THE PROJECT FOR RECYCLING SEWAGE SLUDGE IN TO ORGANO-MINERAL FERTILIZERS

www.suosil.com | info@suosil.com

GLOBAL PROBLEM DESCRIPTION

- ✓ 10 Million tons of sewage annually in Europe alone
- ✓ +10,7 % annual increase in the volume of sewage precipitation and as a result of waste
- ✓ Globally 2 billion hectares of land are subject to anthropogenic soil degradation
- ✓ Shortage of fertilizers on the world market
- ✓ Aging water infrastructure globally. 30-60% of wastewater treatment plants do not meet the requirements, WWTP from the 1980s-1990s require major modernization

PROBLEMS AND NEEDS OF THE MARKET

As a tendency a switch from greenhouses to hydroponic solutions, meaning the increase demand for liquid fertilizers

Development of the organic farming sector – growth in demand for organic produce

Development of alternative fertilizers, analogues to chemical fertilizers

The need for new effective technologies for sewage sludge treatment

- ✓ Increaseing amount of sewage sludge waste accumulation each year
- ✓ Soil depletion and degradation due to chemical fertilizer use
- ✓ Water recourses are limited
- ✓ Lack of full circle, accessible, mobile technologies that are inexpensive to operate

ONE TECHNOLOGY — THREE SOLUTIONS

ECOLOGY — DISPOSAL OF SLUDGE WASTE

AGRICULTURE — PRESERVE SOIL AND INCREASE FERTILITY

INDUSTRY — PRODUCTION OF TECHNOLOGICAL EQUIPMENT

OUR CUSTOMERS

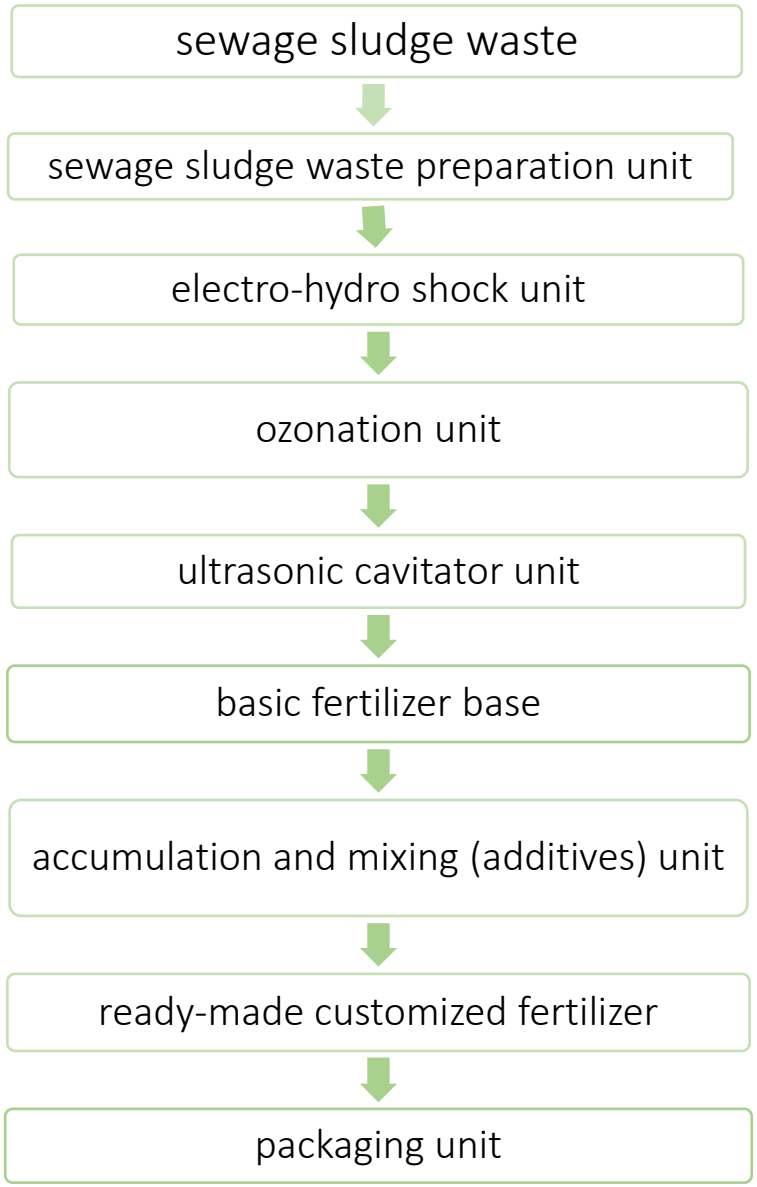
SEWAGE TREATMENT PLANTS

GREENHOUSES AND FARMS

LIVESTOCK COMPLEXES

FERTILIZERS FOR WHOLESALERS

TECHNOLOGY DESCRIPTION



- The SUOSIL technology is based on the use of renewable sources of raw materials and the recycling of nutrients, which is a very economically efficient way.
- The technology allows to process sewage sludge without the use of reagents and high temperatures, preserving living organic matter.
- The technology is significantly superior to alternative processing methods in terms of energy consumption.

ADVANTAGES OF TECHNOLOGY

Parameter	SUOSIL	Cambi	Veolia	PEF Systems	Biogas	Hybrid (UZ/Ozone)
Technology Type	EHU + cavitation + ozone	Thermal hydrolysis	Drying	Electro-impulses	Biological	Ultrasound/Ozone
Energy Consumption kW/h	10–100	600–1500	800–2000	100–200	Low	Medium
Capacity m^3/hour	3	20–100	10–50	1–5	long cycles	5–10
Pathogen Elimination	YES	partial	partial	no	no	no
Homogenization	YES (to 100 µm)	no	no	no	no	no
Odor Removal	100%	80–90%	60–80%	50%	weak	70–80%
Final Product	Liquid organo-mineral fertilizer	cake	granules	liquid mass	digestate	unstable
Patent	multi-stage processing	thermal hydrolysis	drying processes	PEF	no	no

EQUIPMENT OFFERED

SPECIFICATIONS

- Manufacturing time: 6-10 months
- Warranty: 2 years

- Capacity: 1-3 m^3/hour
- Power consumption: 100 kW
- Staff: 2 people
- Size of a 40-foot container
- Annual productivity: 25,000 tons/year

BIOSOLID OFFERED

SPECIFICATIONS

- Microbiology is normal → the sludge is hygienically safe.
- Organic matter is partially oxidized → becomes more accessible (low-molecular acids, humus-like substances).
- The liquid phase contains dissolved nitrogen (NH_4^+, NO_3^-), phosphates, potassium, and sometimes trace elements (Fe, Zn, Cu).
- Heavy metals – remain bound in shape and conform to the norm

RESULTS OF ANALYSIS ACCORDING TO EU/US STANDARD

№	Element	After treatment (mg/kg))	EU	USA	Correspondence
1	**Cadmium (Cd)**	2.3	≤ 10	≤ 39	✅
2	**Arsenic (As)**	1.4	≤ 20*[1]	≤ 41	✅
3	**Mercury (Hg)**	0.0011	≤ 16	≤ 17	✅
4	**Lead (Pb)**	17.1	≤ 750	≤ 300	✅
5	**Copper (Cu)**	157	≤ 1000	≤ 1500	✅
6	**Zinc (Zn)**	129	≤ 2500	≤ 2800	✅
7	**Nickel (Ni)**	7.1	≤ 300	≤ 420	✅
8	**Chromium (Cr)**	15.7	≤ 100*[2]	≤ 120	✅

- Concentrations of all heavy metals in the reprocessed material are 10-100 times lower than the maximum levels established by the EU and the US.
- The largest safety margin is observed for Hg, Cd, Ni, and As—their values are practically at background levels.

Conclusion

- The treated sludge after the cleaning stage complies with the standards of EU Directive 86/278/EEC and US EPA 40 CFR Part 503.
- It can be classified as an environmentally friendly biosolid (Class A Biosolid), suitable for use as a fertilizer.

SUOSIL FERTILIZER RESEARCH*

Table below - determining the class of fertilizers

Metals	Limit value Finland (LVL24/11)	Limit value EU organic (2019/1009)*	Limit value EU (2019/1009)	Quality fertilizer	PERMITTED CONCENTRATIONS FOR CLASS A** SUOSIL liquid fertilizer	Organic quality A	Organic quality B	Arable land
As	25		40	25	5,9	5,3	5,3	5,3
Cd	1,5	0,7	1,5	1	0,12	0,29	0,15	0,62
Cr	300	70	Not specified	200	3,5	9,5	4,6	19
Cu	600	70	300	500	3,1	51	22	140
Hg	1	0,4	1	0,75	0,08	0,12	0,07	0,18
Ni	100	25	50	50	3,5	12	3,6	23
Pb	100	45	120	70	2,3	2,1	2,1	2,5
Zn	1500	200	800	1000	5,9	180	71	430

The submitted samples were tested for heavy metal concentrations and hygienic quality.
The table shows the permitted concentration limits in Finland and the EU, as well as in products established for organic products in the EU and the corresponding fertilizer quality certificates.

**fertilizer evaluation is based on laboratory samples of SUOSIL obtained at the Forestry Academy*

*** the indicated deviations by 10% for Pb and AS are reduced to the required values when diluted with 10-20% additives (NPK), which were not used on the tested samples*