

REA's Response to BSI Consultation on the Draft PAS 110 Specification for whole digestate, separated liquor and separated fibre derived from the anaerobic digestion of source-segregated biodegradable materials

The Renewable Energy Association (REA) welcomes the opportunity to comment on the BSI consultation on PAS 110 Specification.

REA was established in 2001, as a not-for-profit trade association, representing British renewable energy producers and promoting the use of renewable energy in the UK.

The Organics Recycling Group (ORG) of REA is a sector group focused on promoting the sustainable management of biodegradable resources, covering both aerobic and anaerobic technologies. It promotes the benefits of composting, digestion, and other biological treatment techniques and the use of biologically treated materials for the enhancement of the environment, business and society (see www.organics-recycling.org.uk) for more information. This group specializes in issues covering the collection, treatment and use of biodegradable resources, to complement the generic work undertaken by REA's Biogas Group, which focuses on energy policies. The Biogas Group, another sector group within REA, has been the unifying force championing the biogas industry in the UK, playing a major role in delivering the expansion that we are now seeing.

The ORG and the Biogas Group have been working very closely throughout the review of PAS 110.

Introduction on the consultation

The formal process to review PAS 110 Specification started in May 2014. REA has been involved and has engaged with its members throughout the entire process.

A draft PAS 110 was released by BSI for public consultation on 6th December 2013. A copy of the draft, alongside other supporting documents, can be found at www.organics-recycling.org.uk/PAS110.

REA has consulted with its members extensively with regard to this consultation. This document contains REA's response to this consultation and, where possible, reflects the views of REA's members. REA would welcome the opportunity to discuss with BSI any of the points raised in this response.

REA response to the consultation

Pasteurisation exemptions, REA's view

Clause 7.2.1

Overall we agree with the content of this clause; however the first bullet point of 7.2.1 b) should include reference to the maximum particle size required under the ABP regulations (12 mm) as well as to the required temperature (70 °) and timescale (1 hour).

Clause 7.2.2.

Overall we agree with the content of this clause. However the clause does not highlight that users must be alerted to the risk of taking digestates from unpasteurised feedstocks, as highlighted in section 1 of the consultation supporting document. We consider it crucial that additional text is added to this clause requiring that end users are informed about the risk of applying digestates that have been produced from unpasteurised materials within a co-operative.

We therefore request that the text of this clause is replaced as follows (new text in red):

'7.2.2 Digested materials made only from manure, unprocessed crops, processed crops, crop residues, glycerol, and/or used animal bedding that arise within a single holding or a cooperative and after digestion are returned to and used entirely within the same premises or holding or co-operative (as defined in 3.28) are exempt from the pasteurisation step (7.2.1). However, the producer shall determine the process steps, the CCP and its CLs (e.g. minimum timescale and suitable mesophilic temperature range) that are effective for producing digested materials of the quality required in this PAS. Those receiving digestate must be alerted and agree in writing to the omission of specific phytohygiene management and that the digestate is of sufficient quality for their purposes.'

PTE limit levels:

The draft PAS 110 includes three possible approaches to derivation of limit levels for PTEs. These are shown on pages 36-37 (table 1) of the draft PAS 110 out for consultation. The same options are then repeated in Tables 2, 3 and 5 (you can read the rationale behind these options under section 2 of the consultation supporting document).

REA's view

In light of the views expressed by REA's members who provided feedback, REA supports option 1 for inclusion in Tables 1, 2, 3 and 5 of the PAS 110, as it was the option supported by the largest number of members. This option pegs digestate PTE levels to digestate N-tot concentrations. This approach will provide digestate users with confidence that PTEs in PAS 110 digestates will not be applied at rates that would exceed those considered acceptable for PAS 100 composts. This has also the advantage of creating a level playing field across compost and digestate products. We have summarised below our members' views regarding the options specified for PTE limit levels.

- 1) Most of the member operators that have provided feedback to REA are pleased to see that reporting of PTEs is proposed on a fresh weight basis, not on a dry weight basis. One of our members stated 'This brings the reporting in line with the

way our digestate is marketed and makes any laboratory results more straightforward to present to clients'.

- 2) Nine members of REA provided feedback on their preferred options. Four out of nine said they prefer option 1, because it provides flexibility to operators taking different inputs and creates a level playing field, while recognising the different N loads of these materials. The members that expressed a preference for option 2 (one out of nine) said that this is because it addresses the problem of dry matter destruction and ensure annual loadings are lower than those from PAS 100 composts. The members that expressed a preference for option 3 (three out of nine) said that this is because it provides for both, liquid and fibre, high N and low N products and that, 'whilst option 2 is the simplest option, it does not provide the tighter controls that we see in Option 3 for some digestates'. In addition, as highlighted by WRAP supporting document, Option 2 has the disadvantage of having no built-in PTE application rate limiter, which may give rise to excessive PTE applications where digestates are applied at extremely high rates. Option 3 on the other hand does not take into account a great enough range.
- 3) An operator member commented that it would be ideal to have loading rate limits for each PTE and, if any of these limits is reached prior to the N loading, then this should dictate the maximum digestate that can be spread to land. The operator said 'thinking about any of our clients (mainly farmers) who may go for PAS110 in the future, it is likely that a digester fed pig slurry will fail the PTE test outright due to the PTE limits set within the digestate itself, however the limit was based on PTE application rates per ha then this would allow digesters with this feedstock to qualify for PAS.'
- 4) One member consultant expressed concerns over reporting the PTE limit levels on a fresh matter basis. This member highlighted that 'Results based on dry matter leaves little or no opportunity for variability in cross reference between plants/samples as everything is 100% DM, or near to it. With the proposal for values to be based on fresh weight, and even worse ranges for different dry matters or total N content there is a huge potential for variability in materials, and it is possible that data could be manipulated to move material from one class to another.'

Physical contaminant levels

The draft PAS 110 includes four possible approaches to derivation of limit levels for physical contaminants and stones. These are shown on pages 36-37 (table 1) of the draft PAS 110 out for consultation. The same options are then repeated in Tables 2, 3 and 5 (you can read the rationale behind these options under section 3 of the consultation supporting document.)

REA' s view

In light of the views expressed by REA's members, REA is unable to support any of the options specified in the draft PAS 110 in their entirety.

REA supports the approaches used to derive Option 2 and Option 3 (but not the limit levels specified in option 2 or the limited ranges of Tot-N in option 3), as these are the two approaches supported by the largest number of members.

In light of feedback provided by some members, REA is concerned that Option 2 allows for excessive amounts of physical contaminants and stones to be applied to land which may be detrimental to the digestate quality and undermine the end users' confidence in PAS 110 digestates.

We recommend that an amended version of option 2 or 3 is agreed during the PAS 110 Steering Group meeting being held on 5th February.

We have summarised below our members' views regarding the options specified for PTE limit levels.

Most of the member operators that have provided feedback to REA are pleased to see that reporting of physical contaminants and stones is proposed on a fresh weight basis, not on a dry weight basis. The current approach results in an array of different levels being applied based on the dry matter of the digestate. To put this into context, assuming worst case of 1% nitrogen you could apply 125kg/ha of PC if you had a dry matter of 10%, this compares to just 12.5kg/ha if you had a DM of 1% under the existing standard.

Nine members of REA provided feedback on their preferred options. Three out of nine said they prefer **option 2 as it is**, because it provides flexibility to operators under different circumstances and creates a level playing field, while recognising the different N loads of these materials. These members highlighted that the limits set should apply equally to whole digestate and any separated fractions as the basis of this approach is to put a ceiling on the amount of plastic per ha rather than allowing differing rates; this achieves the environmental objective of minimising plastic/contaminants and creates a level playing field.

None of the members have supported **option 1**. The members that expressed a preference for **option 3** (three out of nine) said that this is because it offers the tightest controls on the most visible contaminants that can jeopardise the quality of the products and the end users confidence in them.

Disadvantages of the three options specified in the draft PAS 110:

Option 1: an operator commented that this option does not allow for the differing levels of nitrogen, meaning that an operator with a low N level can apply more plastic to land than someone with higher N; this does not create a level playing field and also could influence perception over the quality of the digested material. I.e. a farmer receiving low N fibre material would end up with a much higher plastic contamination level than the farmer down the road receiving a liquid product, this would be exaggerated further if the liquid product was higher in N.

Option 3: An operator commented: 'by only having an option of ≤ 3 or >3 it does restrict the majority of digestate to very stringent levels, the range in the table is not considered great enough. The operator said 'our digestate is consistently >6 of N and

therefore we would apply half of what an operator at an N content of 3 would. This does not create a fair playing field.'

Option 2: Two members expressed a strong concern that option 2 allows for excessive and unacceptable levels of stones to be applied to land. Two operator members expressed a strong concern that physical contaminants loadings allowed for PAS 100 composts are too high and would not be considered acceptable by their customers. If allowed, they would jeopardise their markets. It is also worth pointing out that some of the stakeholders who are part of the PAS 110 Steering Group expressed a concern that physical contaminants and stones present in liquid digestates can be more detrimental to the soils than when present in composts or fibre digestates. This is because once the liquid has gone into the soil (after a surface application of soil injection) the plastic physical contaminants may be left visible on top of the soil.

An AD operator member commented that the approach used in option 2, which pegs digestate physical contaminants to digestate N-tot concentrations is the right one; however the limits should be set more stringent than the PAS 100 levels to demonstrate a willingness on the part of the AD industry to exceed the standards considered acceptable for PAS 100 composts. This operator has proposed an alternative approach which, like option 2:

- pegs digestate physical contaminants to digestate N-tot concentrations
- applies equally to whole digestates and any separated fractions
- sets a ceiling for the amount of physical contaminants that can be applied to land per hectare.

However, unlike option 2, in the worst case scenario (1 Kg/t of Nitrogen in digestate) this approach would allow a maximum of 25 Kg/ha of contaminants to be applied to land (as opposed to 50 Kg/ha allowed for PAS 100 composts). The limit levels proposed for physical contaminants under this approach are show below.

Option 2 (proposed by Biogen)	Applies equally to all digestates & digestate fractions									
N-tot content (kg/t) fresh weight	1	2	3	4	5	6	7	8	9	10
Tot PC limit (kg/t) fresh weight	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1

REA' s view

In the opinion of REA, the approach proposed by this member or an amended version of option 3 that includes further ranges of Tot-N values would be more appropriate than the currently specified options. A consensus on such modified versions of options 2 or 3 can be achieved during the PAS 110 Steering Group meeting on 5th February.

Residual Biogas Potential

Background

A proposal ('[RBP proposal](#)') to refine the existing limit level for the Residual Biogas Potential (RBP) test was submitted by REA and other trade bodies to the regulator and the Steering Group on 7th November 2012. The proposal included two possible approaches (for the RBP limit level and the method for evaluating compliance with the limit level). In brief,

- option 1 advocated a rolling average approach with an absolute maximum level of 0.5 l biogas / g VS, and
- option 2 advocated retaining the current approach (on a sample per sample basis) for evaluating compliance with the limit level, but with an absolute maximum level of 0.5 l biogas / g VS.

The regulator responded to the trade bodies' proposal on 27/11/2013. The response can be summarised as follows:

- the regulator does not object to the rolling average approach given as option 1 of your document, but with the rolling average set as 0.4l/kg VS and a maximum level of 0.5l/kg VS; and
- the regulator does not support option 2.

The regulator's feedback is based on the fact that data on RBP tests related to AD operators on the BCS have shown that 0.4 l biogas/g VS is a level that AD operators registered on the BCS can reasonably achieve, but even achieving that level remains challenging and that there may be occasional spikes measured at higher levels.

In his response the regulator has also highlighted that 'the rolling average should not be completely open-ended but should be limited, for example, to results within a maximum 12 months period, or to the last 3 results, depending on the frequency of testing.'

REA' s view

REA welcomes the response given by the regulator on 27th November. This is a step in the right direction.

However we reiterate that the environmental regulator has not provided yet a full rationale behind the inclusion of this test in the PAS 110 and the AD Quality Protocol and that this should be provided in the near future.

Given the regulator's response, it is important to highlight to REA's members that option 2 specified in the draft PAS 110 can no longer be considered, as this option is not endorsed by the regulator. In addition, option 1 can only be considered in the amended version endorsed by the regulator (rolling average at 0.4, maximum level at 0.5 l/kg VS).

We reiterate once again that the current RBP test is expensive and time consuming. Replacing it in the future is widely supported by the industry. Once the PAS 110 review has been completed, the industry should look at other parameters that are easier, cheaper and quicker to measure. However for the time being, given the considerable delay this review has already been subjected to, and in order to avoid further delay, we are left with no choice but supporting a retention of the current test method and a refinement of its limit level to a more appropriate level.

We welcome the inclusion in the PAS 110 of alternative methods for determining the stability where those alternatives also meet the stated objectives of the environmental regulators. This should facilitate the use of an alternative test in the future and the development of new tests which are shorter and cheaper than the current RBP.

We are not supporting the move to a 10-day RBP test as there isn't currently sufficient evidence that supports the setting of a new limit level based on the RBP 10th day results.

In summary, REA supports the following approach:

A rolling average approach based on which compliance with the standard is evaluated on the basis of the arithmetic average calculated from a suitable number of samples. The rolling average should not be completely open-ended but should be limited, for example, to results within a maximum 12 months period, or to the last 3 results, depending on the frequency of testing. The rolling average should be set at 0.4 l biogas / g VS, but with a maximum level for any one sample of 0.5 l biogas / g VS.

Further REA's considerations and members' feedback are summarised below.

- Some of the operators that provided feedback to REA said they would support option 2. However, as explained above, this is no longer a possible option if the industry wants the PAS 110 to be endorsed by the regulator (and thus in the Anaerobic Digestate Quality Protocol).
- The wording regarding the rolling average set as 0.4l/kg VS and a maximum level of 0.5l/kg VS must be carefully considered and made clear, for avoidance of doubt, to ensure operators fully understand the changes.
- A member of REA commented that when a spike (> 0.5 l biogas/g VS) occurs while the rolling average is still within 0.4 l biogas/g VS, this should immediately

trigger additional RBP testing to ensure that this is indeed a spike and not an increasing trend that needs further investigation. With only testing every 6 months during the renewal period, a spike > 0.5 l biogas/g VS could mean that over 6 months this value actually increases and is not picked up until the next scheduled test months down the line.

Proposed actions in the event of test failures:

- In the event that the arithmetic mean exceeds 0.4 l biogas / g VS, extra samples should be tested for the RBP until the rolling arithmetic mean returns to be within 0.4 l biogas / g VS.
- With regard to the latest sampled portion which caused the rolling average to exceed the limit, this should be dealt with as a non-conforming portion of production. Any other portion mixed with it would also be classed as non-conforming. Any portion subsequently produced is also non-conforming until the rolling average conforms to the limit level.
- In the event that the RBP result of any one sample exceeds the maximum of 0.5 l biogas / g VS but the rolling average is still within 0.4 l biogas / g VS, the portion of production that exceeded 0.5 l biogas / g VS should be dealt with as a non-conforming portion of production. Any other portion mixed with it would also be non-conforming. Extra samples of portions of productions should be promptly tested for RBP to check that the rolling average is still within 0.4 l biogas / g VS.

Significant changes

Section 4.8.4

“If any significant, non-temporary change in input materials, production process management or required quality of digested materials occurs, the production process shall be re-validated. **An addition or removal of one or more input material types represents a significant, non-temporary change**”.

REA strongly requests that the sentence above is deleted.

A member of REA commented ‘A change of one or more input material types may be negligible, particularly in a large plant and where the volume of that new feedstock is minimal (drop in the ocean). Where pre-acceptance checks are done and the risk deemed low, this is too onerous and would involve many plants going back through validation multiple times in any one year! Clarification is needed or a note adding which states that ‘a justification can be presented to the certification body in cases where the operator does not believe the addition of new feedstock type constitutes a significant change, such justification will be assessed on an individual case by case basis by the certification body’ or words to that effect.’ REA supports this comment.

Removal of non-biodegradable packaging

Section 6.1

“The pre-treatment shall remove any non-biodegradable packaging prior to loading those biowastes/biodegradable materials into the digestion system” – the focus of the PAS 110 is to produce a quality biofertiliser and therefore it should not stipulate at which stage in the process the removal on non-biodegradable material occurs as long as the final product meets the quality criteria set out in the standard. As long as it meets the standard it should not matter whether it is removed at the front, middle or end of the process.

REA requests that this requirement for removal prior to digestion is removed.

Clause 10.1.3:

“Sampling for measurement of stability only (VFA & RBP) only shall be carried out before separation of whole digestate into separated fibre or sludge liquor’. In view of feedback received from members, **REA considers This should be included but amended to give the operator the option to test before or after as some facilities may apply further treatment/processing to the treated liquor or solids after separation (e.g. aeration step) and ruling this out may stifle innovative techniques. Therefore this should be amended to allow for testing before separation or after leaving it to the operator to decide which is more appropriate in their individual case. For those not separating clarification is needed that this would be from the final stage, i.e. storage tank.**

Definition of co-operatives:

REA requests that the sentence ‘whatever legal status is granted and its members by national law’ is removed from the current definition of ‘Farming horticultural /forestry co-operative’, as there isn’t a cooperative act under national law.

In other words, the new definition should be ‘Natural or legal persons who form a group under a written agreement, who exercise only agricultural, soil/field grown horticultural or forestry activities within the countries of the UK, and who as a group carry out one anaerobic digestion process at one location within the co-operative’s holdings’.

The correct interpretation of this definition can be clarified in the Biofertiliser Certification Scheme rules. We suggest that the terms and conditions of the written agreement referred to within the definition are developed and approved by the owner of the Biofertiliser Certification Scheme and the relevant certification bodies.

Suggested elements of such written agreement which could be provided within the Scheme Rules or within a standard agreement template are summarised below:

Term of the agreement:	the agreement should be for a minimum of one year to stop farmers joining the co-operative for a short period and leaving immediately after supplying feedstock. The other members of the agreement will not be able to properly evaluate the risk from the feedstock of the temporary member. Also a member may only join for a short period to give them access to
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	digestate but will not have any influence on how that digestate was produced.
Signatories to the agreement:	the signatories should include the plant operators, the land managers/farmers who are providing the feedstock and managing the digestate spreading and also the owners of any of the land that is managed by the land managers or farmers. It is important that the land owners are made aware of the risks as they may take over the management of the land soon after digestates have been applied.
Pathogen test results:	As the materials have not been through a pasteurisation step the signatories to the agreement need to be aware of the risk that they may be exposing themselves to. Test results for key pathogens should be provided to the signatories before they sign the agreement and provided along with the other results from the routine tests. Pathogen species to test for will be decided by the signatories, and are likely to be decided by the type of feedstocks being grown. There is still a requirement to test for Salmonella and E.coli.
Materials that do not arise on the co-operatives premises:	Materials that arise outside the co-operatives premises must be pasteurised, whether they are purpose grown crops, animal bedding or other non-ABP material, if such materials are to be co-digested with materials arising within the co-operatives holdings

Comments already submitted to BSI on 25th November 2013: REA's views

The following comments were already submitted to BSI by REA on 25th November 2013

Page IV Foreword: [24]

The text refers to the 2009 version of the AD Quality Protocol (ADQP), however the EA has confirmed that the publication of the new ADQP is imminent, so reference to the new ADQP should be included in the new PAS 110.

Clause 10.6:

We strongly recommend that the proposed approach of sampling over a period of three months with a minimum interval of one month between consecutive samples apply to all parameters, NOT only digestate stability.

It would be extremely unpractical and onerous for the AD operators if samples for all parameters other than stability have to be taken at a different time from the samples taken for testing digestate stability.

We strongly recommend that, as previously proposed for the RBP:

at least three samples be tested for all parameters other than RBP during validation, over a minimum period of 3 months, with a minimum interval of one month between consecutive samples. This is a change from the existing approach and that proposed in the draft PAS 110, based on which the interval between two consecutive samples is the average retention time of the plant. The new proposed approach should ensure that samples of digestate are taken sufficiently far apart in time to ensure that each sample represents a different portion of production. This is confirmed by the statistics shown in the attached spreadsheet, related to the results for key parameters from an AD plant with an average retention time of 55 days. The excel spreadsheet compares the mean and standard deviation of results from samples obtained at a monthly frequency and samples obtained every other month. The means and standard deviations of the sampling distributions suggest that there is no significant difference in the results for this plant whether it is sampled on a monthly basis or every other month.

AD operators should be able to justify alternative sampling programmes (e.g. a number of samples higher than the three minimum required or a higher time interval between two consecutive samples) to reflect potential fluctuations in the input materials.

For any clarification on this response, please contact:

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