

MONO AND MULTI-EFFECT VACUUM EVAPORATORS EVHW Series

Single, double or triple stage evaporation systems. High volumes of wastewater can be treated with low energy consumption. The heating source for distillation is provided by hot water or steam while cold or chilled water in a closed circuit is used for vapor condensation. The mono-effect evaporator (single stage) has only one boiler and distillation takes place under vacuum at **low temperature** (< 50°C).

Multi-effect evaporators, on the other hand, rely on **decreasing temperature and pressure distillation** in order to optimize energy efficiency. The first stage uses an external energy source (hot water or steam) for effluent evaporation while each of the subsequent stages use the steam generated by the previous stage as a heating source. The double-effect generates **50% energy saving** as compared to a **66%** with the triple effect process.

Specifications

In multi-effect evaporators with **forced circulation**, the vertical boiler has an external **shell and tube heat exchanger** whereas **natural circulation** evaporators have an horizontal boiler with immersed heat exchanger. Forced circulation is the preferred application to treat potentially encrusting liquids. To improve

energy efficiency, there are some pre-heating heat exchangers to harness the thermal energy generated by the process itself. Mono and multi-effect evaporators are fully automated systems featuring process instrumentation to control: temperature, vacuum, distilled water quality and density of discharged liquid concentrate.

Advantages

- High volumes processing
- Low energy consumption
- Potential to treat corrosive liquids
- Continuous operating cycle
- Integration with cogeneration plants

MONO EFFECT	CAPACITY (L/day)	THERMAL ENERGY (Kw-Kcal/h)	INSTALLED kW	DIMENSIONS L x W x H (mm)
EV300HW	7200	210 - 180.000	4	2400 x 1500 x 3400
EV500HW	12000	350 - 300.000	4	3200 x 1800 x 3400
EV700HW	16000	500 - 430.000	4	3200 x 1800 x 3800
DOUBLE EFFECT				
2EV300HW	14400	210 - 180.000	8	3500 x 4500 x 3200
2EV500HW	24000	350 - 300.000	8	3500 x 4500 x 3200
2EV700HW	33000	500 - 430.000	8	4000 x 5000 x 3500
TRIPLE EFFECT				
3EV700HW	50000	500 - 430.000	10	7500 x 5000 x 6500
3EV0100HW	72000	700 - 600.000	10	8000 x 5200 x 6500
3EV1400HW	100000	1000 - 600.000	13	9000 x 5500 x 6500

MECHANICAL VAPOR COMPRESSION EVAPORATORS EVTC Series

Vapor compression evaporators are wastewater treatment plants that are particularly efficient in **recovering thermal energy** for the concentration and distillation processes of liquid wastes. The operating principle is to increase the enthalpy of the vapors generated during evaporation by inducing compression with a rotary blower; the vapors are then used as heating primary fluid for the evaporation process itself. These system are indicated for the treatment of large volumes of wastewater **with minimal energy consumption**.

Specifications

EVTC series evaporation plants are installed on a skid complete with soundproofing panels. They feature a boiler, stainless steel blower, a primary heat exchanger with inverter-controlled recirculation pump and heat recovery exchangers. Electric heating elements are used for pre-heating the wastewater solution to start the evaporation process. An automated cleaning system is provided for the cleaning of heat exchangers and circuits.

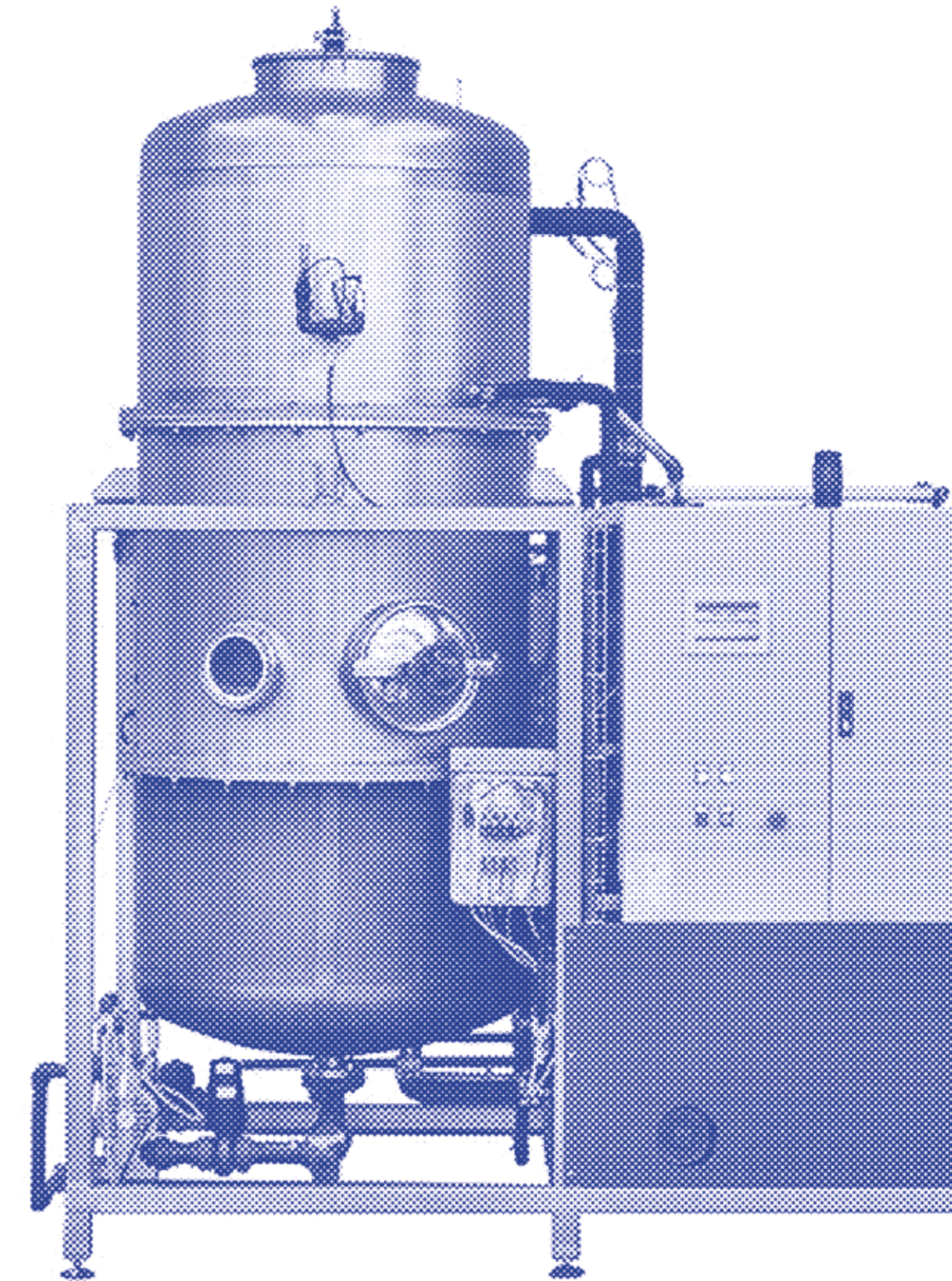
Advantages

- High volumes processing
- Low energy consumption
- Heat recovery
- Continuous operating cycle
- Small footprint
- Industry 4.0 Ready



MODELS	CAPACITY (L/day)	AVERAGE POWER CONSUMED (Wh/lt)	INSTALLED kW	DIMENSIONS L x W x H (mm)
EVTC200	5000	35 - 55	24	4300 x 1800 x 3500
EVTC500	12000	35 - 55	40	4500 x 2000 x 3900
EVTC700	16000	35 - 55	50	4500 x 2000 x 4300
EVTC1000	24000	35 - 55	75	5000 x 2200 x 4800

VACUUM EVAPORATORS WASTEWATER DISTILLATION AND RECYCLE



VACUUM EVAPORATORS

Vacuum evaporators are used to treat industrial wastewater to recover the water contained and reduce the volume of liquid disposals.

The purpose of low temperature distillation is to obtain, with **low energy consumption**, an optimal separation of the water from the pollutants contained in waste solutions recovering more than **90%** of distilled water. SAITA has been producing industrial vacuum evaporators in a variety of sectors for more than thirty years. For the treatment of corrosive liquids, they are built with special materials such as: Titanium, Superduplex, Sanicro28 and internal coating with Halar®.



- > 90% H₂O recovered
- Less disposal costs
- Zero emissions
- 24 h automatic functioning
- Industry 4.0 Ready

Sectors

- Electroplating
- Emulsion and coolants
- Aluminium die casting
- Industrial cleaning
- Powder coating pre-treatment
- Pharmaceutical industry
- Electronics and semiconductors
- Chemical industry
- Liquid waste disposal



1 Distillate > 90%
2 Liquid concentrate < 10%

HEAT PUMP VACUUM EVAPORATORS EV Series

Low-temperature (< 40°C) vacuum evaporators using a **heat pump** with refrigerant gas (freon) as the primary heating and condensing fluid.

Electrically powered, fully automated systems with semi-continuous or batch production cycles.

EV series evaporators are standard and designed with materials suitable for any type of wastewater and therefore the ideal solution for multiple industrial applications.

Specifications

The EV series features a vertical stainless steel or special alloy boiling chamber, the lower part of which is equipped with an immersed coil heat exchanger.

A droplet separator is installed in the upper part of the boiler to separate the steam from the water drops, steam that is then condensed with an

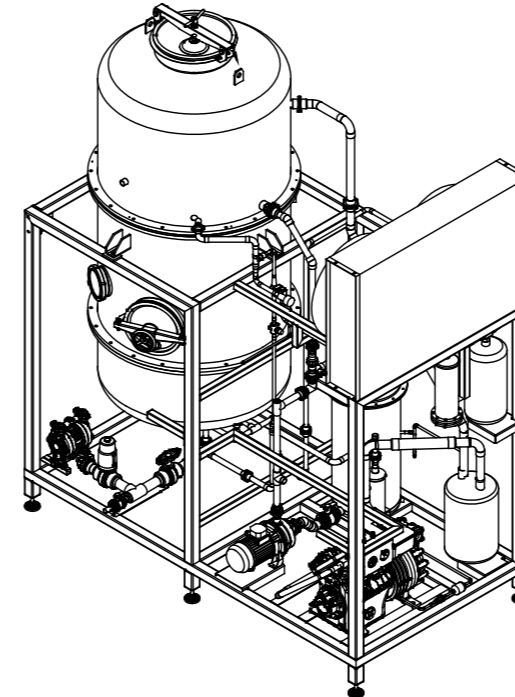
heat exchanger installed in the upper side of the chamber.

The vacuum (-960 mbar) is generated through a closed circuit with **venturi ejector**.

Initial loading, liquid replenishment during the distillation cycle, condensate extraction, and antifoam loading are carried out by the vacuum system.

Advantages

- High-pure distillate
- Recovery >90% of distilled water
- Low boiling temperature <40°C
- Treatment of corrosive liquids
- Low maintenance



MODELS	CAPACITY (L/day)	AVERAGE ELECTRICITY CONSUMED (Wh/t)	INSTALLED kW	DIMENSIONS L x W x H (mm)
EV30	700	150 - 200	10	2200 x 1100 x 2900
EV50	1200	150 - 200	16	2200 x 1100 x 2900
EV100	2400	150 - 200	26	2500 x 1300 x 3000
EV150	3600	150 - 200	45	2500 x 1300 x 3000
EV200	4800	150 - 200	60	2500 x 1300 x 3400
EV300	7000	150 - 200	68	2900 x 1500 x 3600
EV400	9000	150 - 200	85	2900 x 1500 x 3600

VACUUM EVAPORATORS WITH INTERNAL SCRAPER CVD-CVDHW Series

Scraped vacuum evaporators are used to treat highly concentrated waste solutions containing: suspended solids, oils, organic compounds, salts and dissolved metals.

As with the EV series, distillation takes place under vacuum at **low temperature** and the boiling chamber is equipped with an internal scraper to mix the

solution and ensure heat exchange efficiency.

With the scraper system it is possible to achieve high concentration ratios and in some cases a semi-solid sludge waste.

CVD series evaporators are powered by a **heat pump** while the **CVDHW** series by **hot water** (or steam) and **cold water**.

Specifications

In the **CVD** and **CVDHW** series, the boiler is horizontal and equipped with an external heating jacket through which the primary heating fluid passes.

A scraper shaft complete with proximity brushes that keep the heat exchange surface clean is installed inside the boiler. The boiler also features a side door for the inspection and internal cleaning. Vacuum for low-temperature distillation is generated by a closed circuit with venturi ejector.

Advantages

- High concentration ratios
- Treatment of concentrated solutions
- Internal cleaning system with scraper
- Low boiling temperature <40°C
- Low maintenance



MODELS	CAPACITY (L/day)	AVERAGE POWER CONSUMED (Wh/t)	INSTALLED kW	DIMENSIONS L x W x H (mm)
CVD15	350	160 - 210	8	1800 x 1200 x 2400
CVD30	700	160 - 210	10	2800 x 1500 x 2400
CVD50	1200	160 - 210	16	2900 x 1700 x 2400
CVD100	2400	160 - 210	26	3500 x 2000 x 3200