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Rocket
composter



ROCKET COMPOSTER

These briefing papers describe sustainability actions at the University of Bradford as part of the development of our Ecovercity programme.

These papers are developed through The Sustainable Education Directorate together with the University staff and students featured inside, and are part of our commitment to improving communication around Ecovercity.

Comments and feedback are welcome and should be sent to: ecoversity@bradford.ac.uk

The University of Bradford has its very own Rocket

The University currently produces large quantities of organic waste in terms of food waste from the catering outlets on Campus and in-house catering. This is through the 1,000s of meals that are made every day at the various outlets around our sites. The majority of this waste, up until now, has been collected and sent to landfill as residual waste. The food waste collected in the kitchen of the main restaurant in the Richmond Building has previously been sent for composting locally. Not only is this waste unnecessarily filling up landfill sites it is costing the University through transport and disposal costs.

During 2008 Ecoversity looked into ways in which we could treat our food waste on site. The solution has been the purchasing of a Rocket! This is not a way to send our waste to the moon but an 'in-vessel compostor' which is located in the loading bay behind the JB Priestley Library.

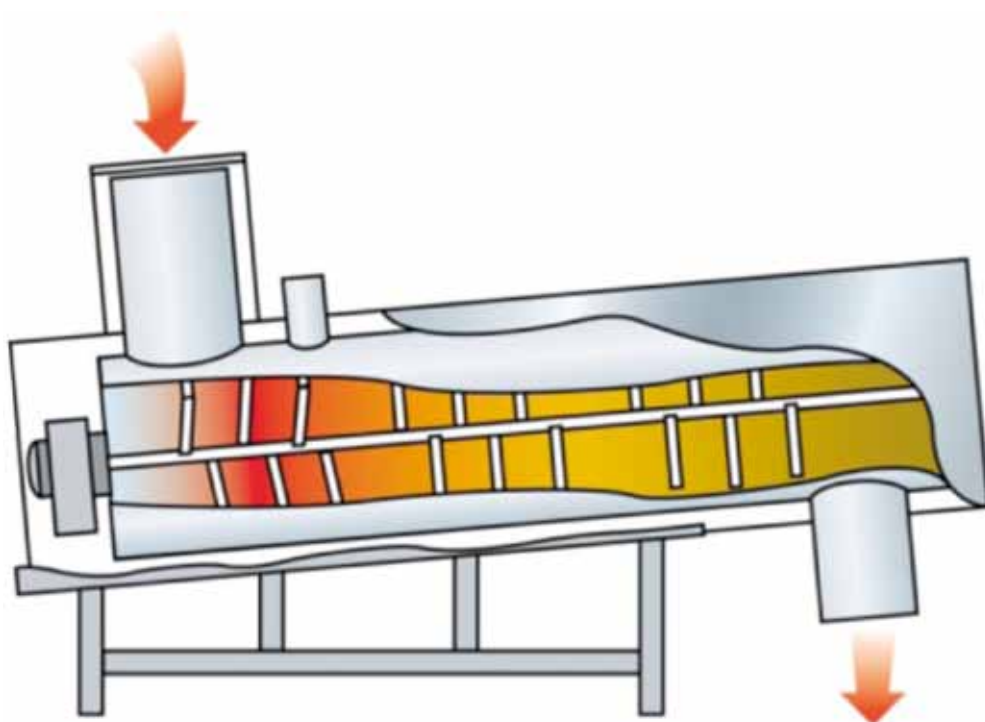
Having a Rocket composter means that the University is able to turn food and garden waste from the estate grounds into compost within fourteen days. The Rocket's careful design means that it is possible to compost a relatively large amount of waste despite its compact size. The aim is to compost up to 1,400 litres of organic waste per week. Using the Rocket it is also possible to compost meat and fish alongside other food waste.

How does the Rocket work?

The Rocket is a continual process system, designed to be fed with waste as frequently as possible – ideally daily. Food and organic waste is placed into the hopper on the top of the machine with an equal quantity of "woody" material. Wood chip is ideal as it is high in Carbon and has the appropriate structure to help the process. At Bradford we are looking at using the used disposable wooden cutlery as our woody material in the first instance.

The process from then on is automated. As the blades of the internal shaft turn they aerate the material, moving it along the body of the machine providing extra loading space at the input end of the machine and pushing finished material from the exit of the machine. The material is in the Rocket for around 14 days in total.

The Rocket forms a controlled environment in which harmless composting microbes thrive. The addition of fresh waste into the warm, moist and well ventilated environment of the Rocket, enables the microbes to multiply, eat and grow. This process generates temperatures up to 90°C. This heat is contained through high density insulation and keeps the environment warm and the microbes working.



Creating compost

Compost is the result of the biological action of micro-organisms on organic materials i.e. food, plants, animals and wood. Once the contents of the Rocket reach more than 60°C, and this temperature is retained for two days it is possible to kill off all pathogens such as Ecoli and Salmonella as well as weeds, seeds and slugs. This is why it is possible to put organic waste such as meat and fish into

the Rocket and still create safe compost. Since the Rocket is an entirely enclosed system, all possible access by pests such as rats and flies is prevented.

There are four stages of micro-organism activity in creating compost, which are characterised by different temperature ranges, these are:

Stage	Days	Temperature	What's happening
1 - Mesophilic	1-2	Ambient	Temperatures are elevated as the micro-organism food chain gets to work
2 - Thermophilic	4-5	45°C – 90°C	Energy is liberated through the food chain process. At these higher temperatures specialist flora of bacteria and fungi take over. Organic degradation is rapid and pathogens and weeds are destroyed
3 - Cooling	5-6	30°C- 40°C	As the thermophilic activity declines temperatures decrease and another series of organisms grow
4 - Maturation	3-4	Ambient	A fourth series of organisms now take over and enable the nitrifying process to begin: Ammonia –Nitrites – Nitrates which are essential for plant growth

The resulting compost is a brown and crumbly, soil like substance which contains all the elements and trace elements necessary for plant growth. The structure of the compost is ideal for plant root generation and has excellent moisture and Oxygen retaining properties. The compost contains many beneficial micro-organisms that actively support plant health, minimising the need for fertilizers, insecticides and fungicides.

Composting at Bradford

There are a number of steps involved in creating compost at the University. These are:

1. Collection of food waste from catering outlets – front and back of house.
2. Collection of other organic waste from the Estate such as tree prunings, grass cuttings.
3. The waste is shredded and mixed with woody material.
4. Mixed material added into the Rocket on a daily basis.
5. Material will be in the Rocket for 14 days while it is turned into compost.
6. Resulting compost is emptied and will be used on University grounds.

Once the system and the Rocket is working well the aim is to expand the composting system to include the collection of compostable waste from offices and other areas of the University.

References:

Accelerated Compost Ltd www.quickcompost.co.uk

Further Information

For further information or communication on Ecovercity or this briefing paper email ecoversity@bradford.ac.uk

For more detail on Ecovercity:
www.bradford.ac.uk/ecoversity