Industrial Water Evaporators

HIGH-EFFICIENCY
ADVANCED VACUUM EVAPORATORS CONCENTRATORS

VALORISATION OF DIGESTATE

FROM METHANATION PROCESSES THROUGH ADVANCED EVAPORATION AND CONCENTRATION PLANTS.

Ideal solution for achieving:

*High **reduction of digestate** volumes for spreading*

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*High **reduction in agricultural areas** required for spreading*

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*Highly **reduced transport and disposal costs***

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***Valorisation of digestate** and nutrients*

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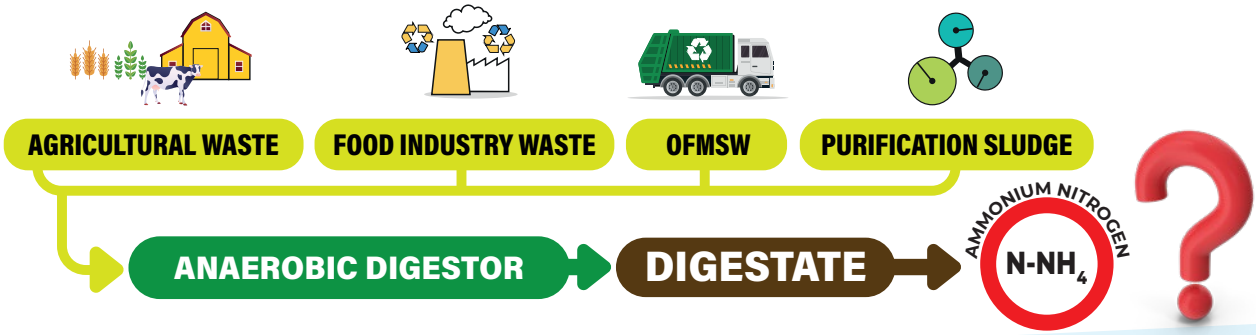
***Removal of ammoniacal nitrogen** from digestate*

A PROBLEM TO BE SOLVED: THE NITROGEN LOAD IN THE DIGESTATE.

Digestate produced by the anaerobic treatment of agricultural biomass, livestock manure and the collection of the Organic Fraction of Municipal Solid Waste (OFMSW) **has a high load of organic and ammonium nitrogen.**

The European Directive restricts the spreading of these substances, which are considered high concentration pollutants, on the soil.

Without a sufficient size of land on which to distribute the digestate, **it is therefore necessary to carry out nitrogen removal treatment in order to reuse the treated water for agronomic purposes.**

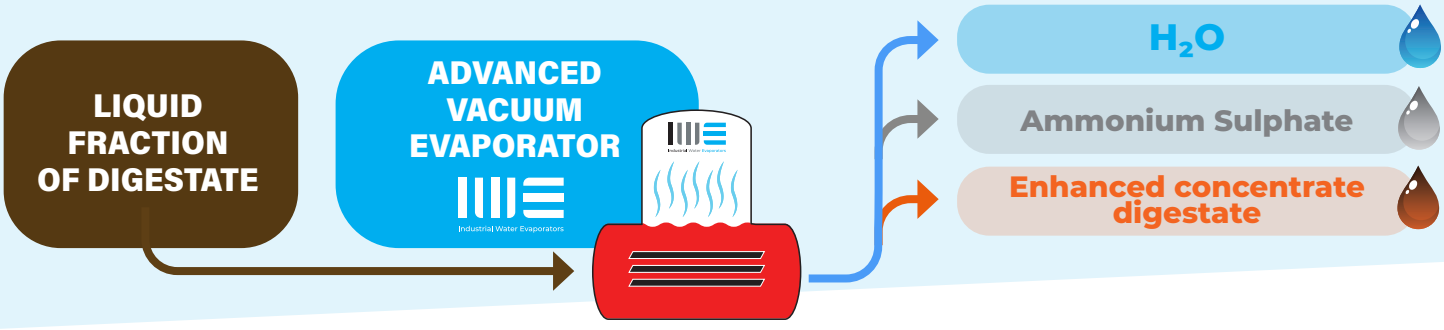


THE SOLUTION: IWE ADVANCED VACUUM EVAPORATORS.

The multi-stage treatment allows not only the recycling of water, but also **the recovery of by-products, which can be used as fertilisers or soil conditioners, and the production of a sanitised and stabilised compost.**

The process starts with a centrifuge separation treatment to remove suspended solids, followed by dosing of sulphuric acid to salify the ammonia and **retain it in the concentrate as ammonium sulphate.**

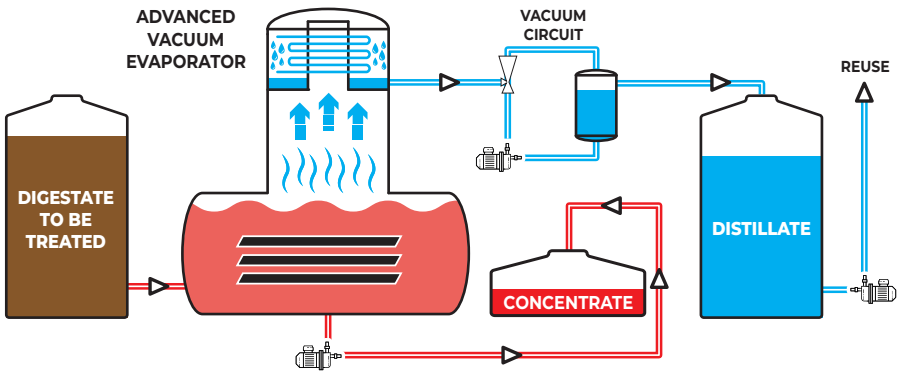
The acidified liquid fraction is then treated with an advanced energy efficient thermal vacuum evaporator.



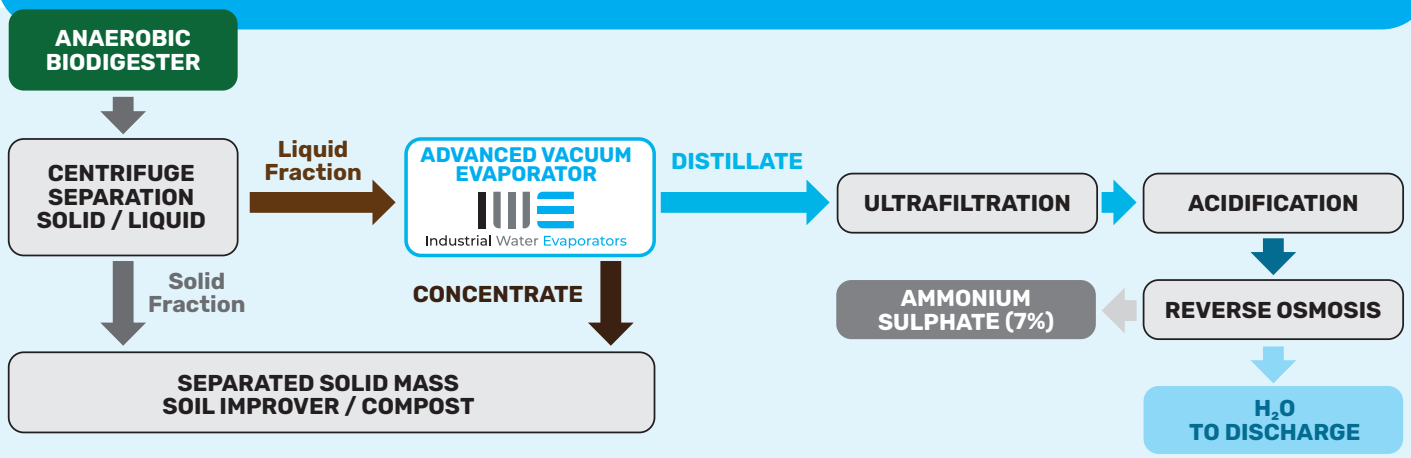
KEY FACTOR

Evaporation is the **change of state from a liquid to an aeriform state which, in the presence of a vacuum, takes place at a lower temperature than the boiling temperature at atmospheric pressure,** thus making it possible to benefit from considerable energy savings, especially in the two- or three-stage versions.

PROCESS SCHEME



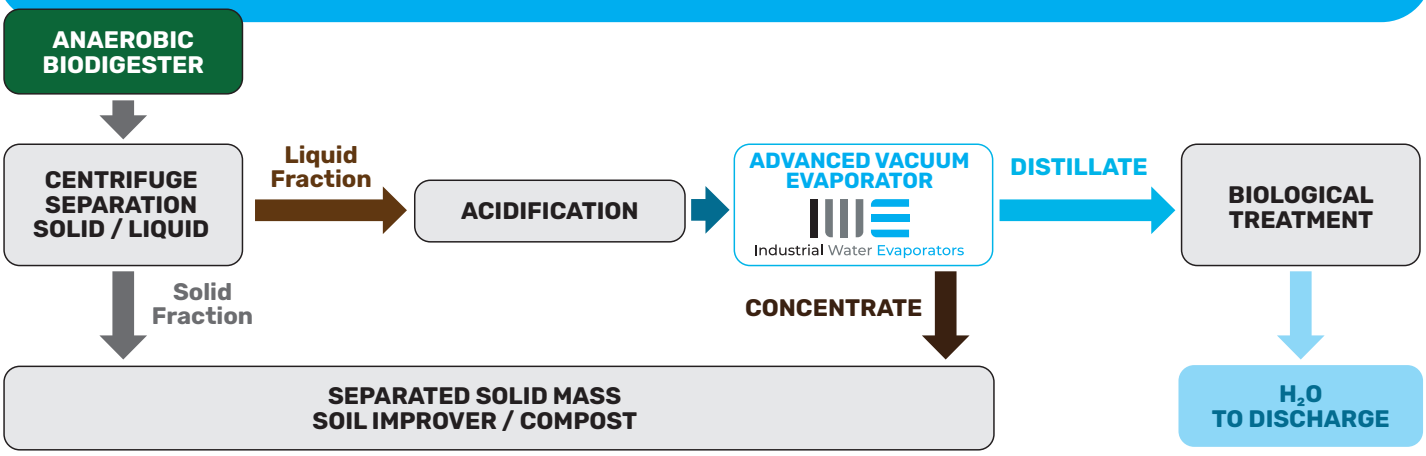
SCHEME "A": TREATMENT OF RAW DIGESTATE



RESULT OF A CASE-STUDY (SCHEME "A")

STATE	VOLUME (mc/giorno)	SOLID SUBSTANCE (%)	pH	AMMONIA g/mc	PHOSPHATES g/mc	COD mg/l O_2
DIGESTATE	100	5	8,20	3.400	105	38.000
DISTILLATE	75	< 0,1	9,50	2.950	< 0,1	130
CONCENTRATE	25	20	8,80	450	420	145.000

SCHEME "B": TREATMENT OF DIGESTATE AFTER ACIDIFICATION



RESULT OF A CASE-STUDY (SCHEME "B")

STATE	VOLUME (mc/giorno)	SOLID SUBSTANCE (%)	pH	AMMONIA g/mc	PHOSPHATES g/mc	COD mg/l O_2
DIGESTATE	100	5	8,20	3.400	105	38.000
DISTILLATE	75	< 0,1	8,55	65	< 0,1	160
CONCENTRATE	25	20	6,10	10.500 (ammonium sulphate)	420	162.000

THE ADVANTAGES OF OUR ADVANCED EVAPORATORS

HIGH RESISTANCE TO CHEMICALS

EXCLUSIVE SYSTEM FOR AUTOMATIC CLEANING

INNOVATIVE HEAT EXCHANGERS

EASY OPENING SYSTEM

STANDARD HEAT-EXCHANGERS

Tube bundle - Immersed coil

IWE HEAT-EXCHANGERS

INNOVATIVE "IMMERSED PLATES"

HEAT EXCHANGERS WITH FULLY AUTOMATIC CLEANING SYSTEM

ELECTRIC ENERGY

Heat Pump

Vacuum evaporation plants with ***exclusively electrical power supply.***

TREATMENT CAPACITY

from 5 to 4.000 l/h
(from 120 to 100.000 l/day)

ENERGY REQUIREMENTS

SINGLE EFFECT	DOUBLE EFFECT
160 W/l	**100 W/l**

THERMAL ENERGY

Hot Water / Steam

Vacuum evaporation plants with ***hot water or steam supply (also from heat recovery or cogenerators).***

TREATMENT CAPACITY

from 100 to 15.000 l/h
(from 2.400 to 360.000 l/day)

ENERGY REQUIREMENTS

SINGLE EFFECT	DOUBLE EFFECT	TRIPLE EFFECT
600 Kcal/l	**300 Kcal/l**	**200 Kcal/l**

Designs can be made to measure, and are also available in carterized versions for outdoor installation.

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