



RIVO'S VORTEX BIO WATER TREATMENT REACTOR VERMICOMPOST PRODUCTION METHOD & THINGS TO KNOW



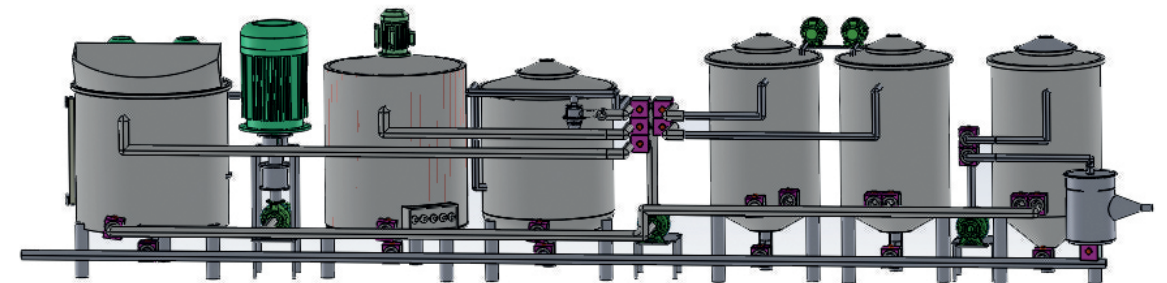
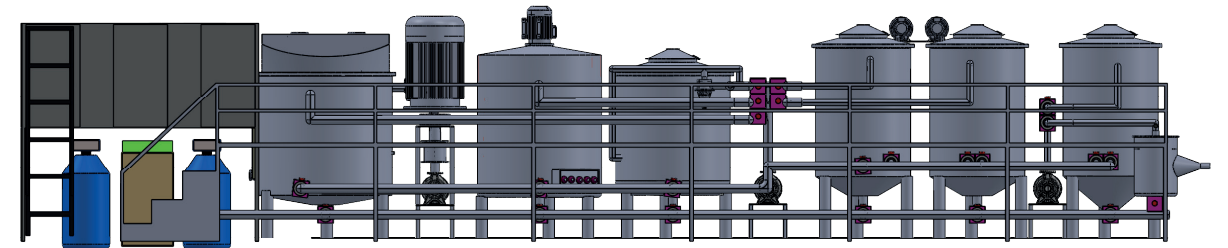
RIVO'S VORTEX BIO WATER TREATMENT REACTOR VERMICOMPOST PRODUCTION METHOD & THINGS TO KNOW

Rivo's Vortex Bio Water Treatment Reactor aims primarily to produce liquid and environmentally friendly organic (and organo-mineral) fertilizers based on the treatment of biological humus using a vortex reactor and hydrodynamic cavitation.

Rivo's Vortex Bio Water Treatment Reactor combines water activation and the 100 to 700 nanometer splitting of biological humus in a single device, thus changing the nature of physical and chemical processes in a single fertilizer production cycle.

P.S. The presence of stones, marble dust, sand and heavy metals in the biological humus prevents the reactor from working efficiently and reduces the quality value of the fertilizer to be obtained. According to our planning, the system does not contain a crusher or mill (Can be produced on demand).

The company that wants to produce liquid fertilizer with Rivo's Vortex Bio Water Processing Reactor liquid fertilizer should use a biological humus free from the mentioned stone, marble dust, sand and heavy metals during the production of liquid fertilizer.



The way to produce liquid organic fertilizer with Rivo's Vortex Bio Water Treatment Reactor is as follows: Only two components, water and biological humus, are used as raw materials. The water component used should have a minimum amount of chemical contamination and be of potable quality. Our recommendation is to use Pure Water [distilled water].

The most suitable water component should have the following recommended properties:

- *temperature 15 to 20°C;
- *general mineralization 0 to 10 ppm,
- *oxidation and restoration potential +200 to +300 mV
- *pH level 7 to 8.5

If necessary, the water is pretreated to have the recommended parameters, and when preparing the fertilizer, the water temperature should not exceed 50 degrees celsius.

Biological humus contains abundant humic substances, micro and macro elements, amino acids, enzymes, plant hormones, natural antibiotics and living and agronomically beneficial biological flora. There should be no stone, marble dust, sand and heavy metals in biological humus.

We recommend putting 70- 100 kilos of biological humus in one ton of distilled water.

The proper liquid vermicompost production process using Rivo's Vortex Bio Water Treatment Reactor and Riverm Vermicompost Technology consists of four stages:

FIRST STAGE is called **Pre-Activation of Water**

Pre-activation means changing the physical and chemical properties of water under the influence of the magnetic field created by hydrodynamic cavitation and cavitation. **The aim is to make the water become aggressive.** These factors initiate chemical reactions in water and change its structure and properties in relation to the dissolution of organic compounds and solids in water. It has been observed that more efficient results are obtained if this process is applied only to pure water. The process takes 30 minutes.

SECOND STAGE **Preliminary Preparation of Suspension from Biological Humus**

A biological suspension is made by mechanically mixing biological humus in pre-activated water. Biological humus is pre-decomposed to a size of about 0.5 mm and decomposes during the preparation of the biological suspension. The process takes 60 minutes.

THIRD STAGE Liquid Organic Fertilizer Production

At this stage, the degradation of the biological suspension is completed in active water to a size of 100 to 700 nanometers. The manure obtained in this way is saturated with the necessary major and minor elements by extraction from biological humus during its decomposition and at the same time activates the chemical reactions in the water component with its structuring. The total amount of dissolved minor elements and organic matter varies between 1200 and 1400 ppm. By increasing the pH indicator by 2 to 2.5 units, the suspension has an alkaline structure and its value as a fertilizer increases. The temperature of the suspension prepared in this way does not exceed 50°C. At the same time, the suspension thus produced is now ready for direct application as an organic fertilizer. The process takes 60 minutes.

FOURTH STAGE Microbiological Fermentation of Agronomically Useful Biological Flora in Initial Biological Humus

Fermentation takes place at a temperature between 30 and 40°C. This temperature, combined with continuous aeration, creates optimal conditions for the germination of bacteria, which is crucial to the overall efficiency of fermentation. Also, as the solid particles in the suspension decrease, the total usable area that can be occupied by the biological flora increases, so the resulting products become more efficient due to the increased number of beneficial bacteria present in it.

The fermentation process takes 2 to 8 hours optionally in Organic Fertilizer Production. (In Organomineral Fertilizer Production, it takes 1 to 3 hours, optionally). Then the manure is taken to the rest tanks.

At the same time, as phases 1 and 2 of the production cycle occur, **Rivo's Vortex Bio Water Treatment Reactor** treats water and fertilizer with a constant magnetic field with magnetic induction B=150-200 mT.

The magnetic treatment of the suspension also facilitates the alteration of its spatial structure so that the water can be actively hydrated with the ions of the minor elements that make up the biological humus.

In addition, magnetic treatment of water reduces the surface tension, so that small and large elements from biological humus, together with water, can better penetrate through the intracellular membranes of plants and have a positive effect on the processes of photosynthesis in plants.

After magnetic treatment, the antifungal [decontamination] properties of the water component increase and the plants are less exposed to various diseases and have more robust and healthy growth. This reduces the need to apply various chemicals to combat plant diseases.

This mode of production allows the production of organic fertilizer containing the following elements [% of mass]:

Nitrogen	0.005-3.0
Phosphorus	0.005-3.0
Potassium	0.03-3.0
Calcium	0.005-1.0
Magnesium	0.004-0.5
Iron	0.0003-0.05
Manganese	0.00001-0.001
Copper	0.00005-0.005
Water-soluble humates	0.0001-0.6

The beneficial biological flora of organic manure [worm castings] may contain bacteria clusters from 1×10^6 to 1×10^{12} per ml.

The fertilizer produced in this way contains abundant humic substances, micro and macro elements, amino acids, enzymes, plant hormones, natural antibiotics and living and agronomically beneficial biological flora.

It is more accessible to plants, activates the biochemical process in plants, increases their immunity, significantly increases the efficiency of root and leaf nutrition of plants.

All this leads to higher yields of agricultural crops and increased crop quality and vegetation of ornamental plants. It is suitable for indoor use as an additional feeding for ornamental plants, as the fertilizer has no odor. Since the fertilizer contains a significant amount of potassium humate, the soil forms a water-resistant fine structure that facilitates soil water conservation in the root zone.

The high content of beneficial biological flora in humus, which produces biologically active substances, makes plants more resistant to diseases and pests and stronger against adverse weather conditions.

Fertilizer has a significant effect on soil acidity and its ability to change its structure to optimize the humus content in the soil, thereby facilitating soil restoration. A liquid form of the organic fertilizer thus produced can be processed as a dispersion system comprising a liquid dispersion medium and a solid dispersion phase [suspension].

Such a suspension would be as effective as water, as the biological humus breaks down to 100 to 700 nanometers in size. The organic fertilizer has the warranty period is up to one year if kept closed.

P.S. With Rivo's Vortex Bio Water Treatment Reactor , you can produce Organic Liquid Fertilizer as well as Organo-Mineral Liquid Fertilizer.

P.S. While producing organic fertilizer, our application suggestion may change with the suggestions we will make together.

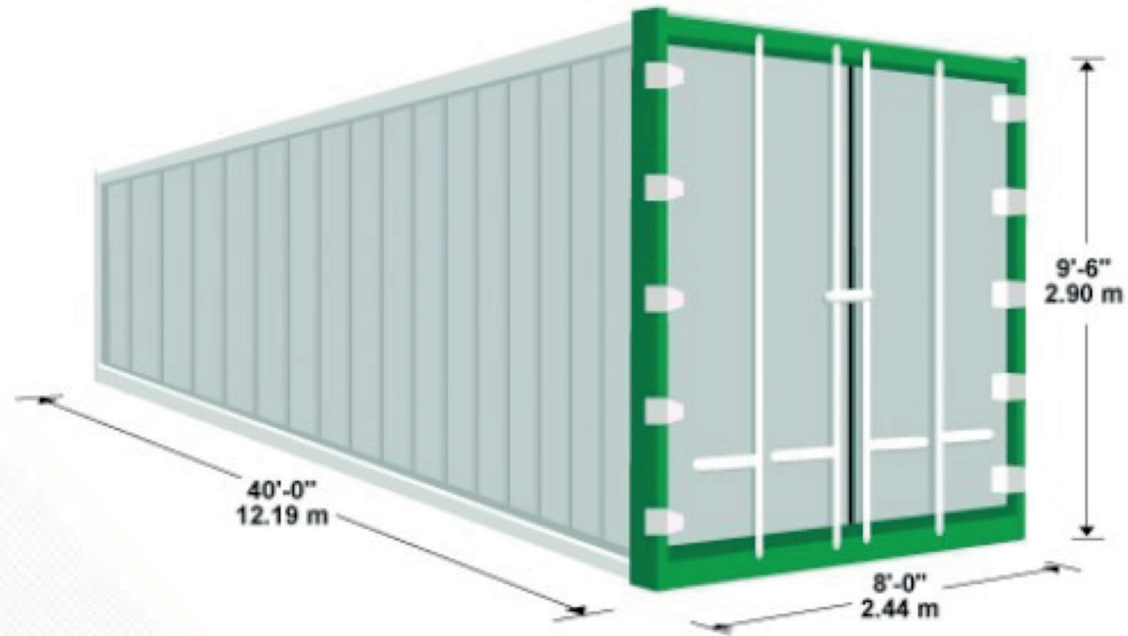
P.S. In order to produce with **Rivo's Vortex Bio Water Treatment Reactor**, you must pass the Operator Course. Operator Course is given at your or our facility, the course duration is determined as five working days and can be extended upon request.



Production capacity 2 tons.



Production capacity 2 tons.



Rivo's Vortex Bio Water Treatment Reactor can be installed in a 40' container and can be sent to your country as well as assembled at the place you show.

Reactor in Container Ready for Use



Production capacity 1 tons.



Manufacturer Title

Riverm Kompost Vermikompost Tarım ve
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