

Appendix 2

Wasteology Company Brochure

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TURNING WASTE INTO WORTH



THE WASTEOLGY®
IN-VESSEL COMPOSTING SYSTEM



*A proven, cost-effective, modular and flexible in-vessel
composting system that conforms to the DEFRA rules
relating to the handling of bio-degradeable waste*





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Managing Director,
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Paton & Associates Ltd



Ted Clover,
Clover Planning



UK Sales

☎ 07966 432011

Benefits of the Wasteology® System

This is a proven in-vessel composting system that meets the legislative requirements of DEFRA.

With an overall height below 4.5m (an important consideration when obtaining planning permission).

Benefits

- Simple, low-cost, reliable and solidly constructed.
- Galvanised metalwear.
- Patented RetractaRoof® meets all Health and Safety issues, keeps bio-aerosols and circulating air in and vermin and scavengers out.
- The fully retractable roof totally removes the problem of headroom for loading and unloading when using trucks, high-tip trailers or loading shovels.
- Steam naturally vents away as the roof opens speeding up visibility within the clamp.
- Safety rails extend up from the tops of the walls for operator safety.
- The roof fabric is manufactured from a unique formulated PVC coated material that has been specifically developed by Scantarp Ab, a leading Scandinavian coated fabrics company. This fabric is designed to cope with all the hostile conditions encountered during the composting process. Rolls of this fabric are converted into RetractaRoof® covers at our premises.
- Based on the Alfabloc Instant Walling System and a standard concrete pad.
- Three operators can handle up to 40,000 tonnes per year.
- High standards of manufacture are obtained.
- All steelwork is manufactured in our workshops, maintaining high standards of quality.
- Developed in conjunction with Donarbon Ltd, a company respected for their integrity within the recycling industry. Their Cambridgeshire site is the first in the UK to be DEFRA licensed (UK regulations).

Other services offered by our associate consultants Ian Paton of Paton and Associates Ltd and Edmund Clover of Clover Planning:

Complete waste management, site planning and co-ordinating.

Drawing up plans and submitting to the relevant authorities.

Negotiating with relevant authorities on behalf of clients.



Reliable, even in hostile conditions!

The scale of the waste problem

The volume of green waste is increasing 3% per annum. Each year landfill tax increases £3.00 per tonne and will continue to do so until it reaches £35.00 per tonne. Gate fees for composting are more and more competitive so we save considerable amounts of money by composting and not sending it to landfill. This is aside from legislation and the many other benefits of handling waste in this way.”

MARK SHELTON,
WASTE REDUCTION MANAGEMENT
& RECYCLING MANAGER,
CAMBRIDGESHIRE COUNTY COUNCIL

“It is estimated that 100 million tonnes of waste is being produced in the UK each year and 50% of this is organic so we needed to look at providing a practical way to cope with such high volumes.”

DAVID McVEIGH,
MANAGING DIRECTOR,
COPPERFIELD ENGINEERING LTD.

Practical system requirements

“At the time of choosing a system we looked for one that was affordable at UK gate fees and one that could handle a wide range of bio-degradable

waste. Potentially we had a huge amount of tonnage to handle each week so we felt that the simpler the system is the less likely it is to go wrong which, in turn, minimises downtime. This system has a good throughput, is definitely cost effective and requires minimum maintenance.”

SARAH CLOVER,
PLANNING MANAGER,
DONARBON LTD



Left: A site of twelve clamps capable of handling 40,000 tonnes/annum

The sustainable solution

"We decided that the clamp system was the way to go as it has so many advantages over other methods on today's market, the most notable being low cost and simplicity."

DAVID McVEIGH,
MANAGING DIRECTOR,
COPPERFIELD ENGINEERING LTD.



Loader begins emptying clamp

Within the enclosed clamp a complete pathogen kill is brought about by allowing the material to heat up to a temperature of 60°C or over for a minimum of 2 days and then repeated in a second clamp 7 days later. This complies with the Animal By-Products

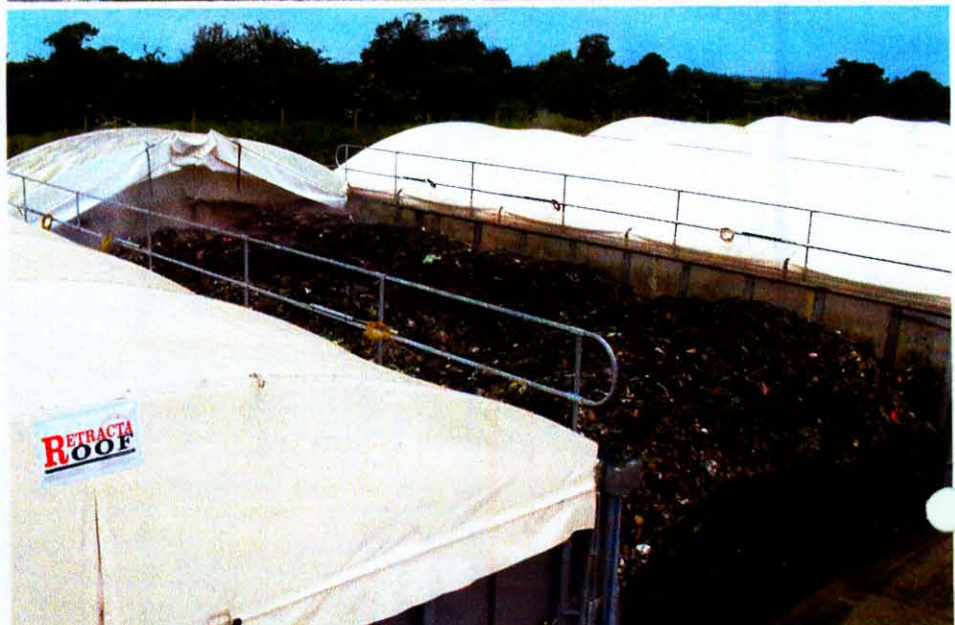
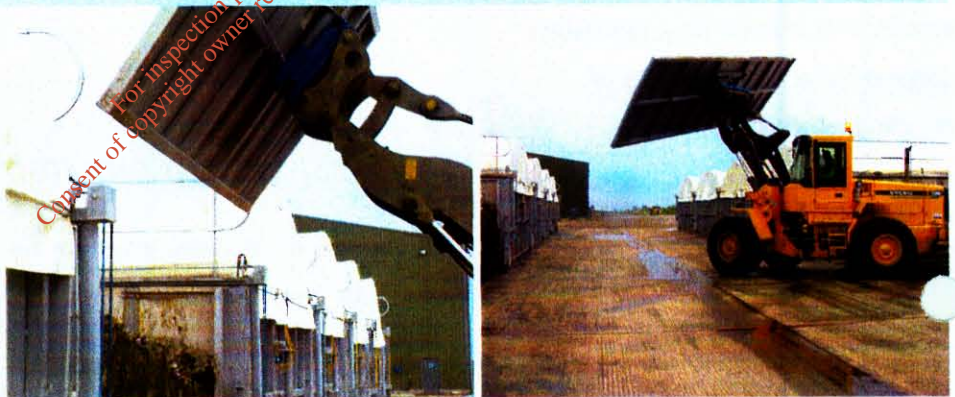
Regulations (2003).

Air is evenly distributed throughout the material in the clamp feeding the micro-organisms with oxygen, allowing aerobic activity and creating heat. The ventilation air is circulated within the system containing any odours from the composting process.

The Wasteology® System

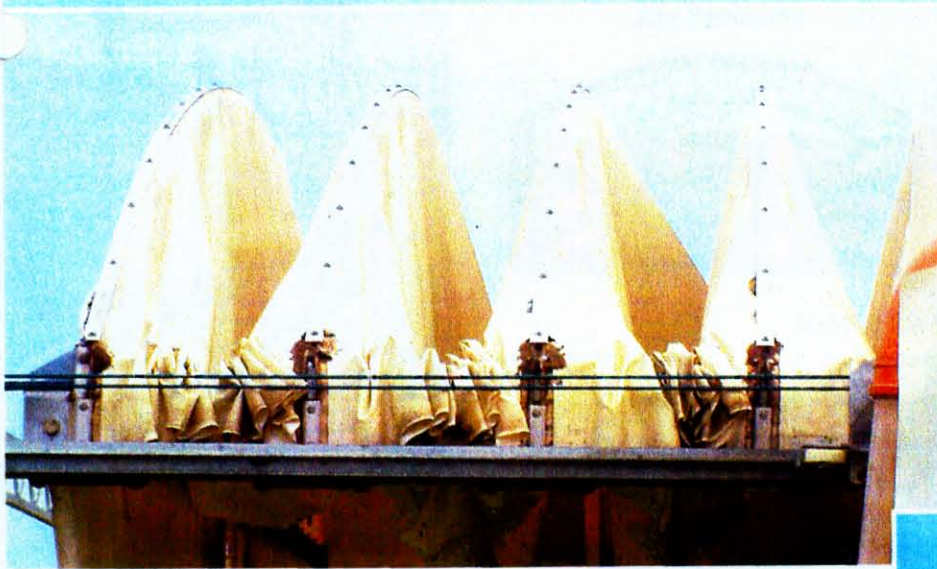
The standard structure containing the composting material, measures 15m x 8m x 2.5m. This is an affordable building with extremely low running costs and is capable of holding 180 tonnes of bio-degradable waste matter. The weight will vary depending on the bulk density of the material to be composted.

No special civil engineering is required as the building is based on the Alfabloc Instant Walling System and a standard concrete pad.



Above Right: Loader with special attachment removes full width door

Right: Roof retracted completely exposing compost



Roof retracts onto extension rails.

“With today’s loaders and trucks it is important to have unlimited headroom for loading and unloading, so we developed our patented RetractableRoof® which withdraws to the rear of the building, completely clearing the composting area. This can be done either manually or, if preferred, by electric motor. Closing and opening takes about one minute. The steam from the composted material escapes quickly once the roof opens.

It is very important to keep the material free from excess moisture to minimise leachate. The naturally occurring leachate is collected and used to dampen the incoming material at the shredding process.”

The RetractableRoof® cover is manufactured from a unique formulated PVC coated material specifically developed in Scandinavia. The fabric is designed to cope with all the hostile conditions encountered during the composting process. The RetractableRoof® allows for very efficient filling of the clamp.



Right: Effective filling of the clamp



Above: Manual roof mechanism
Above inset: Motorised roof mechanism

“It is very important to keep the void between the material to be composted and the roof to a minimum. This allows better control of air circulation and better profiles of temperature. The whole point of the exercise is to obtain an effective pathogen kill. The air is circulated within the clamp and this contains any smells during the composting process.”

DAVID McVEIGH



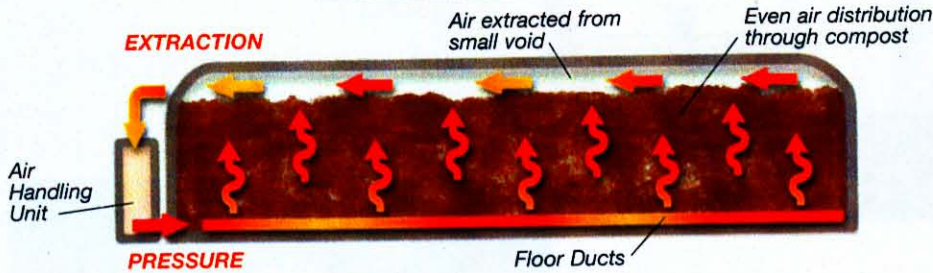
Left: Steam is vented from the compost

Pathogen kill

Air is required for aerobic activity within the waste. This is introduced and evenly distributed throughout the material by ground level ducting. The patented ducts are designed so that they stay free of blockage either from the material itself or leachate.



RE-CIRCULATORY AIR SYSTEM



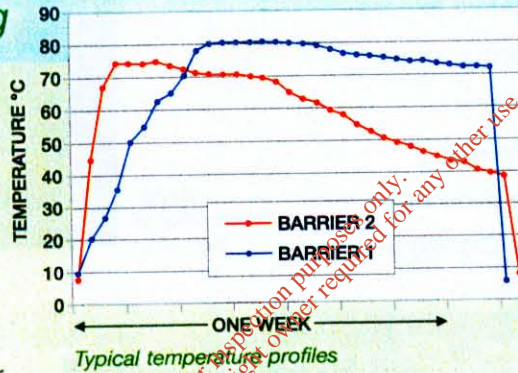
Quiet running fan units

Ventilation system

Temperature monitoring

Six or seven stainless steel probes are inserted throughout the material in the clamp. The measured temperatures are transmitted using wireless technology to a PC at the site office. Here temperature profiles are created.

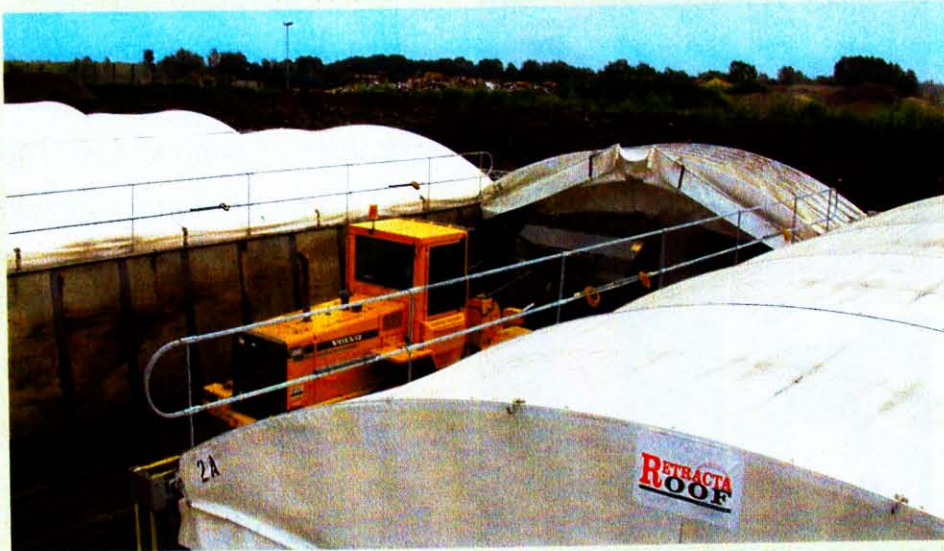
To ensure that no cold spots occur, the composted material, after seven days, is unloaded from one clamp to another. This movement thoroughly mixes the compost and, after a further seven days, it is ready for unloading and taken to the maturation area.



Typical temperature profiles



Temperature probe with wireless transmitter



Maturing compost

Left: Uninhibited loading and unloading

Expansion of the Wasteology® System

A major benefit is that the system is modular. Increasing capacity is simply a matter of adding units to an existing Alfabloc wall.

Health and safety

All regulations for a structure of this type have been met. A safety rail around the top of the walls ensures operator safety.

FREQUENTLY ASKED QUESTIONS

THE IN-VESSEL COMPOSTING PROCESS

A number of factors are important in controlling the composting process and the time that the process takes. These factors include temperature, moisture, oxygen, particle size, the carbon-to-nitrogen ratio of the waste and the degree of mixing or turning involved. In general, the more actively these factors are controlled, the faster the process.

1. Is the Wasteology system ABPR compliant?

Yes. Our Wasteology in-vessel system was designed from the start to meet current UK and EU rules. Operational procedures have to be strictly carried out and maintained.

2. Has the Wasteology system achieved the ABPR licence?

To date our clients have achieved 100% record in obtaining the necessary validation, under UK Regulations and using the two Barrier system. Please note proper procedures have to be put in place and maintained to satisfy SVS regulations. We are pleased to recommend the services of our independent consultant Mr Ian Paton who has considerable experience and knowledge in this field.

3. Can potential customers view an approved site?

We are happy to arrange a visit to an approved site in the UK by appointment.

4. Can we help with obtaining licences and relevant permissions?

We prefer to recommend our associated consultants who have many years experience with in the waste industry.

5. Can Wasteology organise a full turn-key service?

We are in a position to offer a full service, from obtaining planning, Waste Management Licence, HACCP's and SVS approval, through to construction and full commissioning.

6. Does the Wasteology system carry any warranties?

The system comes with a one year parts warranty. The PVC covers have a five year warranty which decreases in value with time.

7. What are the dimensions of each vessel?

Each clamp is 8 metres wide by 15 metres long by 2.5 metres high, to the walls.

8. How much does each vessel hold?

The cubic capacity of the vessel is approximately 330 cubic metres. The typical weight approx 150-170 tonnes depending on the bulk density and content of the material composted.

9. How long does the composting process take using the Wasteology system?

This is very much dependant on the final use of the compost. For example, for agricultural use, two weeks in-vessel composting followed by six to eight weeks maturation will be sufficient. It should also be noted that the length of time within the in-vessel system is dictated by the requirements of the ABPR. Under a two Barrier system and using the time/temperature criteria of 60°C for 2 days in both barriers, the material is shred and put into a vessel for one week, Barrier 1, and then transferred into a second vessel for a further week, Barrier 2. The material is then removed from barrier 2 and is then matured on a maturation pad for a further six to eight weeks.

10. Does composting cause odours or attract rodents?

The Wasteology system does not attract rodents or birds as the waste is received and pre-processed in a building and then composted for approximately two weeks in fully enclosed clamps. It should be noted that under the ABPR rodents and birds must be excluded from the waste and site. The SVS and Trading Standard Officers regularly inspect sites to ensure this occurs. Any waste

management facility, including a composting site, has the potential to generate offensive odours usually due to the feedstock or inadequate aeration or excessive moisture. Close monitoring of these factors can usually help to minimize odours. Facilities can employ abatement systems, such as bio-filters, to treat occasional odours. Trials have been carried out where the oxygen levels have been monitored within the clamps in at least three different points around the clamp, all at the waste surface. This was carried out in both barriers and averaged 16%, more than sufficient for the biological process. This results in temperatures of 65 to 70°C being achieved in both barriers.

11. Can I compost in the winter?

Yes. We have not had any problems with Wasteology in-vessel system. Providing the waste composition is correct then the micro-biological system will produce temperatures in excess of 60°C as required by the ABPR.

AIR SYSTEM

12. Do the air ducts stay clean?

Yes - our top priority was to design a system that stayed clean all of the time in all conditions. The patented system has proven itself successful in daily use for the past two years.

13. Where and how are the air ducts situated?

No special concrete form work or ducting needs to be carried out as our air system bolts on to the top of the concrete pad.

14. Do the air ducts get damaged by loading shovels?

No, the air ducts are of a design that can withstand the weight of a loading shovel. The air ducts are also designed to allow the loading shovel bucket to glide over the top.

15. What size are the fans units for the aeration system?

The fans that are used have a 4kw motor drawing approx. 7.11 amps, only one is needed for each vessel.

WATER SYSTEM

16. Is the rain water kept separate?

Yes, the rain water that comes off the roof is collected in the gutter either side of the roof and then directed either to a tank or possibly into the clean water drainage system. Several clients are using this water as wash-down water to clean the site on a daily basis as part of their ABPR approval scheme.

17. Is all the leachate re-used?

The leachate that is produced from the vessels is directed into a sump and then pumped to a holding tank. From the holding tank the leachate can then be applied to the incoming material after it has been shred. In most cases all the leachate is re-used.

FINISHED COMPOST

18. What happens to the finished compost?

Applications are normally agriculture, horticulture and replacement for peat compost. A very good source of information on typical quality of the compost and also case studies of its use can be found at www.wrap.org.uk.

It should be noted that before using the compost, checks should be made to ensure that it complies with any requirements or restrictions that the various environmental agencies may apply. For example, in Scotland compost can be used unrestrictedly providing it passes PAS 100 or similar specifications. When using the compost any restrictions or conditions required by law, such as the ABPR, have to be adhered to.

May we now invite you to load the CD and see the Wasteology® System in action.



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