

Presentation to VT Universal Recycling Stakeholder Group

Food Waste Depackagers



Principles of material separation

- Material characteristics = “code”
 - Size, weight, density, hardness, magnetism, electrical conductivity, light refraction
- Machine action = “switch”
 - Machine identifies code and takes action, active or passive
 - Active – optical sorting of colored glass
 - Passive – drum mesh on trommel screen
- Metrics
 - Recovery % - percent recovered vs. rejected
 - Purity % - percent desired material in recovered stream

Food waste depackagers

- Developed in Europe in 1990s in response to BSE crisis which prevented food wastes going to ruminants
- First machines based on rendering technologies
- Shredding/crushing contaminated recovered food with inorganics/inerts
- Newer machines can separate with less force
- Machines can use multiple codes and switches, but usually:
 - Hardness (resistance to force) = code
 - Pressure = switch

Major companies in depack space

- Scott Equipment Co. (New Prague MN)
 - Makes: Turbo-Separator, THOR
 - Users: AgChoice (NJ), E. L. Harvey (MA)
- Ecoverse (Avon OH)
 - Imports Cesaro Tiger from Italy
 - Users: St. Louis Composting & Midwest Organics (MO)
 - Imports Doppstadt DSP205 from Germany
 - Users: two pending in U.S.
- Doda (St James MN)
 - Imports Bioseparator from Italy
 - Users: A-1 Organics (CO), Quantum Biopower (CT)

Scott Turbo-Separator - <https://www.turborecycling.com>

- Horizontal shaft with paddles
- Rotating speed = 400 rpm
- Packaging usually separated in first 20% of machine
 - Packaging carried along top of paddles to discharge
 - Recovered food drops down
- Does not use water but AD feedstock prep adds water to make slurry
- Capacities 2 – 40 tons/hour
- Recovery ~98%, purity ~99%
- <https://www.youtube.com/watch?v=pUX4lsbJne8>

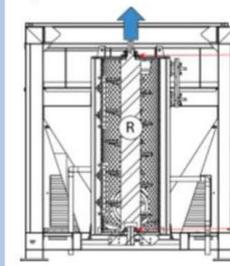


Scott Turbo Separator #01-057

16x96 Stainless Steel

Ecoverse Tiger - <https://www.ecoverse.net/tiger-depack/>

- Unit has 8 cy feed hopper with counterrotating screw augers that start depackaging
- Separation of food with vertical mill rotating at 950 rpm, pushes food through punch-plate screen
- Can be run dry or wet (uses about 300 gal water/ton throughput)
- Recovery ~ 96-99%, purity ~ 99.5%
- Dry recovery - <https://www.youtube.com/watch?v=Mxu21iNBGY>
- Wet recovery - <https://www.youtube.com/watch?v=vXaXdgP1eaw>



Doda Bioseparator - <https://www.dodausa.com/equipment/bio-separator/>

- Hopper uses serrated edge screw conveyors to open packaging
- Vertical mill pushes waste through punch-plate screen
- Recovery & purity similar to others
- https://www.youtube.com/watch?v=a_Z2E3omhw



Summary

- Technologies available to pre-process food wastes prior to composting or AD
- Costs – in the \$400K - \$600K range
- While they can handle co-mingled food wastes, they tend to work better on multiples of same kind of packaging
- Higher speed machines can fragment hard plastics and some metal, transferring to recovered product
- No data on microplastics formation or transport

A pair of weathered, brown hands is shown from a top-down perspective, cupping a small, vibrant green seedling with four leaves. The seedling is growing out of a mound of dark, rich soil. The background is a dark, textured surface, possibly more soil or a dark fabric, which makes the hands and the plant stand out. The lighting is soft, highlighting the texture of the skin and the freshness of the plant.

Questions?

Craig Coker
Coker Composting & Consulting
(540) 874-5168
ccoker@cokercompost.com
www.cokercompost.com

