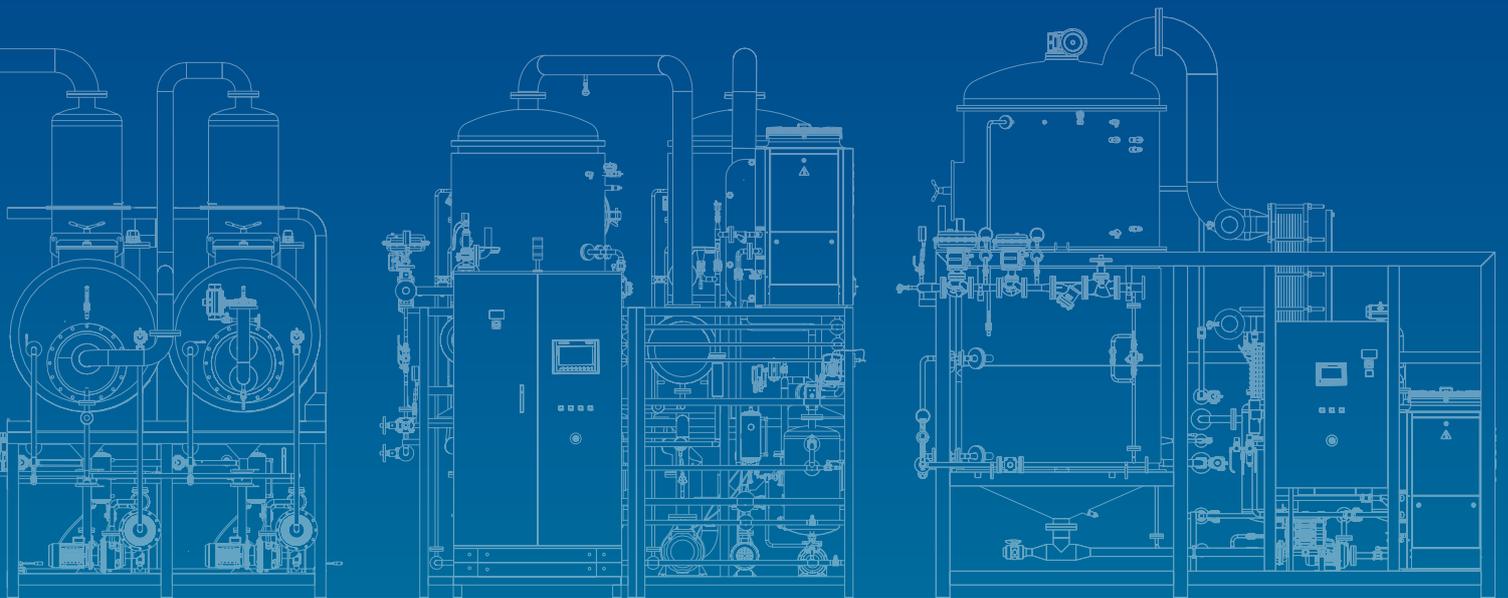




ZLD technology. Sustainable. Customized.  
Vacuum evaporators and concentrators



# Eco-Techno

## Market leader in thermal evaporation

**Since 1984 we - family-owned ECO-Techno - have been producing high-quality industrial wastewater treatment solutions. We are recognized as a specialist in wastewater treatment plants worldwide.**

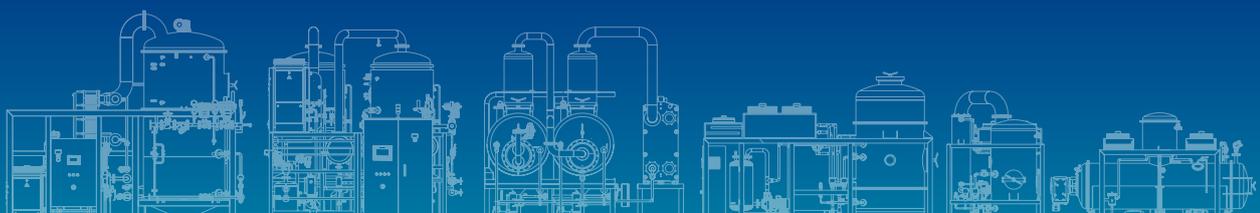
No manufacturer of vacuum evaporators has more experience than ECO-Techno. More than 3,100 "Made in Italy" plants make wastewater free processes possible for leading industrial companies in a wide range of applications.

Wastewater is a valuable resource: both as reusable clean process water and for the recovery of valuable raw materials.

We are your partner for customized solutions for the treatment of industrial wastewater. Our core competence includes vacuum evaporators for the use of existing thermal energy.

Full service around the plant engineering: We take over the planning, delivery and start-up of your plant and ensure remote maintenance during its operation.

**Meeting your own individual need is our goal!**



# Satisfied customers worldwide: Application examples



INDUSTRY	APPLICATION
<b>MECHANIC AND STEEL INDUSTRY</b>	Oil emulsions, vibratory finishing, cleaning baths, acids
<b>ALUMINIUM SURFACE TREATMENT / ALUMINIUM COATING</b>	Wastewater from polishing, chroming, anodizing, pickling, painting, cleaning waters
<b>PLATING AND GALVANIZING</b>	Metals recovery (chromium, nickel, copper) of spent baths, backwash of resins, salt crystallization
<b>ZLD</b>	Power plant, RO (reverse osmosis) reject, desulphuration water, backwash of resins, concentrate from MVC evaporator, digestate, livestock wastewater
<b>HEAT TREATMENTS</b>	Quenching and tempering salts
<b>PHARMACEUTICAL, CHEMICAL</b>	Cleaning process, heat-labile solutions
<b>FOOD AND BEVERAGES</b>	Cleaning water, recovery and concentration of sugar solution, brine, enzyme concentration, enrichment of grape must, flavourings
<b>COSMETIC AND PLANT EXTRACTS</b>	Concentration of extracts, concentration of alcohol-based solutions, cleaning waters
<b>DISPOSAL CONTRACTORS, LANDFILL LEACHATE</b>	RO (reverse osmosis) reject, leachate, brine, combined wastewater
<b>PRINTING INDUSTRY</b>	Ink-polluted water, cleaning printing cylinders, developing and fixing baths exhausted, engraving and chrome cylinders, grinding processes, processes of coloring

# The perfect solution for every process

## Our product range



**Multi Effect vacuum evaporators**  
Externally heated - energy recycling for minimal operating costs



**Low temperature evaporators (heat pump)**  
Approved, versatile, simple



**Cristallisators**  
Recycling of salts, sludge and more



Behind our vacuum evaporators is an innovative and efficient technology for the treatment of industrial process water.

Highly automated and with the option of online monitoring.

Our plants combine economy, ecology and technology to create a perfect synthesis.

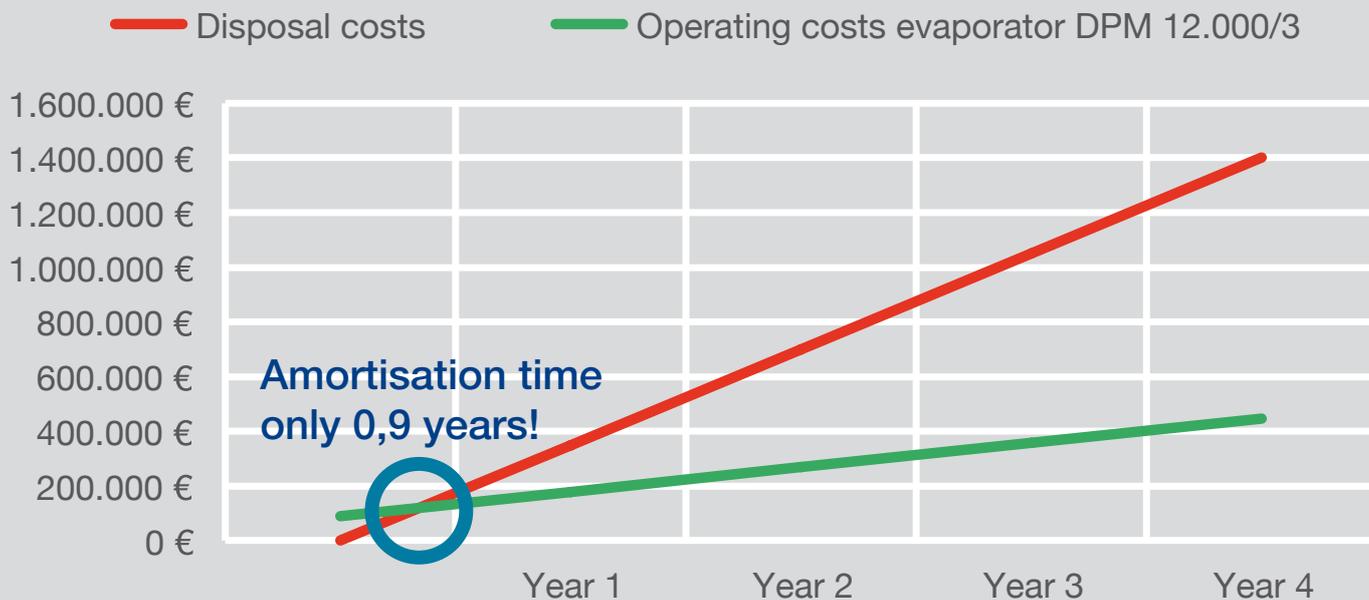
# Your investment in an evaporator system Effluent free technology saves money!

## Our vacuum evaporators are durable and efficient.

Many of our 3,100+ systems installed run for more than 15 years.

In the long term your company benefits from high profitability and the environment from wastewater-free production processes.

The calculation example on the left shows an externally heated plant that treats 4,000 cubic meters of wastewater per year. In 10 years, this system can save more than 2.6 million euros!



ECO-Techno  
**Durable. Reliable. Customized.**

# Submerged Heat exchanger. DISTILLATION THROUGHPUT 10 to 105 l/h HEAT PUMP LT VACUUM EVAPORATOR



## ECO DPE HP

Easy in installation, made to efficiently treat water-based-solutions from 10 to 105 l/h at low temperature (35°C) to recycle water and raw materials or meet discharge limits. The DPE-HP can be completely custom-made in accordance to the specific treatment necessity.

## ECO DPC HP

Derived from ECO DPE HP series, it is configured for the direct treatment of chromic solutions. Made in Titanium and acid-resistant resins.

## MAIN APPLICATIONS

ECO DPE and DPC HP specially configured for industrial applications like:

oil emulsions and release agents from die-casting

quenching from heat treatments

baths from galvanizing

foamy liquids

treatment of water-based solutions

## MAIN FEATURES

Boiling vessel in A-316/316L. Completely detachable, easy access through man-hole and sight glass with illuminator.

Submerged heat exchanger.

Side cooling section for condensation in closed loop.

Heat pump designed for low-temperature evaporation with compressor. Ecological Freon gas type R407c or R134a.

Vacuum circuit with pump.

Automatic product inlet with modulating valve.

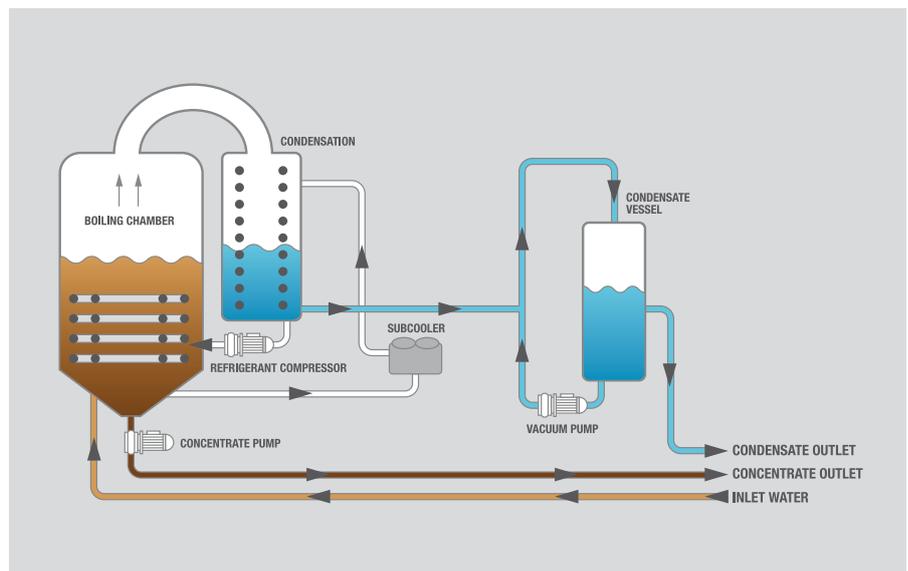
Automatic concentrate discharge

Defoamer dosage circuit with foam sensors.

Automatic cleaning with water or chemicals.

Comprehensive Control System with Siemens PLC and touchscreen

## FLOW DIAGRAM



# SUBMERGED HEAT EXCHANGER. DISTILLATION THROUGHPUT 10 to 750 l/h HEAT PUMP LT VACUUM EVAPORATOR

## ECO VS HP

Easy in installation, made to efficiently treat water-based solutions from 10 to 750 l/h at low temperature (35°C) to recycle water and raw materials or meet discharge limits. The VS-HP can be custom-made in accordance to the specific treatment necessity.

## ECO CR HP

Derived from ECO VS-HP series, it is configured for the direct treatment of chromic solutions from 10 to 750 l/h. Made in Titanium and acid-resistant resins.



## MAIN FEATURES

Boiling vessel in A-316/316L. Completely detachable, easy access through man-hole and sight glass with illuminator.

Submerged heat exchanger. The heat exchanger can be completely removed for easy maintenance.

Upper heat exchanger for the condensation of vapour.

Heat pump designed for low-temperature evaporation with compressor. Ecological Freon gas type R407c or R134a.

Vacuum circuit with pump.

Automatic product inlet with modulating valve.

Automatic concentrate discharge with pump from vacuum.

Defoamer dosage circuit with foam sensors.

Automatic cleaning with water or chemicals.

Comprehensive Control System with Siemens PLC and touchscreen.

## MAIN APPLICATIONS

ECO VS and CR HP specially configured for industrial applications like:

die-casting

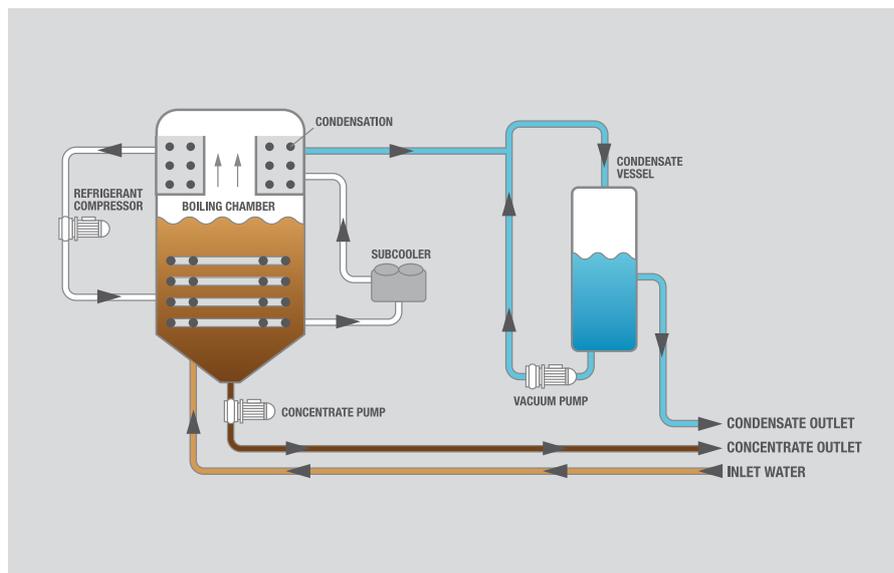
quenching

pharmaceutical and chemistry

food & beverage

and in general hazardous wastewater

## FLOW DIAGRAM



# DOUBLE EFFECT EVAPORATOR. DISTILLATION THROUGHPUT 10 to 2500 l/h HEAT PUMP LT VACUUM EVAPORATOR



## ECO DE HP

Multiple Effect Heat Pump Evaporator. It is the combination of the heat pump systems with the energy-saving typical of the “multiple effect” evaporators. It uses only electrical energy as power and exploits the thermal energy of vapour produced in the first boiler to heat the subsequent one.

## MAIN APPLICATIONS

ECO OC HP evaporators suitable for the treatment of large flow rate of wastewater, where alternative energy sources are not available.

die-casting

quenching

pharmaceutical and chemistry

food & beverage

and in general hazardous wastewater

## MAIN FEATURES

Multiple boiling vessels in A-316/316L or special alloy.

Submerged heat exchanger in the first vessel. The vapour produced is used to heat a second tube bundle heat exchanger.

Condensation of vapour in closed circuit.

Heat pump circuit designed for multiple effect low- temperature vacuum concentrators. Ecological Freon gas type R407c or R134a.

Vacuum circuit with pump.

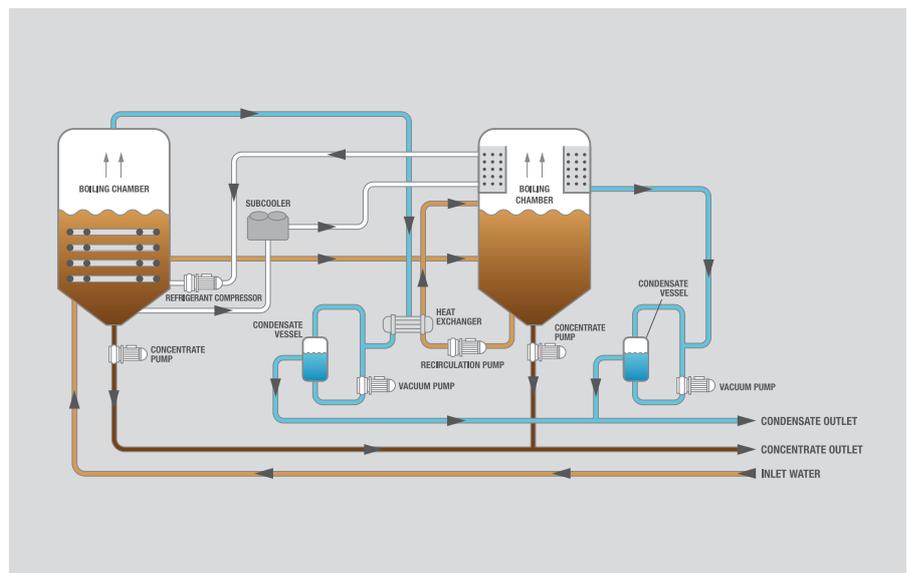
Automatic concentrate discharge with pumps from vacuum.

Defoamer dosage circuit with foam sensors.

Automatic cleaning with water or chemicals.

Comprehensive Control System with Siemens PLC and touchscreen.

## FLOW DIAGRAM



# WITH SCRAPER FOR ENCRUSTING LIQUIDS. DISTILLATION THROUGHPUT 20 to 125 l/h HEAT PUMP LT VACUUM EVAPORATOR

## FOR SEVERE CONCENTRATION

### ECO VR HP

Specially configured to concentrate encrusting water-based solutions from 20 to 125 l/h, it has an internal scraper to concentrate up to crystallization.

Specially recommended for fouling wastewater and high density watery solution treatment.



### MAIN FEATURES

Boiling vessel in A-316/316L or special alloy.

Internal scraper controlled by gear motor to clean fouling and to improve the concentration degree

Jacketed heat exchanger (not in contact with the influent).

Upper heat exchanger for the condensation of vapour

Heat pump circuit designed for low-temperature evaporation with compressor. Ecological Freon gas type R407c or R134a.

Vacuum circuit with pump.

Automatic product inlet with modulating valve.

Automatic concentrate discharge with valve or pump.

Defoamer dosage circuit with foam sensors and automatic injection.

Comprehensive Control System with Siemens PLC and touchscreen.



### MAIN APPLICATIONS

ECO VR HP specially configured for industrial applications like:

glue and encrusting streams

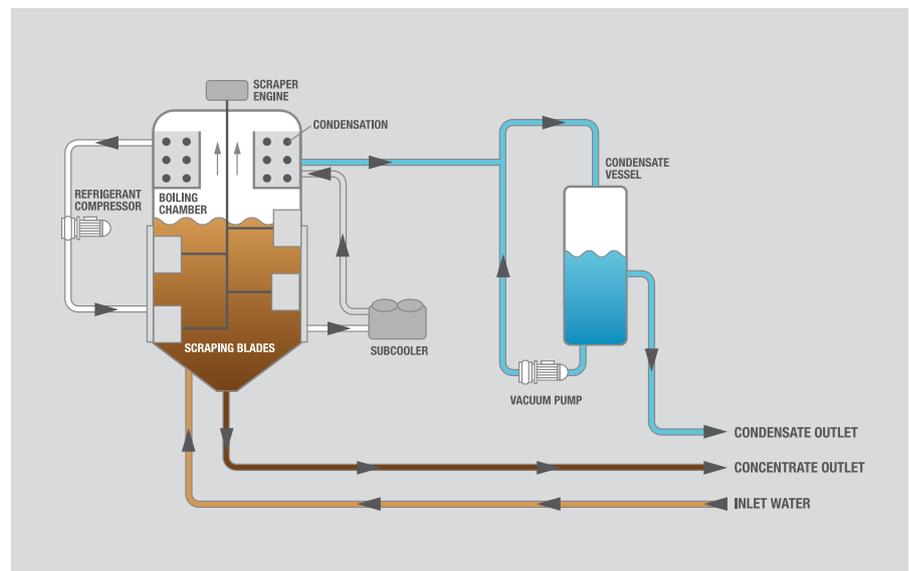
printing industry

RO rejects

Brine and brackish water

ZLD

### FLOW DIAGRAM



# WITH SADDLE JACKETED HEAT EXCHANGER. DISTILLATION THROUGHPUT 10 to 42 l/h HEAT PUMP LT VACUUM EVAPORATOR

**FOR SEVERE CONCENTRATION WITH DRY AND SUPER-DRY FUNCTION**



## ECO DRY HP

ECO DRY HP series evaporators are designed to obtain sludge, as well as the recovery of raw materials dissolved in the waste.

Version with scraping screw for semi-solid concentrate.



## MAIN FEATURES

Horizontal boiling vessel built in A-316/316L or special alloy

Side opening and full accessibility for manual removal of salts. At completion of the work cycle, vacuum is broken and manual download of the boiler starts, by using a scraper shovel (manual or automatic)

Saddle jacketed heat exchanger not in contact with the influent.

Upper heat exchanger for the condensation of vapour

Heat pump circuit designed for low-temperature evaporation with compressor. Ecological Freon gas type R407c or R134a.

Vacuum circuit with vacuum pump.

Automatic product inlet with modulating valve.

Defoamer dosage circuit with foam sensors.

Comprehensive Control System with Siemens PLC and touchscreen.

## MAIN APPLICATIONS

ECO DRY HP evaporators designed to:

ZLD

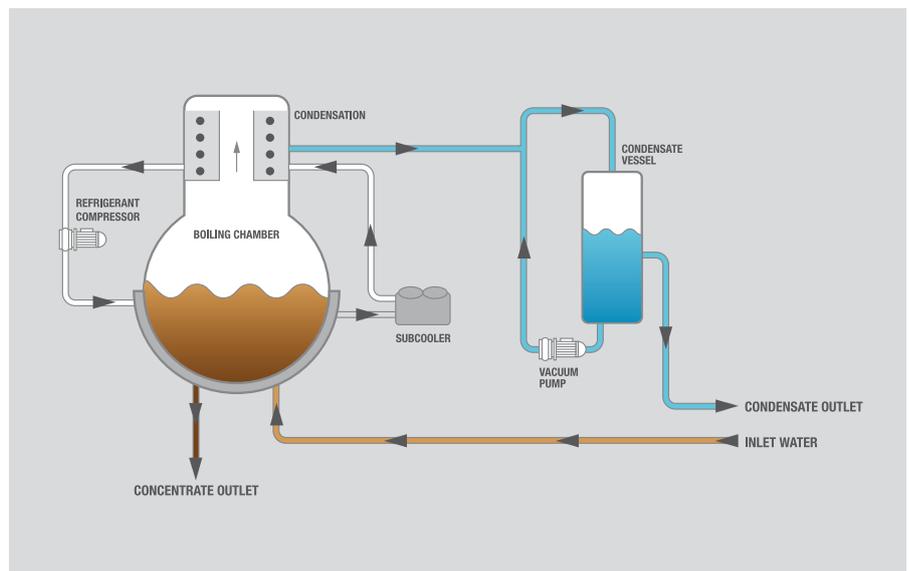
severe concentration process

recycle of salts

recycle of metals

concentration of plant extracts and flavourings

## FLOW DIAGRAM



# FORCED CIRCULATION EVAPORATOR. DISTILLATION THROUGHPUT 30 to 5000 l/h MECHANICAL VAPOUR COMPRESSION

## ECO CMV SE

The ECO CMV or MVC - forced circulation evaporator based on the mechanical compression of vapour to optimize heat exchange and low energy consumption.

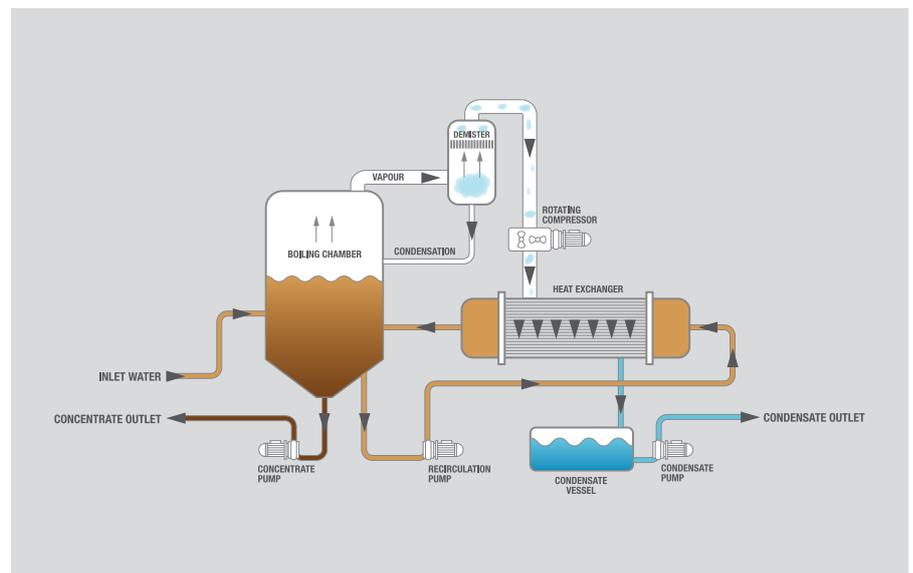


## MAIN APPLICATIONS

ECO CMV SE evaporators are suitable for the treatment of:

- Oil emulsions
- Spent release agents from die-casting
- vibratory finishing
- Pre-treatment for painting industry

## FLOW DIAGRAM



## MAIN FEATURES

- Mechanical vapour compression evaporator.
- Forced circulation.
- Low energy consumption.
- Wastewater inlet and condensate outlet automated.
- Control by Siemens PLC and touch-screen.

# FOR THERMAL ENERGY WITH SCRAPER, DISTILLATION THROUGHPUT 30 to 500 l/h VACUUM EVAPORATOR

## FOR SEVERE CONCENTRATION AND ENCRUSTING LIQUIDS



### ECO VR-WW

The ECO VR-WW vacuum evaporators are designed for the treatment and recovery of fouling and encrusting water-based solutions.

Recommended for the treatment of high-density sludge and ZLD.

### MAIN APPLICATIONS

ECO VR WW specially designed for:

glue and encrusting streams

Printing industry

Brine and brackish water

wastewater treatment printing

Pharmaceutical & Chemical industry

RO rejects

ZLD



### MAIN FEATURES

Single or multiple boiling vessels in A-316/316L or special alloys.

Internal scraper controlled by gear motor to clean fouling and to improve the concentration degree.

Jacketed heat exchanger not in contact with the influent

Condensation with plate heat exchanger.

Vacuum circuit in with pump.

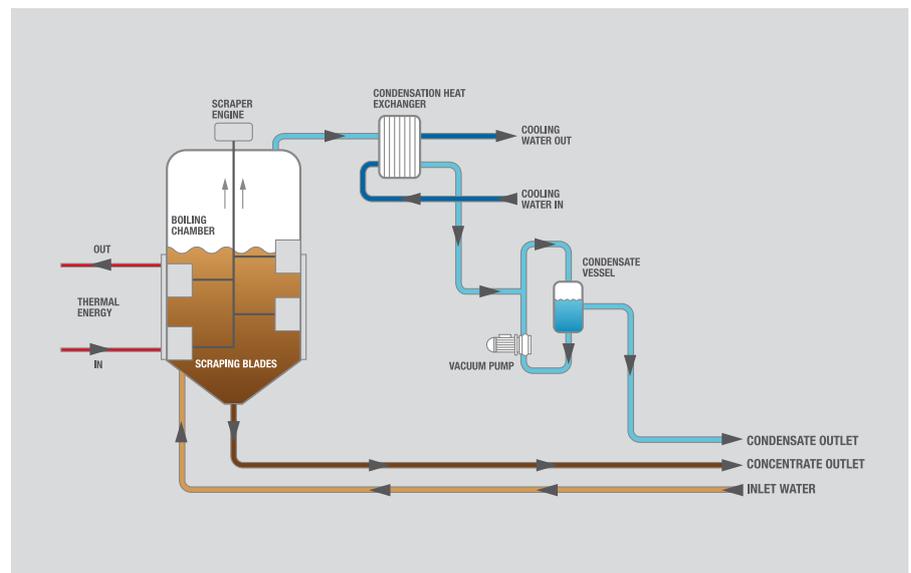
Automatic product inlet with modulating valves.

Automatic concentrate discharge with pumps.

Defoamer dosage circuit with foam sensors and automatic injection system.

Comprehensive Control System with Siemens PLC and touchscreen.

### FLOW DIAGRAM



# SUBMERSED HEAT EXCHANGER. DISTILLATION THROUGHPUT 165 to 1250 l/h MULTIPLE EFFECT VACUUM EVAPORATORS

## ECO DPM

The vacuum evaporators ECO DPM are designed for efficiently treating middle to large flow rates by using any thermal source as power, and recycling the produced energy. Specially configured for hazardous wastewater, they are anytime no maintenance is required.

Single or multiple effect configuration is possible. Condensation with cooling tower or plate exchanger possible.



## MAIN APPLICATIONS

ECO DPM evaporators are particularly suitable for:

Oil emulsions and release agents from die-casting

Mechanic industry

Vibratory finishing

Leachate

RO rejects

Printing industry

Spinning and weaving

Lebensmittel

## MAIN FEATURES

Single or multiple boiling vessels in A316/316L or special alloys, full accessible.

Bundle heat exchangers removable by flange for a user-friendly maintenance.

Condensation with plate heat exchanger or wet-bulb cooling tower.

Vacuum circuit with pumps.

Automatic product inlet with modulating valves.

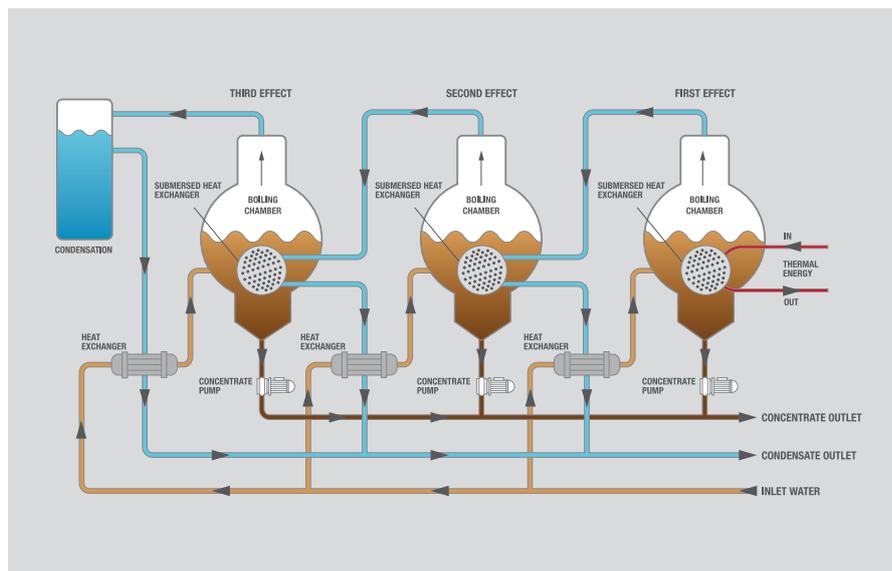
Automatic concentrate discharge with pumps from vacuum.

Defoamer dosage circuit with foam sensors.

Automatic cleaning circuit.

Comprehensive Control System with Siemens PLC and touchscreen.

## FLOW DIAGRAM



# THERMAL EVAPORATION WITH FORCED CIRCULATION. DISTILLATION THROUGHPUT 416 to 8000 l/h MULTIPLE EFFECT VACUUM EVAPORATORS



## ECO DPM SE

The vacuum evaporators of the series DPM SE are designed for the concentration of large volumes of water based solutions and high salt concentration solutions. Powered by thermal sources like hot water or steam. Single or multiple effect.

Designed to meet the severe treatment conditions of disposal contractors with a number of varied hazardous wastewater.

## MAIN APPLICATIONS

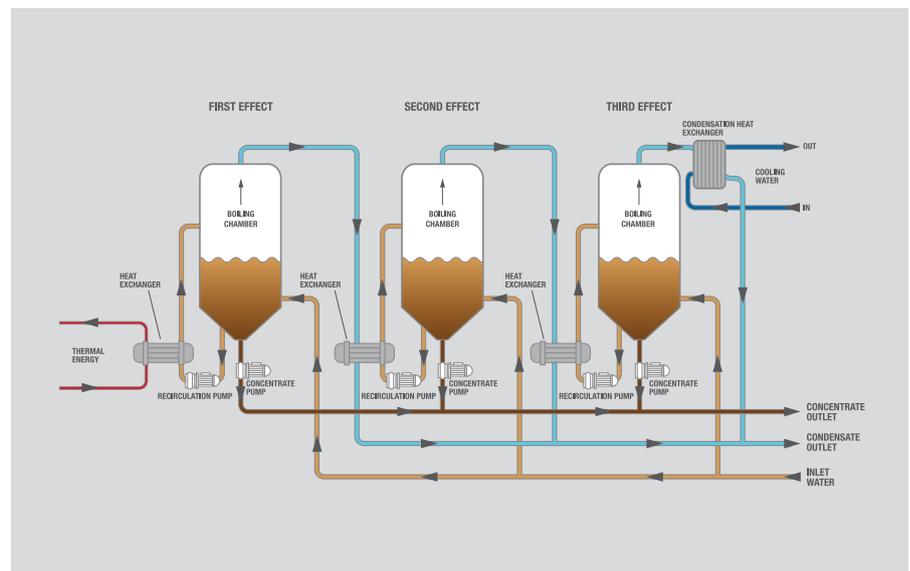
ECO DPM SE evaporators are particularly suitable for:

- Waste disposal companies
- Hazardous wastewater
- Leachate
- Salty water

## MAIN FEATURES

- Single or multiple boiling vessels in A-316/316L or special alloys
- Maintenance-friendly external bundle heat exchangers
- Condensation with plate heat exchanger
- Vacuum circuit in with pumps
- Automatic product inlet with modulating valves and transferring pumps
- High-speed forced circulation of the influent with pumps
- Automatic concentrate discharge with pumps from vacuum.
- Antifoam circuit with foam-detector and automatic injection system.
- Cleaning circuit for the automatic cleaning of the plant with water or chemicals.
- Comprehensive Control System with Siemens PLC and touchscreen.

## FLOW DIAGRAM



# Materials

We use high-quality austenitic super-duplex stainless steels for use in highly corrosive conditions. These materials offer outstanding resistance. We offer a wide range of material variants:

## 1.4401 and 1.4404 Stainless Steel AISI316/316L

18/8 austenitic stainless steel enhanced with an addition of 2.5% Molybdenum, to provide superior corrosion resistance. 316/316L has improved pitting corrosion resistance and has excellent resistance to sulphates, phosphates and other salts.

316/316L has a better resistance than standard 18/8 types to sea water, reducing acids and solution of chlorides, bromides and iodides.

## 1.4563 SANICRO 28 Sandvik

High-alloy multi-purpose austenitic stainless steel for service in highly corrosive conditions. The grade is characterized by:

- Very high corrosion resistance in strong acids
- Very good resistance to stress corrosion cracking (SCC) and intergranular corrosion in various environments
- High resistance to pitting and crevice corrosion
- Good weldability

## 1.4410 SAF 2507 TM Sandvik

Super-duplex (austenitic-ferritic) stainless steel for service in highly corrosive conditions. This grade is characterized by:

- Excellent resistance to stress corrosion cracking (SCC) in chloride-bearing environments
- Excellent resistance to pitting and crevice corrosion
- High resistance to general corrosion
- Very high mechanical strength
- Physical properties that offer design advantages
- High resistance to erosion corrosion and corrosion fatigue
- Good weldability

## Titanium

Suitable for applications on corrosive wastewater, such as chromic acid.

## Hastelloy

Nickel-based alloy, with high resistance to acid chloride, aluminium chloride and strong reducing agents in general.

## Silicon Carbide

Synthetic material with high chemical resistance.

## Incolloy

Nickel-based alloy, resist-

ant to oxidation at high temperatures.

## Nickel-Alloy

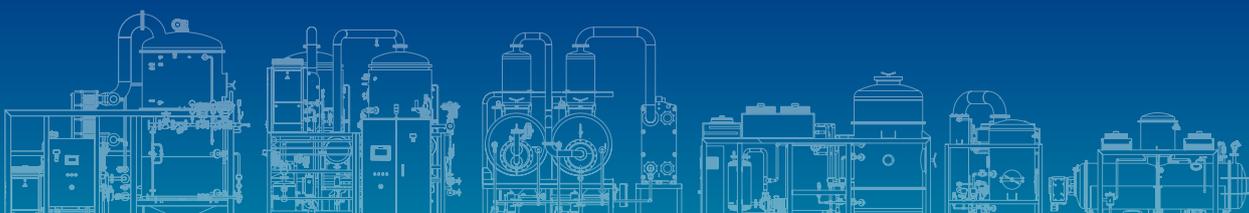
Low carbon steel.

# Our Services

ECO-Techno provides pilot plants, lab test etc. for pre-sales analysis in order to find the best process solution.

We ensure trouble-free operation of your system through a high-quality service. The average life expectancy of our systems is a proud 17 years, many customers could even reach significantly longer operating times through service contracts with us.

Pilot plants	Laboratory tests
Installation & Commissioning	Maintenance
Training	Online monitoring and TeleService
Process checks	





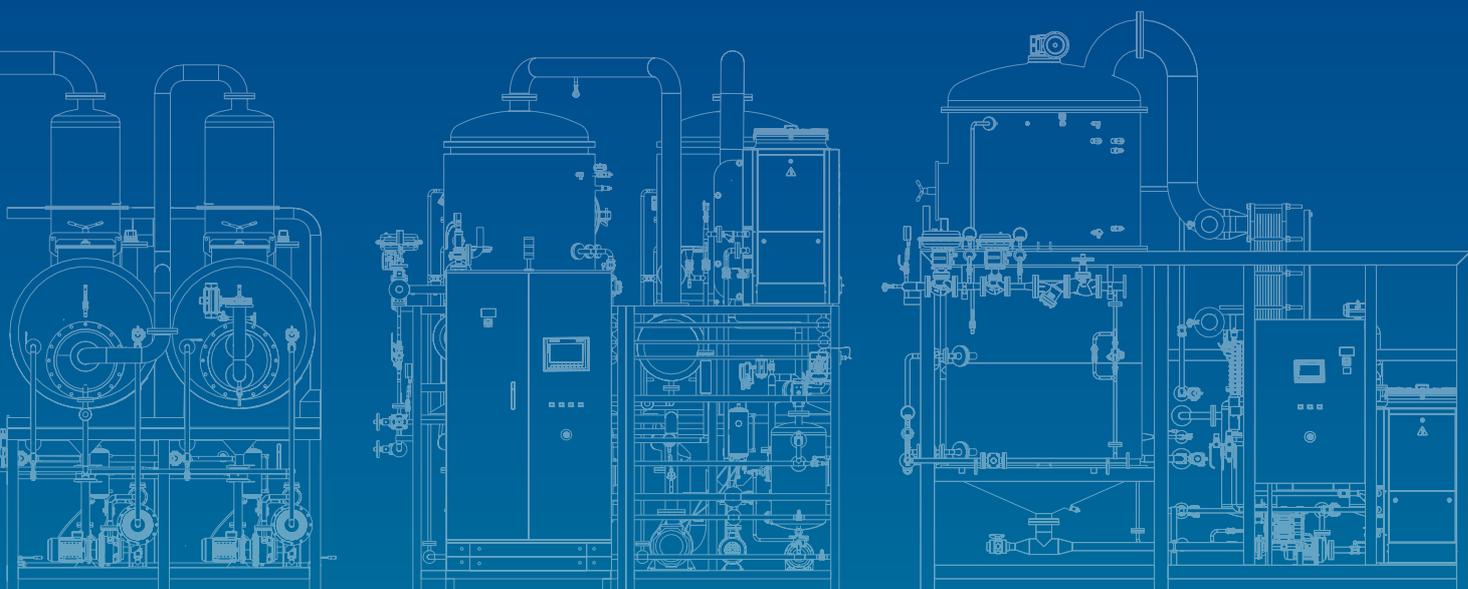
## Vacuum Evaporators and Concentrators since 1984

### **ECO-TECHNO srl con socio unico**

Via del Lavoro, 42 - 20874 Busnago (MB) - Italia

Tel. +39 039 6095958 - Fax +39 039 6820584

**[www.eco-techno.it](http://www.eco-techno.it) - e-mail: [info@eco-techno.it](mailto:info@eco-techno.it)**



This brochure shows models, outfitting versions and configuration possibilities (standard and optional) of vacuum evaporation systems for industrial applications, manufactured and distributed by ECO-TECHNO.

The content is intended for general information purpose only. The details it contains shall not be deemed a contractually binding document, since ECO-TECHNO may make constructive and outfitting modifications anytime and during the period between publication of this catalogue, the manufacturing of the equipment and the publication of an update catalogue.