



DRYWVA

INNOVATIVE INTEGRATED SYSTEM FOR DRYING SEWAGE SLUDGE

... a Solwa Innovation

THE COMPANY

SOLWA is an Innovative Company part of the Multinational Corporation **SANTEX RIMAR GROUP**, which works worldwide with manufacturing branches in Italy, Switzerland, India and China.

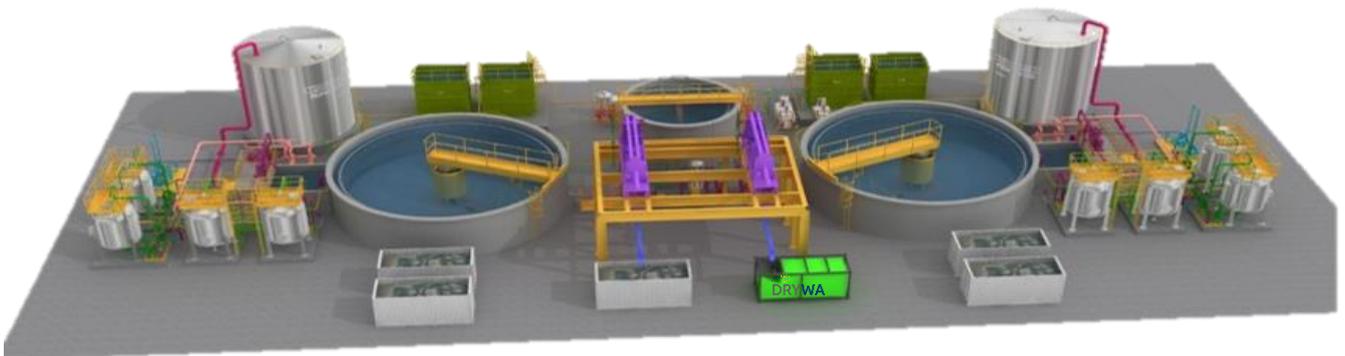
Solwa is a specialist in the water treatment sector and dehydration processes, using solar & renewable technologies, awarded by national and international Organizations (i.e. MIT as “Italian innovation of the year”, the UN as “Innovation for Human Development”, “Success Story” for UE Commission).

Solwa Technology is employed in different fields:

- **DryWa** for drying sludge
- **DigeWa** for drying digestate
- **WastWa** for treating leachate
- **FoodWa** for drying food
- **SolWa** for water treatment
- **IrriWa** for agriculture in barren areas

THE SLUDGE MANAGEMENT SECTOR

The sewage sludge production corresponds to about the 1% of the treated water. Whereas the water treatment is a quite fast process, the storage and disposal of the sewage sludge takes long time. For these reasons, the management of sludge burdens with 40-50% on the total cost of the wastewater treatment. Drying process allows having dried sludge, around 80-90% of Dry Matter (DM). This process is necessary to have a smaller volume and mass to be disposed of or to be reused.



Example of Waste Water Treatment Plant with DryWa module

THE DRYING PROCESS

To what concerns the treatment of secondary biological sludge, it is possible to achieve a final humidity of 20% (DM = 80%).

The advantages of thermal drying are the reduction of transport costs (-70%), the reduction of pathogen microorganisms (-100%) and the increase of store capacity (+66%). The normal disadvantages in the common dryers are the high initial and operation costs (fossil fuel combustion), including the need of skilled staff for the different activities.

DRYWA SYSTEM

DryWa is an innovative system to dry secondary sewage sludge of urban wastewater plants. When sewage sludge achieves around 80% of Dry Matter (DM), it can be burnt inside the system. The DryWa drying process is accelerated and the surface needed for the whole process is reduced.

DRYWA ADVANTAGES
Reduction of waste volume and weight
Increase of drying speed
Surface minimization
ROI in the short period
Stand-alone system by sludge combustion

Reduction in mass and volume	<ul style="list-style-type: none"> - 90% Reduction in transportation costs Reduction of fossil fuels consumption Reduction of CO₂ emissions Reduction of environmental pollution
High temperatures used in drying process	<ul style="list-style-type: none"> Killing pathogens and contributing to sludge stabilisation Ammonia extraction
Dried sludge characteristics	<ul style="list-style-type: none"> Sludge becomes a suitable combustible source No putrefaction phenomena, thanks to the water absence

DRYWA TECHNICAL DESCRIPTION

DryWa is a product completely different from the existing technologies on the market, thanks to its performances, design, technology and size. It can be placed directly inside the Waste Water Treatment Plant without any modification.



DryWa module location in a Water Treatment Plant



DryWa Module

The dried sludge can be used as fuel to heat. DryWa has been planned as an industrial oven, reducing the thermal dispersion outside and improving its drying performances. DryWa is a system to dry and incinerate sewage sludge, where the input is the wet sludge (around 25% DM) and the outputs are ashes and emissions into the atmosphere (steam and gasses).

A high performance heater inside the system, which is powered by the burnt sludge, generates the drying process, allowing DryWa to be a stand-alone system in terms of thermal energy.

SOLWA

A single DryWa module treats around 1 K ton/year of sewage sludge, with an initial 25% DM. The technical characteristics are indicated in the following chart:

DRYWA INPUT		
Capacity per year	Ton/year	±1.000
Capacity per hour	Kg/hour	±119
Initial sludge Dry Matter	%	±25
DRYWA OUTPUT		
Weight reduction	%	68
Dry sludge output	Ton/year	312,5
Final sludge Dry Mater	%	80
Water emitted by dryer	Kg/hour	71,4
DRYWA OUT PUT WITH BURNER		
Ash production	Ton/year	64,4
Water emitted by dryer	Kg/hour	71,4
Water emitted by burner	Kg/hour	17,85
THECNICAL CHARACTERISTICS		
Electrical power consumption	KWh	±5
Thermal power consumption	KWh	≤100 (auto production)
Volume of air circulation	nm ³ /hour	±3.500
Working temperature	°C	70-95
Size (l * w * h)	m	6 * 2,5 * 2,5
Maximum stackable modules	n°	3

DryWa has the size of a naval 20 ft container (easy to move) and each module treats 1Kton/year of sludge at 25% Dry Matter. DryWa modules can be stacked into vertical systems, to increase the drying production as shown in the picture below.



Single DryWa module



DryWa system with three stacked modules

DRYWA TECHNICAL ADVANTAGES

- **REVOLUTIONARY HIGH PERFORMANCES SLUDGE DRYER**
With a specific patented technology able to optimize the water extraction performances with less energy and less hot air volume needs
- **SAVING THE 90% OF YOUR SLUDGE COSTS**
With the reduction of sludge weight disposal and with the reduction of transportation costs
- **NO PLANT MODIFICATION**
In the wastewater treatment plants no modifications are necessary, thanks to its specific shape (naval container), which is similar to the current boxes used to store sludge
- **ONLY 20 FT NAVAL CONTAINER**
The smallest sludge dryer. The compact shape is the result of high performances in the drying process and efficiency
- **20% HIGHER EFFICIENCY**
The heat recovery, combined with the perfect fluid dynamic process, allows achieving the best performances compared to competitors
- **1 KTON/YEAR WET SLUDGE TREATED**
High scalability of each module to solve all the dry needs. DryWa modules can be stacked, treating up to 3 Kton/year in only 15 m²
- **FASTER EVAPORATION BY AN INNOVATIVE TURNING ROLLER**
Higher water evaporation from sludge thanks to a specific turning roller able to break and turn the dry sludge crust
- **SELF CLEANING SYSTEM**
To achieve always the best performances with non-stop operations and no need of external maintenance
- **WATER AND AMMONIA EXTRACTION**
The ammonia could be extracted from the sludge, producing ammonium sulphate for chemical industries
- **69% WEIGHT REDUCTION WITH DRY PROCESS**
Strong weight reduction only with dry process. The dry sludge is perfect as fertilizer
- **93% WEIGHT REDUCTION WITH BURN PROCESS**
Possibility to use ashes as raw material in the cement factories
- **FLEXIBLE TREATMENT**
DryWa recognizes automatically the sludge characteristics and it is self-regulating to achieve always the best performances
- **EASY ICT MANAGEMENT**
A special software has been developed for all the devices (pc, tablet, smart phone, etc.) to monitor and manage DryWa remotely as locally, recording all the main data for your report
- **FOCUS ON YOU**
All performing data are continually sent to Solwa offices to optimize the machine to your needs and give you the best customer assistance as well as provide you with spare parts