AQUADEST

vacuum evaporators

www.aquadest.cz/en

Use of vacuum evaporators:

- chemical industry
- surface treatment
- metallurgy
- mechanical engineering
- food industry
- pharmaceutical industry
- photographic industry
- landfills

Solution for:

- rinse water
- landfill leachate
- waste water from tumbling
- waste water from die casting
- baths from surface treatment
- machining and other emulsions
- exhausted developers and fixing agents
- concentrates from membrane separation processes
- washing water from reactors, mixers and tanks
- eluates from ion exchanger regenerations

Vacuum evaporation

Vacuum evaporation is used to increase concentration of substances dissolved in water.

Process is based on dependency of boiling temperature of water on air pressure. As opose to clasical distillation, the air pressure in boiling chamber is decreased. This means, that boiling temperature of water is lower. Lower boiling temperature requires less energy intensive heat source for heating. That's why operating costs are very low.

Vacuum evaporation has two outputs. The first one is a distillate, clean water, which can be either discharged or recycled back into the production process. The distillate has very low conductivity.

The second output is a concentrate, concentrated solution. The concentrate can be further used if it is a product or it contains valuable substances. If the concentrate is further unusable, it must be proffesionally disposed.

Vacuum evaporation can achieve over 90% volume reduction of waste water. Therefore vacuum evaporators are necessity in Zero Liquid Discharge systems for water recycling in production process.
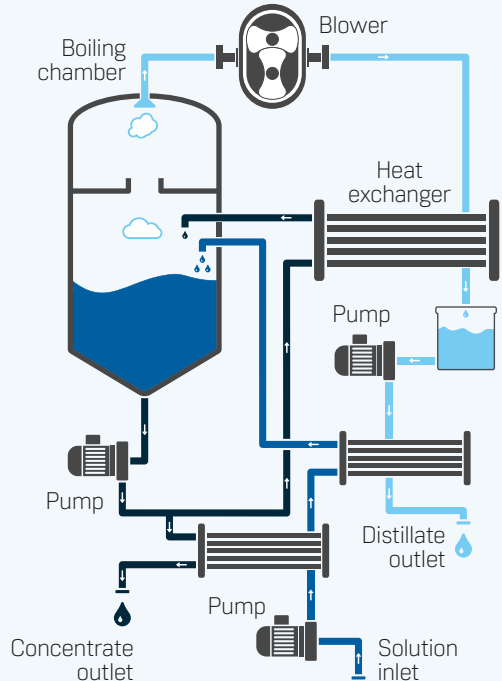
There aren't required any additive chemicals in vacuum evaporation, which is another reason why vacuum evaporators are very eco-friendly.

Automatic 24/7 operation makes evaporators easy to use and maintain.

AQUADEST-D

Suitable for high volumes
Low operating costs

- mechanical vapour
- recompression heating system
- heat recuperation from concentrate outlet
- continuous operation

- operating pressure 70 kPa
- boiling temperature 90 °C
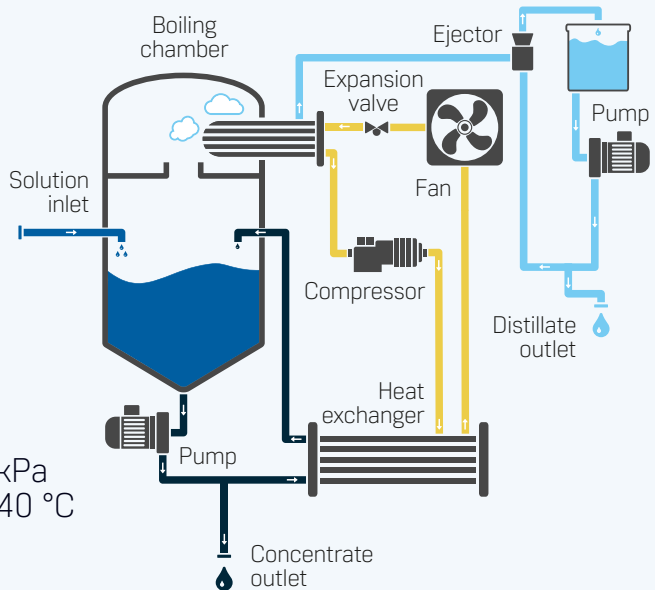- 0,05 kWh / l of distillate

Boiling chamber

Blower

Heat exchanger

Pump

Pump

Distillate outlet

Pump

Concentrate outlet

Solution inlet

Mechanical vapour recompression

AQUADEST-K

Suitable for thermic instable and corrosive water
Low initial and operating costs
Suitable for low volumes

- heating and cooling
  provided by heat pump
- continuous operation

- operation pressure 6-7 kPa
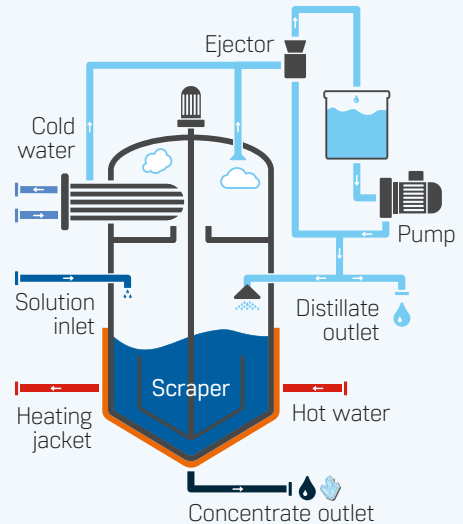- boiling temperature 35-40 °C
- 0,15 kWh / l of distillate

Boiling chamber

Ejector

Pump

Expansion valve

Fan

Solution inlet

Compressor

Distillate outlet

Heat exchanger

Pump

Concentrate outlet

Heat pump

AQUADEST-VR

Suitable for highly concentrated inlet solutions
Concentration up to semi-solid state
Waste heat and cold recovery

- heating via heating jacket
- uses excess hot and cold water
- automatic scraper
- chamber cleaning system
- batch operation

- operating pressure 6-30 kPa
- boiling temperature 35-70 °C
- heating 0,72 kWh / l of distillate
- cooling 0,72 kWh / l of distillate

Ejector

Cold
water

Pump

Solution
inlet

Distillate
outlet

Scraper

Heating
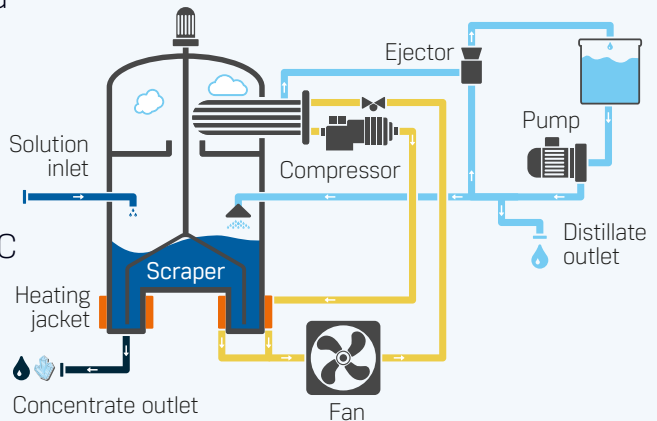jacket

Hot water

Concentrate outlet

Crystallization and external heat source

AQUADEST-KR

Suitable for highly concentrated inlet solutions
Concentration up to semi-solid state
Suitable for low volumes

- heating via heating jacket
- heating and cooling provided
  by heat pump
- automatic scraper
- chamber cleaning system
- batch operation

- operating pressure 6-7 kPa
- boiling temperature 35-40 °C
- 0,2 kWh / l of distillate

Solution inlet

Ejector

Compressor

Pump

Distillate outlet

Scraper

Heating jacket

Concentrate outlet

Fan

Crystallization and heat pump

AQUADEST-V

Suitable for thermally unstable and corrosive waters
Suitable for large volumes of input solutions
Low acquisition and operating costs
Continuous operation
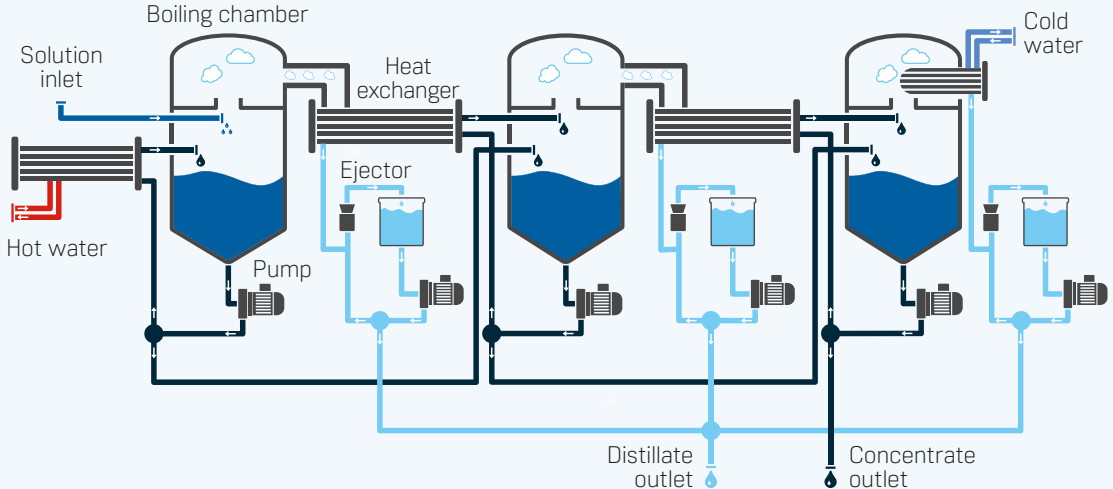
Multi-stage evaporator

AQUADEST

D	K	KR	VR	V
mechanical vapour recompression	heat pump	crystallization heat pump	crystallization external heat source	multi-stage evaporation

Distillate production [l/day]

D	K	KR	VR	V
6 000	600	250	2 000	from 90 000
10 000	1 200	500	4 000	to 400 000
15 000	2 400	1 000	6 000	
22 000	3 600	2 000	8 000	
30 000	4 800	3 000	12 000	
45 000	6 000	4 000		
60 000	9 000	6 000		

Energy consumption [kWh/l]

D	K	KR	VR	V
0,05	0,15	0,2	heating 0,72 cooling 0,72	heating 0,72 cooling 0,72

Used material options:

N - Stainless steel 316 L/Ti
D - Super-duplex SAF 2507
Ni - Nickel alloy 2.4819

Made by:

KOVO FINIŠ