SOLAR DRYING
OF
SEWAGE SLUDGE.
End product of all types of sewage works is the cleared water and a more or less liquid mass: the sewage sludge. The volume of the untreated sludge is enormous, as it still contains over 95% of water. Using different mechanical methods this volume can be reduced significantly, but the water content can only be reduced - depending on the system and investment - to a maximum of generally not less than 65 to 75 %. This means, that the remaining mass to be transported and disposed of is still high and any type of interim storage is difficult. Moreover, every kilogram of water remaining in the sludge restricts its use and its disposal involves high costs.

Unlike mechanically dehydrated sewage sludge, dried sludge is biologically stable. The remaining water content is minimal, it does not smell and the product is suited for all ways of disposal: combustion, land-filling, agriculture and others. Conventional drying methods, however, requires enormous investments and the energy consumption is high. Therefore, until now, drying has been considered to be a suitable solution only for big stations.

In contrast to this, THERMO-SYSTEM and the University of Hohenheim have refined an environmentally friendly technology which requires much lower investments: Solar Drying.

Fully mechanized, microprocessor-controlled and successfully tested during several years in Germany, the system has proved to be suitable for small as as well as for middle-sized plants. The dryers work with or without mechanically dehydrating the sludge before drying and a flexible adaptation of the grade of mechanization to the local requirements is easy. The weight of the dry end-product is less than 10 % of the original - and, in most cases, the odor is comparable to that of soil.
Our solar plants achieve highest efficiency through the following characteristics:

- The plant is completely enclosed by a well insulated and highly transparent cover which even withstands hail, wind up to 120 km per hour and heavy snow. This cover prevents the uncontrolled exchange of air and therefore the unnecessary loss of heat.

- Ventilators found inside the plant constantly set the optimal velocity of the air-stream over the drying sludge - irrespective of conditions prevailing outside the plant.

- Air exchange is controlled with the utmost precision by ventilation flaps.
- Depending on surrounding air conditions, ventilators deliver large amounts of fresh air from time to time, thus taking maximum advantage of the drying potential of the ambient air. This source of energy does not depend on the solar radiation falling on the surface of the plant.

- Our "electric mole" mixes and granulates the material to be dried - a clever alternative to big and expensive equipment. Let us surprise you!

- As an option, we offer a congestion and maintenance-free drainage system for our plants. An interesting feature especially for smaller sewage works which doesn’t have a mechanical dehydrating system.

- Different and simple-to-use drying programs do allow a fully automatic, partly automatic or manual adjustment of the drying process, thus optimizing the efficiency of your plant.

- All relevant parameters inside and outside the dryer are measured by electronic sensors. A modern microprocessor calculates all the prevailing quantities and steers and monitors precisely all single components.
To meet best the requirements of our clients the THERMO-SYSTEM-TECHNOLOGY is based on the following principles:

- A moderate investment allows flexible decisions
- An ecologically friendly process is economically meaningful and assures public acceptance.
- The ability to fit in existing structures and to extend the facility modularly allows tailor-made solutions, saves money and imparts confidence when making decisions.
- Robustness, safety and high-performance are the base for a professional operation.
- „Intelligent“ components and microprocessor-technology restrict working and monitoring time which in turn cuts down on costs.

The following six factors play a decisive role in sewage sludge drying and are therefore continuously monitored and controlled to assure a most economic and efficient performance of our system:

1. The temperature of the drying air
2. The relative humidity of the drying air
3. The temperature of the sludge
4. The air velocity of the drying air
5. The surface structure and moisture of the sludge
6. The ambient conditions (temperature, relative humidity, solar radiation)
THERMO-SYSTEM is modularly build and adaptable
The width, length and height of our dryers are variable an the plants can be erected on any surface, be it concrete, tar, or a meadow, a plane or an inclined area. At the same time, our system is suitable for all types of sludge – not dehydrated, fully or partly pre-dehydrated sludge; aerobically or anaerobically stabilized sludge or raw sludge; communal sludge or industrial sludge; ...

THERMO-SYSTEM is flexible
Depending on location, sludge and individual preferences, we work with all types of construction materials like galvanized steel, stainless steel or aluminum and different types of roofing like three-layer air bubble foil, well isolating polycarbonate or glass.

THERMO-SYSTEM is variable
We offer solutions from low cost transparent roofing with self-regulating, solar powered ventilators up to high-end fully automated solar plants. Whatever percentage of water your sludge contains – 60%, 75% or 95% - and whatever dry matter content you want to reach - We can offer you a solution.

THERMO-SYSTEM is environmentally friendly
The microprocessor-based controlling system is a standard fitting in all our plants. This device assures that the drying potential of the ambient air and the incoming solar radiation are used to maximum so that the need for additional energy is kept at a minimum.

THERMO-SYSTEM is professional
The components we use have all been successfully tested over a long period of time and they have proved to be reliable in industries. As a matter of course, it is possible to link several drying chambers, register and monitor reference dimensions, control all microprocessors centrally and offer a far-away maintenance by us via modem/telephone line.

THERMO-SYSTEM is innovative
We work in close partnership with the leading scientists in the field of solar energy utilization and drying technology and we apply the latest findings in our plants. New ideas help us to solve problems in an innovative way - protecting the environment and reducing the costs.

THERMO-SYSTEM responds to your wishes
Whether you want to involve manpower or prefer automatic control, whether you want to be energetically independent or not, whether you want to use a conventionally fired back-up heating system or solar energy only - all depends on you! We will help you to find the best solution to fit your fit needs.