of sharps (clause 3.66) as follows:

*Man-made contaminants that are greater than 2 mm in any dimension that might cause physical injury to a person who handles digestates without protective gloves or to a person or animal who comes in contact with these materials.*

Despite the suspect sharp fitting the definition in terms of material type and size, REAL agreed that assessing whether any specific physical contaminant (plastic or other man-made contaminant) was sharp or not was subjective and placed significant burden on a single laboratory analyst to make a critical decision.

No scheme-related research project has focused specifically on sharps. Research by the TMWG in considering this issue found limited / no real research on sharps from compost / digestates and resulting injuries to animals and humans.

Despite the lack of research on this issue the TMWG agreed a proposed change to digestate PC&S method to improve intra-laboratory consistency in sharps assessment. The proposed change also applicable to the compost PC&S method.

The TMWG also agreed a system for knowledge sharing between Approved Laboratories and REAL of sharps confirmed via the above towards improving inter-laboratory consistency in sharps assessment.

**PROPOSED TECHNICAL CHANGE 3**

The TMWG agreed and propose the follow text addition to both compost and digestate PC&S methods:

*Each suspect sharp should be confirmed as sharp by a second person in the laboratory with experience of the method. If the second person agrees with the first person, the sharp is confirmed. If the second person does not agree, a third person (e.g., laboratory manager) will take a final decision.*

Further clarification text was proposed to the TMWG for inclusion in the compost PC&S method as follows. The TMWG agreed with this inclusion. Although considered less probable for digestate samples, the TMWG agreed this additional clarification text should be included in the digestate PC&S method for completeness and consistency.

*Physical contaminants whose original intended use was to penetrate or cut (e.g., hypodermic needles, metal screws/nails/pins, blades) are likely to be classified as sharps unless their form has changed significantly rendering them no longer 'sharp'.*

## Have your say on these proposed changes

If you have comments or wish to raise concerns about one or more of the proposed changes, please respond by **31st October 2025**.

Comments should be sent by email to thomas@realschemes.org.uk. The subject of the email should state 'Compost and Digestate PC&S test method revisions consultation'.

In the email itself please clearly identify the issue your comment(s) relate to i.e., 1) Organic contamination of physical (plastic) contaminants, 2) Reporting and weighing accuracy and uncertainty, 3) Sharps determination.

If you have questions/issues to raise about the PC&S methods not identified above, the TMWG, or this consultation process please add these under 4) Other comments.