Tat-G On-site Organic Digester

A full description of the product and how it's moving vermiculture onto the viable best practise option list for commercial applications.

The Tat-G On-Site Organic Digester is a full stand alone organic waste processing system, capable of handling a variety of organic materials in combination with cardboard packaging materials. The systems processing capacities are rated at up to 350kg and up to 750kg per week. A multi tonne per week model is also available and built to order.
They have application where ever organic waste (cooked and raw food scraps, lawn and garden clippings, cardboard packaging materials, manures etc) can be collected and new fields are opening daily.
It's design is suitable for wide spread light commercial application, and currently sees service in the following fields, Dairy farms, Hotels, Schools, Resorts, Worm farmers, Restaurants, Gaming facilities, Sporting facilities, Mines, Canteens, and Office facilities.
The by products of the system can be used beneficially in and around the users facilities as the castings are a natural plant food, and can eliminate cost of fertiliser purchases.
Eliminating Organic waste from landfill is achieved, reducing greenhouse gas emissions and eliminating cost of removal, bin hire while reducing infrastructure needs.
Businesses that adopt the technology can benefit further by promoting their use of an environmentally friendly, best practise technology.

Having been awarded a Design Mark at this years Australian Design Awards, the Tat-G On-site Organic digester is designed to overcome public acceptance issues which currently limit the use of vermiculture as an acceptable method for on-site organic waste management.

A traditional system requires at optimum 1 square metre of surface working area (SWA) (SWA being the active area available for worm to process the waste materials) per 20kg of processing capacity per week.
A limitation with traditional systems has been the single plane approach to system design, therefore limiting the capacity achievable for a given area, typically resulting in a large land area to be made available for the systems installation i.e. to handle a waste stream of 350 kg per week the system would typically require a footprint of 17.5 sqm. This approach has severely limited light industries acceptance of vermiculture as an on-site solution to organic waste management.
The Tat-G Digester has taken a three dimensional approach to the problem.
Compost worms being air breathing organisms are most active within 200 -250mm of the surface exposed to the atmosphere, and as such a three dimensional approach in design has allowed capitalisation of this fact. The Tat-G Digester has suspended internally, a triangular cage. The triangular approach provides three rectangular surfaces equal to the Digesters footprint and two ends to the triangle; this provides over 10 sqm of SWA. The internal cage is further dissected at intervals of 600mm by mesh panels (accelerators), set at 85mm apart. The accelerators allow oxygen to flow completely around the smaller wedges of organic mass,

creating a further 4.4 sqm of additional SWA. The out come is over 14 sqm of SWA per 4.2 sqm of footprint. The STD commercial models (pictured above) footprint measures 2.6m x 1.6m.

The internal environment of the Digester is maintained at optimum through the application of a solar powered submersible pump. Pulling water from a 200lt on-board tank and dispersing it across the top of the organic mass at intervals programmed into the controller. Worms must be kept moist as they are 75% water and the correct internal environment must be maintained for optimum processing of the organic waste to occur. The controller incorporates a temperature probe that varies the pumps duration and frequency dependant on the ambient conditions, extending the duration and increasing the frequency during hotter months while returning to lesser setting during cooler months. The addition of water aids in temperature control by washing through the organic materials and reducing natural heat during the composting phase of the organic materials.
The controller also incorporates a regulator and three stage battery charging and monitoring system. The controller monitors the battery for temperature rise which indicates full charge has been reached, once established recalibration of the monitor to zero occurs. The monitor compares average battery input against average battery draw and in the event of draw exceeding supply will reduce the volts available to the pump until the monitor registers that the battery has been fully charged again. This controller ensures that maximum battery protection is obtained while also providing assurance that the system is able to maintain optimum conditions for the compost worm in the absence of human system management. The battery and solar system provide several weeks redundancy in the event of poor weather.
The primary design principles of the controllers programming was to "remove management requirements" of the vermiculture system. Traditional methods typically have substantial labour requirements involved in the maintenance of the system. There are six input/out functions within the program which allows for additional features to be added in the future, such as moisture meter etc.
The triangular design concept restricts the total amount of Digester surface exposed to the sun during the peak heat periods of the day. The sides of the digester are in shade during this peak period which aids in the ability of the controller and watering system to maintain the internal environment at optimal.

Excess water that is sprayed over the organic mass travels down via gravity to the lower edge of the triangular cage, and is returned to the tank via a liquid collection tray. The tray has incorporated a full length filter, ensuring that any foreign matter is stopped from entering the tank and damaging the pump.
The water is recirculated, limiting the systems management requirements further and conserving water in the process. Applicable issue for where town water supply is not available.

The triangular internal cage is constructed in a manner where the outer face of the cage on either side is made up of two panels, hung on the truss frame via a series of laser cut hooks. This feature provides for removal of the lower section in the event of a foreign object accidentally entering the system and becoming lodged in the lower section of the digester. Due to the hanging method employed, no tools are required to perform such a task.
All internal parts that are in contact with the organic mass are hot dipped galvanised and not one weld is used in its internal construction, ensuring that corrosion points are eliminated from the digesters design.

Solid casting is expelled from the Digester on a continuous basis, worm activity in and around the surface areas dislodges processed materials which fall to the inner of the outer skin. The outer skin acts as a slide directing the falling casting into 7 x 36lt containers, which are located in a suspended tray directly under the Digester. The containers are sized to limit the weight a person would be exposed to while handling them.

Access to the Digester is via a removable crank operated handle, cranking open the lid to provide full top access, allowing use of tractor front end loader if desired or manual application of materials during feeding.
Removing the handle provides security from unintentional entrapment.

The complete outer skin is removable providing access to the internal mass, both beneficial for providing quick visual inspection and also for educational purposes.

The Digester is available in kit form to reduce transportation costs or fully erected.

The Tat-G On-site Organic Digester is a stand alone vermiculture waste processing system. It's design breaks new boundaries in relation to application of vermiculture in a commercial sense. The application of various design principles described above, overcome many of the traditional vermiculture applications drawbacks and limitations, making it a commercially acceptable product for the future.

Tandem Digester – processes up to 750kg/wk