SLUDGE DRYERS
GIOTTO WATER HAS TECHNOLOGIES TO BEST MEET ALL DRYING REQUIREMENTS!

Thermal drying is a process for the reduction of the volume of wet solid products, by removing the water and achieving dry solids concentration over 90%. This process has proven applications in both the environmental field (volume reduction of sludge from wastewater treatment plants) as well as in production processes of industries, such as chemical, pharmaceutical, food processing and minerals processing. In thermal drying process, the final product is stabilized in a dry granular form that simplifies the storage, delivery, use or disposal.
APPLICATIONS

thermal drying of sludge allows to obtain a final product suitable for reuse in different applications depending on the composition of the product treated.

Sludges:
- Municipal wastewater treatment
- MSW Anaerobic digestion
- Distilleries
- Breweries
- Slaughterhouses
- Farms
- Tanneries
- Oil mills
- Textile industries
- Chemical/pharmaceutical

Other products:
- Food industries (soybeans, yeasts, starches, etc.)
- Pharmaceutical industry (mycelia, pectines, etc.)
- Chemical industry (hydroxides, acrylic emulsions, polypropylene, PVC, etc.)
- Mining industry (coal, iron and copper dust, carbonates, calcium sulphate, etc.)

Advantages:
- Minimal environmental impact
- High energy efficiency of the process
- Final product in a granular form, dust free
- No reduction of organic matter
- Flexible, simple and safe operation
- Reduced time of start-up and shut-down
- Complete automation
- Low operating and maintenance costs
THE TECHNOLOGIES

Regardless of the design requirements (type of product to be dried, available energy, evaporation capacity, etc.), Giotto Water is able to offer the technological solution most suitable for every problem, adapting the project to the Customer needs.

CTD - Convective Thermal “triple pass” drum dryer
The wet product is dried by an hot air stream. The process is performed inside an enclosed rotating drum consisting of three coaxial cylinders. Water evaporation capacity ranges from 1,000 to 10,000 kg/h.

ECOFLASH - Thin Layer Dryer
A high speed rotor centrifuges the product on the internal hot wall of a stator, heated with diathermic oil or steam, which transfers the heat to the "thin layer of sludge." Water evaporation capacity ranges from 750 kg/h to 3,000 kg/h.

SBD - Sludge Belt Dryer
Able to work with different energy sources and particularly suited to the reuse of waste heat at a low temperature. It has extreme operational flexibility, also with products to be treated at variable characteristics, thanks to the possibility to adjust the belt speed and the process temperatures. Water evaporation capacity ranges from 250 to 6,000 kg/h.
CTD - CONVECTIVE THERMAL DRYER

The wet product is dried by an air stream, heated by a heat generator. The process is performed inside an enclosed rotating drum consisting of three coaxial cylinders. There are no rotating parts inside the drum with no wearing problems. The dried product has a homogeneous and granular shape and is recovered in the product-process air separation section.

- Different plant configurations are available according to the specific project conditions:
- Total recycling of the process air, heated in an air/air heat exchanger arranged in series with the heat generator
- Heat recovery from cogeneration plants or other waste heat sources
- Reduction of washing and condensation water, through recirculation and cooling with evaporative towers.
- Exhaust gas deodorization by thermal, biological or chemical treatment.

<table>
<thead>
<tr>
<th>Model</th>
<th>Evaporation capacity (kg/hr of water)</th>
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<tbody>
<tr>
<td>CTD 1000</td>
<td>1.000</td>
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<tr>
<td>CTD 2000</td>
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<td>CTD 3000</td>
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ECOFLASH - THIN LAYER DRYER

The product to be treated is introduced into a drying chamber, constituted by a jacketed stator heated with diathermic oil or steam. Inside the stator a cylindrical coaxial rotor with adjustable paddles operates at a peripherical speed of 30 m/s. The product is centrifuged on the stator in a thin layer of 5 mm thick, in contact with the hot wall. The paddles mix and extract the dried product, while an air flow in countercurrent allows the extraction of water evaporated and cools the dried sludge simultaneously. The limited amount of air has the only purpose of transporting the water evaporated during the drying process, while all necessary heat is provided by conduction through the wall of the stator. The drying process is single passage, continuous without recycle. The dried product is granular, and dust free.

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<tr>
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<tr>
<td>EF 14.5/80</td>
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<td>EF 14.5/100</td>
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<tr>
<td>EF 18/110</td>
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<tr>
<td>EF 19/110</td>
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**Legend:**
- **CL101** Boiler
- **P101** Mohno pump
- **DR101** Drying drum
- **RV101** Rotary valve
- **SC101** Discharge screw
- **PC101** Heating medium pump
- **CS101** Scrubber
- **DM101** Demister-Drops separator
- **VE101** Delivery fan

**Diagram:**

- **CS101**
- **DR101**
- **SC101**
- **P101**
- **Washing Water**
- **Discharge in Atmosphere**
- **Wet Sludge**
- **Dried Product Discharge**
- **Fuel**
- **PC101**
- **RV101**
**SBD - SLUDGE BELT DRYER**

The belt dryer is a convective dryer, where the water is evaporated by a stream of heated air, that goes in contact with the wet product during its transport on a belt. The dryer is configured with two drying belts, which allow to obtain the correct contact time between sludge and hot air making it extremely flexible in terms of flowrate and final dryness achievable.

An inlet distribution system is necessary to preform the dewatered sludge and distribute evenly over the width of the upper belt for further transport within the drying tunnel, where a ventilation system allows air to distribute the sludge in a uniform and constant manner.

The main advantages of this technology are:

- Application with different types of product input (organic and inorganic)
- Pelletized final product with no dust.
- Reduced energy consumption and possibility of recovering heat from sources available at a low temperature.
- Low emissions.
- Low process temperature.
- Easy installation and reduced footprint.
- Modular construction.

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<tr>
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<tr>
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<td>SBD 2/6 M</td>
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GIOTTO WATER S.r.l.
Via Prati Nuovi 23
27058 Voghera (PV) Italy
Phone: +39 0383 1918330
Fax: +39 0383 1918311
Web-site: www.giottowater.com