

# DISPOSAL DESIGN

FOODSERVICE WASTE MANAGEMENT APPLIANCES HAVE TO GO THROUGH CONSIDERABLE RESEARCH AND DEVELOPMENT PROCESSES BEFORE THEY REACH THE MARKET. THEREFORE WE INVESTIGATE HOW MANUFACTURERS IN THIS SECTOR CONSIDER A VARIETY OF RELEVANT FACTORS DURING THAT PERIOD.

**I**t is a meticulous process to bring commercial food waste management equipment to market, involving a detailed research and development journey. Not only does the appliance need to perform its intended function, it also has to do so in an unobtrusive way, whether that is through odour prevention or taking into account space limitations in many professional kitchens.

Therefore we asked major manufacturers in this sector to detail the thorough considerations they have to take into account when creating one of these units.

Mechline Developments is one major name in this arena. Its Waste<sub>2</sub>O food waste bio-digester is a compact, lightweight and scalable solution for end-of-life food. The supplier has ensured that all sizes of kitchens can be catered for, as the unit can be stripped down to 760mm minimum width, which allows installation access where larger machines cannot gain access, and has four height adjustable legs.

Marketing manager Kristian Roberts detailed: "As with all systems, the size of unit dictates how much food waste can be processed. Each Waste<sub>2</sub>O unit can digest up to 180kg over a 24 hour period, any more and multiple units are used to scale-up the system. But the potential for effective smaller units would require operators to reduce their amount of food waste (and give them even more incentive to do so)."

Waste<sub>2</sub>O uses the process of aerobic microbial activity to convert all soft end-of-life food waste into waste water that is safely sent

straight to the drain, using existing services. As this should remove the requirement for dealing with solid food waste and storing it for collection, accordingly it should reduce odours and the associated vermin and hygiene problems. The machine itself has a sealable lid to contain all odours.

In terms of capacity, Mechline states there are no limits to the amount of Waste<sub>2</sub>O modules that can be installed. According to Roberts: "Waste<sub>2</sub>O is a truly scalable solution for food waste issues. Much like the human digestive system, the appliance gradually processes the food throughout the day. Operators should aim to add 1x 20-litre bucket (approx. 22.5kg) of food waste every 3 hours to achieve maximum performance, but Mechline can prepare a loading guide based on individual sites operating hours as required."

The manufacturer has considered noise too. With the unit being constructed from modern durable materials, including moulded MPDE, which should provide good insulation properties, the machine is designed to be quiet. Emissions are said to not exceed 70dB at workstation position.

Consideration has gone into energy efficiency, with the appliance running on a normal 10A single phase electrical supply. The waste is also pumped using an on-board drain pump. Mechline advised that the Waste<sub>2</sub>O uses the same services as a domestic washing machine.

The supplier has thought about ease of use, as operators should only have to open the appliance lid and pour the end-of-life food waste through the hatch and close the lid.



The Waste<sub>2</sub>O is designed to do the rest. Microorganisms then digest the food waste, converting it into waste water. As the water is sent directly to the drain, this should leave no solid waste to manage.

The unit helps ecology and the circular economy, as Roberts explained: "This water is then captured and reclaimed by local waste water treatment facilities, as it is transported through the sewage network to the sewage treatment plants. Here the waste can be extracted and put into anaerobic digestion (AD) plants. Through this process the need for heavy carbon-producing collection lorries is removed. This is the best solution in locations where access by collection lorries is an issue, for example at a restaurant on top of a mountain, a hotel in a rural location or secure locations where access is restricted."

And on the subject of maintenance, he concluded: "Waste<sub>2</sub>O machines have been designed using high quality, heavy duty parts and

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Mechline recommended that waste is gradually added to its Waste<sub>2</sub>O anaerobic digester throughout the day.

components, with a goal of keeping the service calls to a minimum. However, when needed, the modular design allows for easy replacement of parts and most electronic parts are front-serviceable.”

Another company leading the way on food waste management equipment is IMC. With many in the industry citing small kitchens as a stumbling block for this type of appliances, the manufacturer’s engineering manager Eddy Plumb analysed: “It’s true that many kitchens lack space, but we offer a wide range of food waste disposers that can be used where space is limited. These range from basic, under sink units through to systems which allow food waste to be processed in the kitchen, before being piped to remote, industrial-sized, auto-fed units. Other options include trough and integrated worktop waste disposers.

“A great example of how this can work is the Autofeed waste system we designed and installed for the 23 restaurants of the Metrocentre’s Qube leisure and dining area. The unit is sited in a purpose-built room to provide retailers with the ability to process food waste responsibly, and not simply dispose of it in general waste bins.”

Dave Dixon, environmental services manager of the Newcastle shopping centre’s operator, Intu Metrocentre, commented: “Since its installation,



the IMC Autofeed waste system has processed 356tonnes of food waste and reduced the weight of the waste by 198tonnes. All food outlets are issued with 23-litre food caddies which are collected and replaced daily at the back door. All the caddies are weighed, and the waste is processed through the IMC Autofeed waste system where the food is disposed of into a sealed compactor and sent off for anaerobic digestion.”

Avoiding the production of bad smells was a consideration for IMC’s research and development team. Plumb detailed: “The key to containing odours is to process the waste quickly. All of our food waste disposers do exactly that to remove unpleasant smells from the kitchen environment. Our Wastestation models also feature a self-cleaning system which prevents the build-up of food waste – which causes the unpleasant odour – within the machine itself.”

All IMC food waste disposers are designed to be easy to use, with three straightforward functions: on, off and clean. “This facilitates quick operator training, and efficient, clean and safe

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One of the IMC Autofeed waste systems designed and installed for the 23 restaurants of the Metrocentre’s Qube leisure and dining area.

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operation,” according to Plumb.

The firm’s auto-fed range of Wastestation food waste disposers can hold up to 200litres of food waste, which can then be processed in a single batch, either in the same room, or up to 55metres away. Simpler systems process the food waste immediately as it enters the macerator.

But Plumb acknowledged: “Macerating food waste does produce a certain level of noise. However, we do our best to reduce it through the careful design of our hoppers. Our top of the range models include fully-sealed lids to reduce noise levels further.”

IMC’s In Vessel Composter (IVC) range, when used in conjunction with its Wastestation food waste disposer, can transform food waste into compost. Plumb reported: “This combination has proved its worth in large universities, golf complexes and prison services across the world.”

And for ongoing operation he revealed: “We provide maintenance manuals with all of our waste disposers, together with supporting literature and designated product support engineers, to ensure that maintenance is carried out correctly.”

Another biodigester seeking to gain sector share is the Power

Knot LFC unit. On the subject of dimensions, the American manufacturer’s president Iain Milnes said: “The space in some kitchens is very limited, especially in fast food restaurants and franchise or chain restaurants. However, in premium restaurants, and in kitchens in hotels, sports stadia, cruise ships, corporate cafeteria, and so on, there is generally sufficient space for an LFC biodigester.

“Further, most kitchens currently accumulate waste in large round bins that are taken outside infrequently. The LFC biodigester will often take less space than is currently occupied by those bins. Another consideration is that the LFC biodigester improves workflow and hygiene because the waste is disposed of as it is generated.”

As the process inside the LFC biodigester is aerobic, this should not produce bad smells typically associated with rotting food in a dumpster or on a landfill. “Typically, smells arise because the operator has left waste food lying around for too long and has deposited that decomposing waste into the LFC biodigester,” said Milnes. “It then takes some time before those odours are overcome and the machine

**“All waste food added to the machine is converted to waste water, and the machine never needs emptying.”**

returns to normal operation.”

He reported that the unit is constantly digesting and works best when waste food is added throughout the day. Power Knot offers seven different sizes of machine, with Milnes stating: “When sized properly for the kitchen, there should be no need to accumulate waste before putting it into the LFC biodigester. All waste food added to the machine is converted to waste water, and the machine never needs emptying.”

To operate the machine, the end user needs to open the door, put the waste into the drum, and close the door. The machine stops as soon as the door is opened and resumes operation immediately after the door is closed.

The LFC biodigester weighs the amount of waste that is ingested and displays this on the colour touch screen by the hour, day, week, month, and year. An LED indicates whether waste can be added: green for ok to add, yellow for prepare to stop adding, and red to indicate it is overloaded. Milnes revealed: “All this data is sent to the LFC cloud so that the operator and other stakeholders can how much waste is being processed, with a view to its reduction. One customer is using this information to plan menus that minimise waste.”

He believes the appliance is much quieter than most machines and appliances in a commercial kitchen. “The maximum sound level is 73dBa (measured at 1metre) – and that is for just 5 minutes of every 20-minute cycle. The rest of the time there is no sound at all. In any kitchen, this means that you will never know if the LFC biodigester is operating because the ambient noise is always significantly louder.”



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*The Power Knot LFC biodigester uses a ‘special’ blend of naturally occurring microorganisms to speed digestion.*

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