The facility for production of compost and artificial soils

Technology of processing and utilization of organic waste by composting in “climate chamber”

Facility in Ramenskiy district, Moscow region

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Benefits of the technology

Implementation and operation	The construction period is 5-7 months, taking into account the delivery of equipment. Availability of standard design and project documentation. Remote access to control provides control of processes from anywhere in the world where there is access to the Internet.
Capacity of facility	Typical solutions are suitable for various raw materials and represent an opportunity to operate the production capacity of the facility. The modular arrangement provides the production capacities from 5,000 to 500,000 tons per year or more. Composting time is 4-6 weeks, which increases productivity 2-3 times compared to analogues
Costs	Specific costs for the organization of production range from 500 to 1000 rubles per ton of annual production capacity. Low capital costs and operating costs ensure a quick return on investment; Automation of processes involves the involvement of the minimum trained staff
Ecology	A minimal sanitary protection zone is provided due to the practical absence of harmful emissions

Requirements for land and infrastructure

Parameter	Required/min
Min space of the land plot	2 hectares (will provide reception up to 150,000 tons per year)
Type of permitted use	12.2 Special activity
Sanitary protection zone	300 м

Required engineering infrastructure:
Access road, power connection, well / water supply for drinking and technical needs, water disposal, Internet network.

Brief summary

•The Company offers an effective solution to the issue of bio-organic waste disposal through the construction of facilities for the production of composts and artificial soil.

•World experience shows widespread use of similar solutions in the field of waste management.

•Applied technology is fully adapted to different conditions.

•The process of disposal of waste and production of products are fully complied with the requirements of the current legislation on environmental and sanitary-epidemiological safety

•The State Ecological Expertise gave a positive conclusion to the technology of processing and utilization of organic waste by composting in a climatic chamber

•The products received in the process of waste utilization are in demand in agriculture, forestry and communal services, truck farming, landscaping and restoration of disturbed lands.

Benefits of the technology

Reduction of emissions	
Type of emission	Coating efficiency of membrane
Odors	Decrease by 90,97 % (1, 2, 3)
Bio-aerosols	Decrease by 99,99 % (1,3)
Dust / solid parts (4)	Decrease by 99,99 % (4)
Ammonia	Decrease by 90-95 % (7)
Volatile organic compounds	Decrease by 90-95 % (7)

1. [132, Kuner 2001].
2. [149, Kuner 2000.]
3. Source material: Biological wastes; measurements made with the same product as in (6).
4. PM 2.5 Efficiency of particle filtering in accordance with VDI 3926. Part 2. Testing the filter material of cleaned filters under operating conditions. These tests were performed on the GORE® L3650, a dry filter element with a porous PTFE membrane with a wider porosity, solely for experimental purposes.
5. [133, Shmidt 2009].
6. Source material: Solid biological waste / sewage sludge; measurements made with GORE® Heap Cover with a semipermeable PTFE GORE® membrane.
7. Measurements were made with various source materials in the framework of the project to recognize the GORE® Heap Cover as the best developed cleaning system (BACT) in accordance with Rule 4565 and Rule 4566 of the San Joacim Wolley Regulation for Air Emissions Control, and the Regulation 1133 Regulation on Air Quality Control in Southern California.

Benefits of the technology

Comparison of amount of emission with analogues				
Type of processing of organic waste	Emission of g / ton of processed material			
	Methane	Nitric oxide	Ammonia	NMVOS
Composting under the membrane in climate chamber	**30** g/ton	**16** g/ton	**10** g/ton	**300** g/ton
Open composting	1 900 g/ton	110 g/ton	470 g/ton	370 g/ton

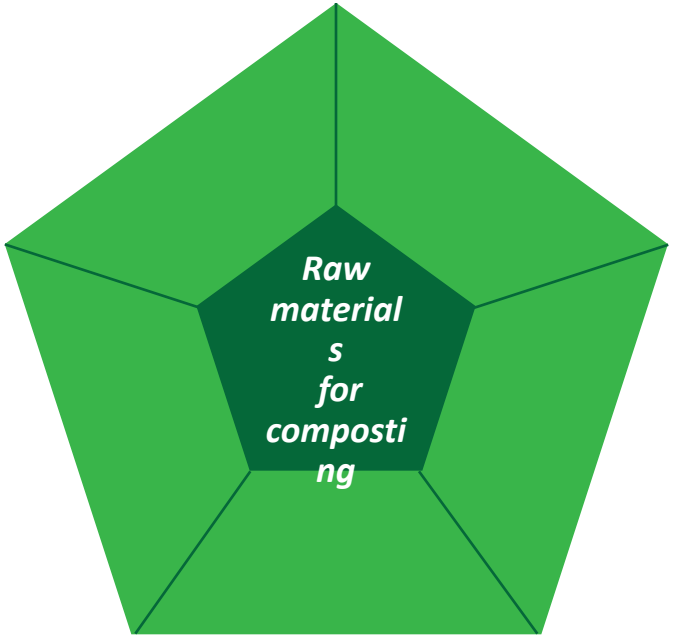
NMVOS - Non-methane volatile organic substances such as benzene, ethanol, formaldehyde, cyclohexane, 1,1,1-trichloroethane or acetone.

Raw materials


Food waste

Organic waste from food industry

Sludge from sewage



Organic part of solid municipal waste

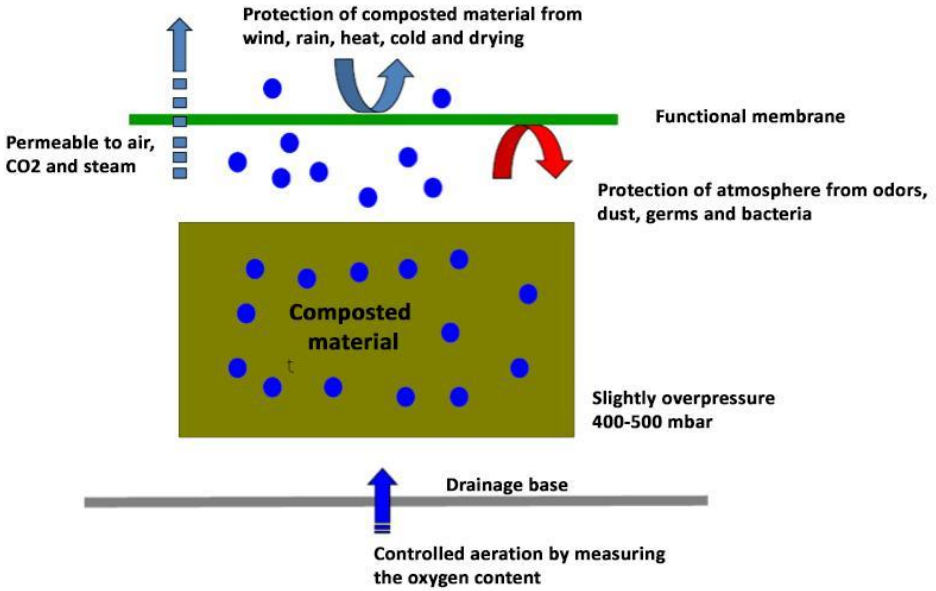
Plant waste, including agricultural production, communal and forestry facilities

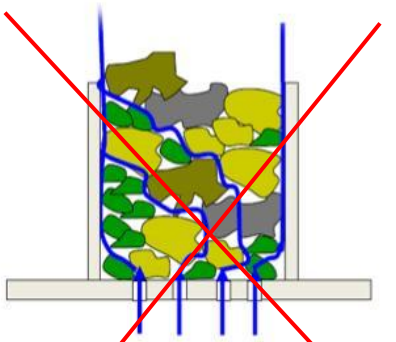
Main types of products

Type of compost	
Type «C»	is used to grow basic crops in horticulture as fertilizers, as well as in the production of artificial soil-like substrates, soil and nutrient soils for closed soil
Type «C1»	is used for the cultivation of basic crops, as fertilizers, as well as for the production of artificial soil-like substrates, soil and nutrient soils for open ground
Type «P»	is used for the cultivation of technical agricultural crops (grain, fodder, technical), in forestry, forest and flower farms, for landscaping and landscaping
Type «P1»	is used as technical composts and soil for the technical reclamation of land

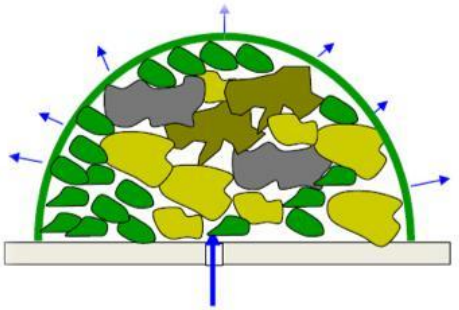
Principle of work

The application of semipermeable membranes





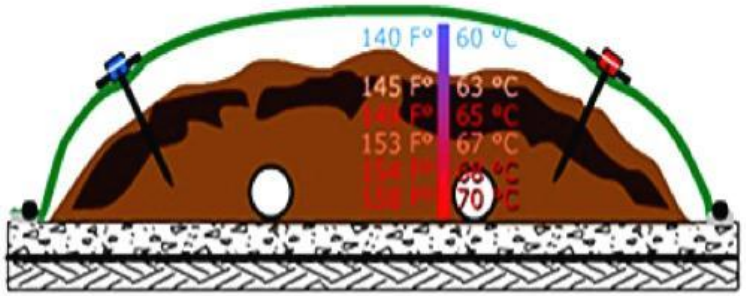
No overpressure
Uneven aeration
Danger of occurrence of anaerobic zones H2S and NH2, causing corrosion of measuring probes
The substrate decomposes unevenly



Low excess pressure
Uniform aeration
Uniform decomposition of the substrate
Complete absence of anaerobic zones

Principle of work

The climatic chamber under the membrane

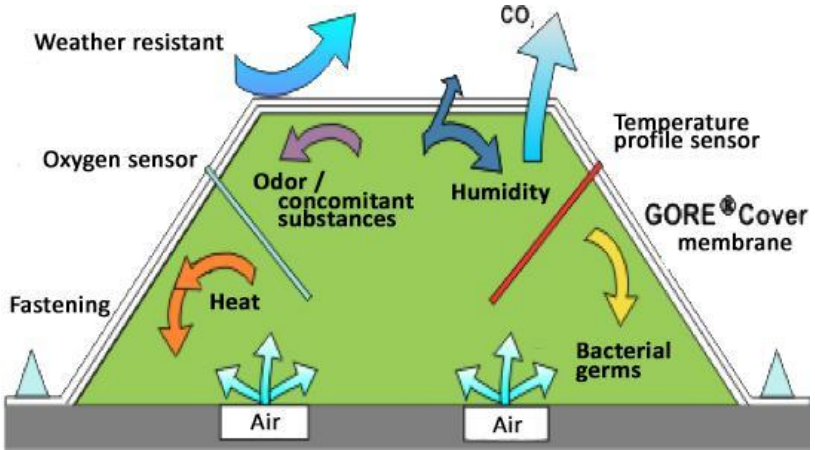


Rigid construction	Airing
Aeration channel	Oxygen sensor
Compostable materials	Temperature profile sensor
Membrane	

Components of the system

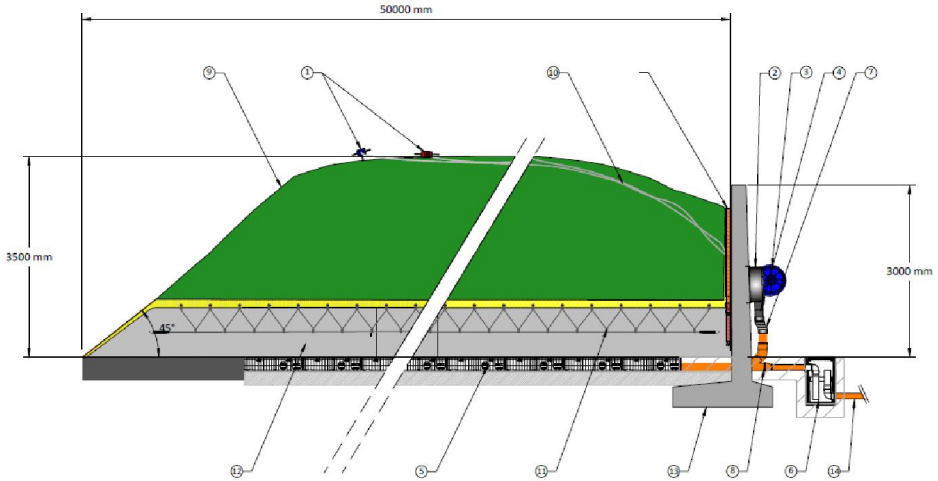
Air control	Odor elimination
Weather resistant	Retention of bio-arozole
Humidity control	Sanitation

Properties of the system



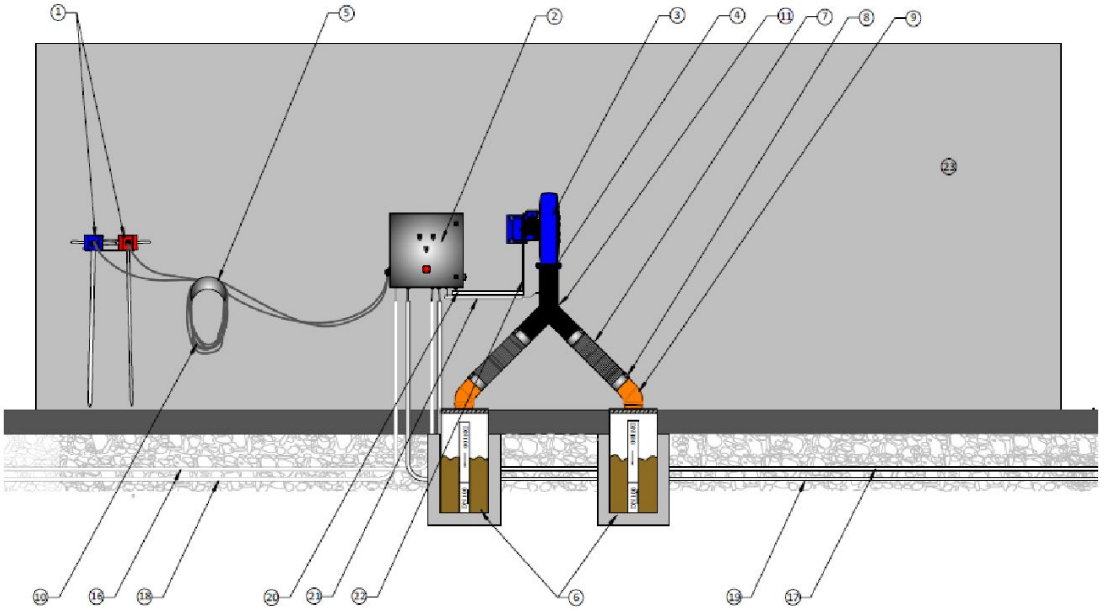
Engineering solutions

Aeration and sanitation system



General view of the climatic chamber

The wall of the climatic chamber for the placement of aeration equipment and control systems



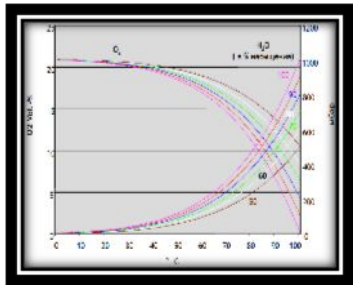
Engineering solutions

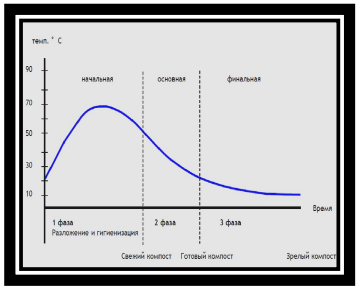
The system of covering the climatic chamber with membranes

Fully automated system with remote control capability

Engineering solutions

Software and hardware complex for control





Engineering solutions

Availability of standard design and project documentation