



REA ORGANICS 2025 ANNUAL CONFERENCE

Tackling Physical Contaminants in Composting and AD processes

An Operator's Perspective

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ROOTS
RECYCLING OF ORGANICS • TECHNICAL SUPPORT

Transform Waste to Quality Products

Waste Inputs



Composting



Product Outputs

- Compost products

England, Wales & NI:

PAS 100:2018 limits for Physical contaminants >2mm; Total -

0.25%_{mass} , Plastics - **0.12%_{mass}** ,

Stones >4mm - **8%_{mass}**

PAS 100:2018

Table 3 – Minimum compost quality for general use

Item	Parameter	Method of test	Unit	
Physical contaminants				
12	Total glass, metal, plastic and any 'other' non-stone fragments > 2 mm	REAL MT PC&S ^{d)}	% mass / mass of "air-dry" sample	0.25 ^{d)} , of which 0.12 is plastic
Stones				
13a	Stones > 4 mm in grades other than "mulch"	REAL MT PC&S	% mass / mass of "air-dry" sample 10	8
13b	Stones > 4 mm in "mulch" grade			

- Compost products

Scotland:

SEPA EoW limit for Plastics is 50% of PAS 100:2018 - **0.06%_{mass}**

Additional Scheme Rules Scotland

SEPA's End of Waste Guidance for Compost

Date	Parameter	Limit
From 1 December 2018	Plastic	0.08% (66% of current PAS100)
From 1 December 2019	Plastic	0.06% (50% of current PAS100)



Transform Waste to Quality Products

Waste Inputs



AD



Product Outputs

- Digestate products
England, Wales & NI:
PAS 110:2014 limits for
Physical contaminants and
stones depends on TN content

Table 3 – Minimum digestate testing and quality requirements after validation (

Total nitrogen (N)	kg/t	Less than 1	1 to 1.9	2 to 2.9	3 to 3.9	4 to 4.9	5 to 5.9
Total stones	kg/t	3.2	6.4	9.6	12.8	16	19.2
Total physical contaminants (excluding stones)	kg/t	0.04	0.07	0.11	0.14	0.18	0.22
No "sharps" (see 3.66 and 6.1)							

PAS 110:2014



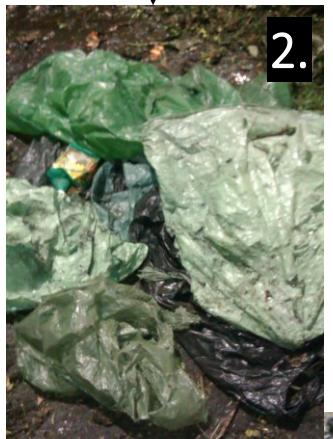
- Digestate products
Scotland:
SEPA EoW limits for Plastics – **8%_{mass}**
of PAS 110:2014 limit
Additional Scheme Rules Scotland

Physical Contaminants – Control Points in Composting Operations



Food / Green waste

1.



2.

Removed Contaminants



3.

Shredder



4.

Waste Mix



5.

Composting material

Composting system



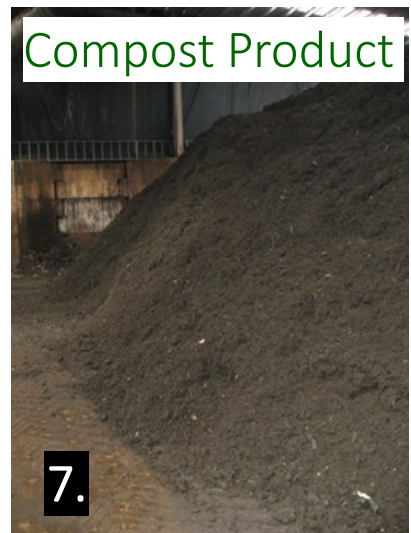
6.

Screening process



8.

Compost Oversize



7.

Compost Product

Clean Oversize

Picking station

PAS 100 Physical Contaminants Testing

PHYSICAL CONTAMINANTS

Method Reference: REAL MT PC&S v1¹

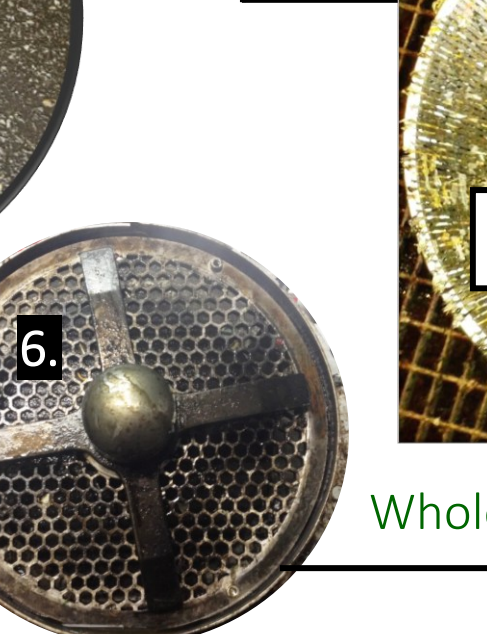
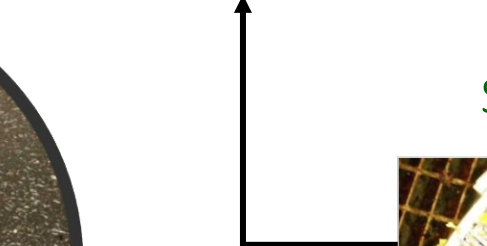
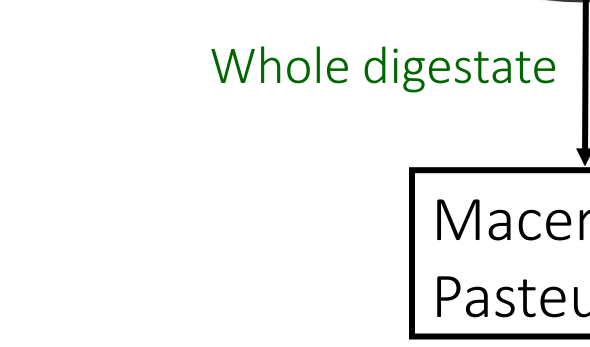
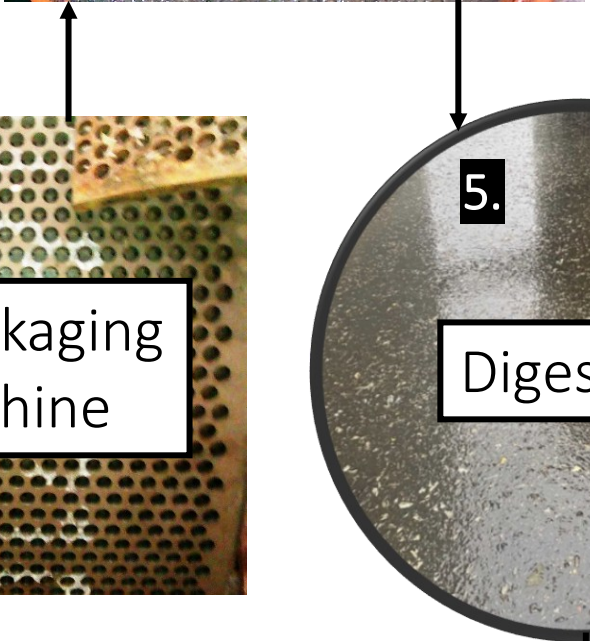
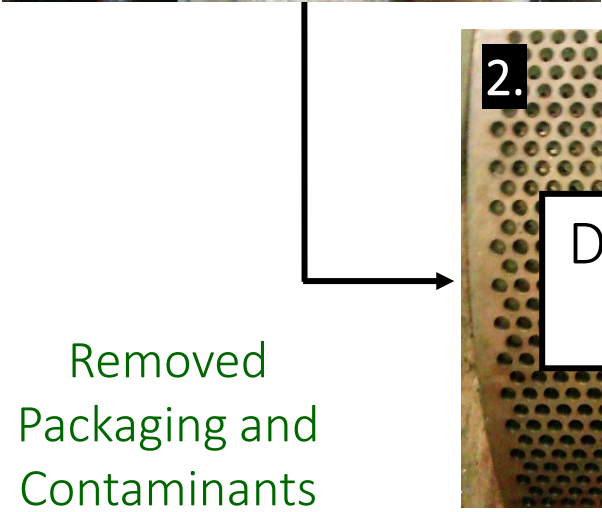
Sieve Apertures ¹	Glass	Metal	Plastic ²	Other ³	Description	Total ⁴	Of which Sharps ⁵	Stones ⁶
mm	g	g	g	g		g	g	g
31.5	0.00	0.00	0.00	0.00	Pending	0.00	0.00	0.00
16.0	0.00	0.00	0.00	0.00	Pending	0.00	0.00	0.00
8.0	0.57	0.00	0.00	0.00	Pending	0.57	0.00	12.71
4.0	0.35	0.00	0.00	0.01	Fibre	0.36	0.10	5.72
2.0	0.16	0.00	0.03	0.01	Polystyrene	0.20	0.00	ND
1.0	ND	ND	ND	ND	N/A	0.00	ND	ND
Pan	ND	ND	ND	ND	N/A	0.00	ND	ND
% of total sample > 2 mm	0.26	0.00	0.01	0.00		0.28	0.02	N/A
% of total sample > 4 mm	N/A	N/A	N/A	N/A		N/A	N/A	4.52
PAS 100 upper limit for "mulch"			0.12			0.25	R	10.00
Pass or Fail ²			Pass			Fail	R	Pass
PAS 100 upper limit for other than "mulch"			0.12			0.25	R	8.00
Pass or Fail ²			Pass			Fail	R	Pass

50% x 0.12
= 0.06 kg/t

Contaminants Key - Other²

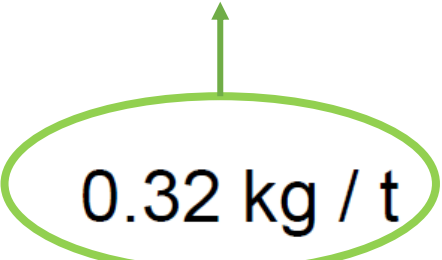
A = Card/Paper B = Textile/Fibre/Fabric C = String/Twine/Rope D = Rubber E = Matting

Physical Contaminants – Control Points in Anaerobic Digestion Operations



PAS 110 Physical Contaminants Testing


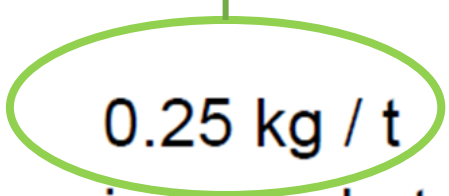
Physical contaminants in WD / SL / SF on a fresh weight basis

Parameter	Units	Result	Upper Limit
Plastics > 2mm	kg / t	Zero	$8\% \times 0.32 = 0.0256 \text{ kg/t}$ 
Glass > 2mm	kg / t	Zero	
Metals > 2mm	kg / t	Zero	
Other > 2mm	kg / t	Zero	
Total > 2mm	kg / t	Zero	
of which Sharps:	kg / t	Zero	
Stones > 5mm	kg / t	Zero	Zero in sample test 28.8 kg / t

Zero - No visible contaminants were found in the sample as submitted

Removal of Physical Contaminants - Digestate

Physical contaminants in **WD / SL / SF** on a fresh weight basis

Parameter	Units	Result	Upper Limit
Plastics > 2mm	kg / t	0.079 	$8\% \times 0.25 = 0.08 \text{ kg/t}$  0.25 kg / t
Glass > 2mm	kg / t	Zero	
Metals > 2mm	kg / t	Zero	
Other > 2mm	kg / t	Zero	
Total > 2mm	kg / t	0.079	
of which Sharps:	kg / t	Zero	Zero in sample tested
Stones > 5mm	kg / t	Zero	22.4 kg / t

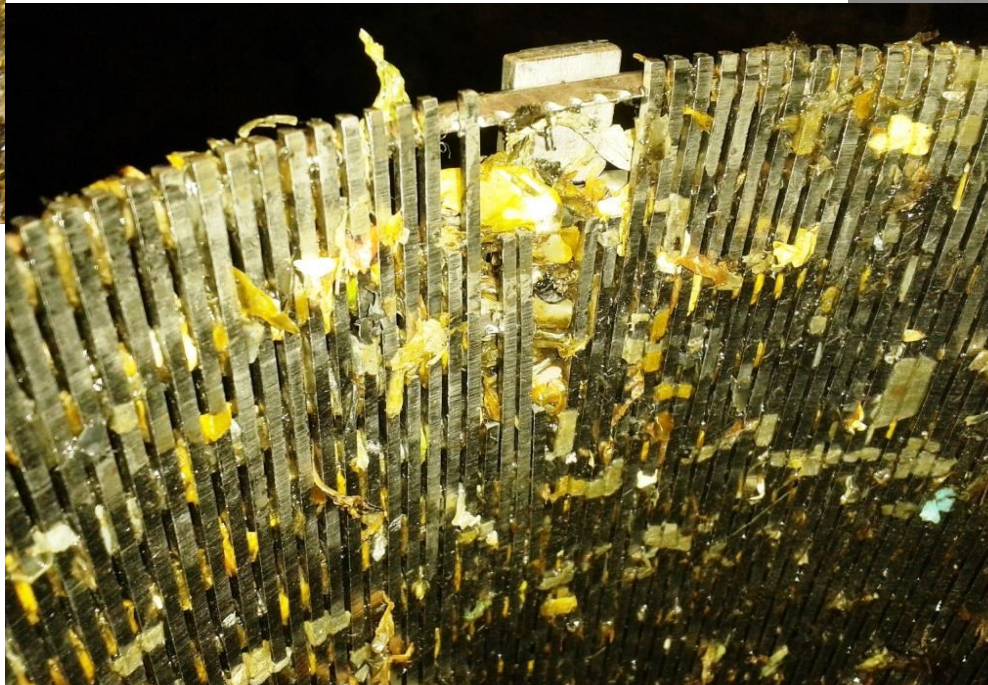
Zero - No visible contaminants were found in the sample as submitted

Removal of Physical Contaminants - Digestate



Filter screw press with
1mm screen

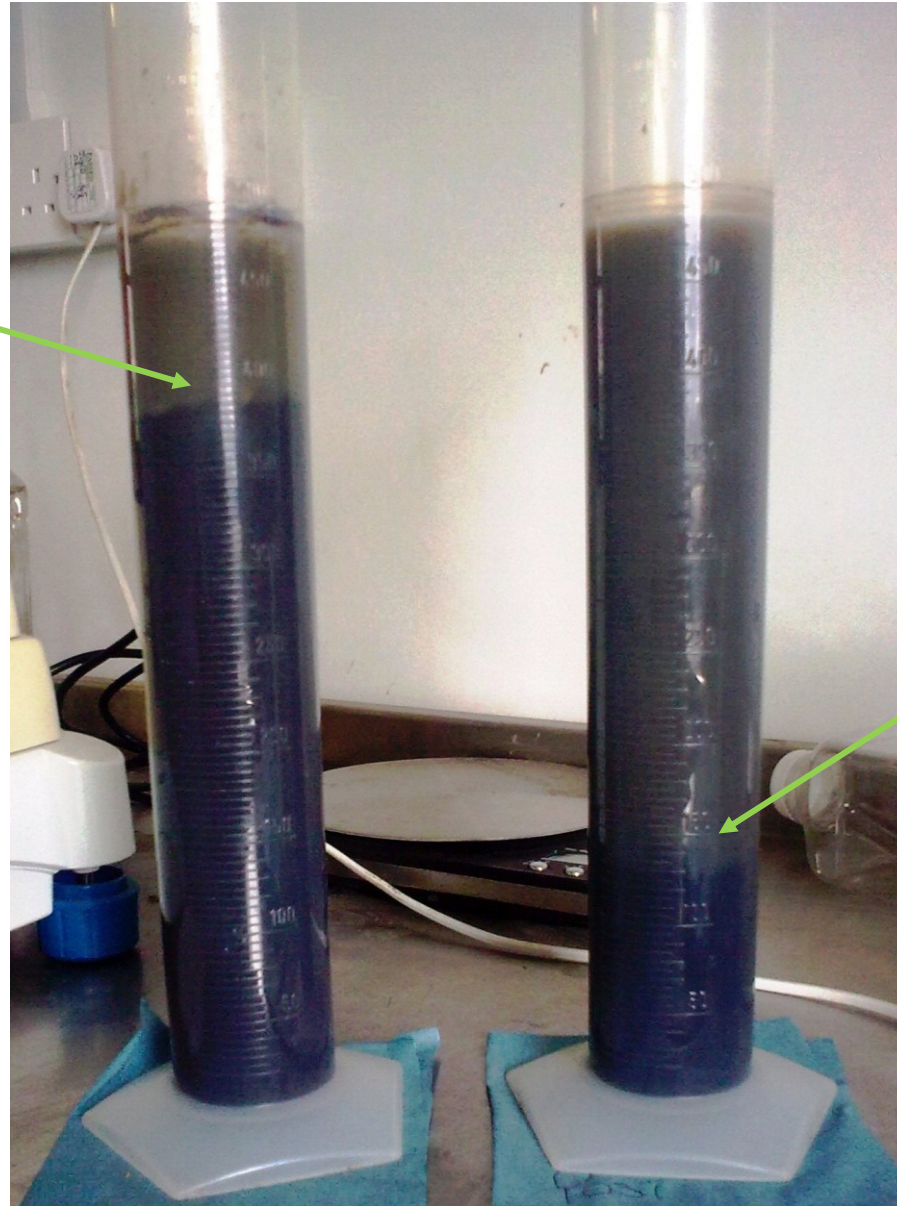
Screen damage



Removal of Physical Contaminants - Digestate

Whole digestate
before separation:
Settled solids

Average DM 7.60%



Separated liquid
fraction after
separation:
Settled solids

Average DM 7.25%

SL = 98-99% of WD