



**WASTEWATER TREATMENT
BY MVR EVAPORATION**





“Did you know that an EPCON MVR evaporator can reduce your industrial wastewater flow by 90-99%?”



*«Why treat your
wastewater using
EPCON MVR
evaporation?»*

- ✓ The treated water can be discharged as surface water or re-used as process water.
 - ✓ The energy consumption is 8-40kWh/m³ treated water.
 - ✓ We can treat wastewater volumes from 100 kg/h to 100.000 kg/h.
 - ✓ Treated water is clean, free of salts, solids and particles.
 - ✓ Water treated at high temperature.
 - ✓ Well proven technology.
 - ✓ Very low energy consumption.
 - ✓ Good operational availability.
 - ✓ Low maintenance cost.
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Mining leachate

Mining leachate, both from active and abandoned mines, can be a severe threat to lakes, creeks and rivers. The leachates contain heavy metals that damage the local eco systems. EPCON MVR evaporators have proven to be able to reduce leachate streams with more than 99%



Landfill leachate

Leachate from landfills contains a mixture of organic and inorganic compounds. These leachates also often contain ammonia. These leachates are well suited for MVR evaporation.



Metal fabrication wastewater

Fabrication of metal parts generate waste streams from plate rinsing, cutting, drilling, part cleaning, pickling, penetrant testing and more. Many of these streams are water based and are well suited for treatment by MVR evaporation.

Typical wastewater applications suitable for
EPCON MVR evaporation



Fish net cleaning water

In fish-farming, the fish nets need to be cleaned at regular intervals. This cleaning water contains the Cu based impregnation from the nets. An EPCON MVR evaporator produces clean water from this stream.



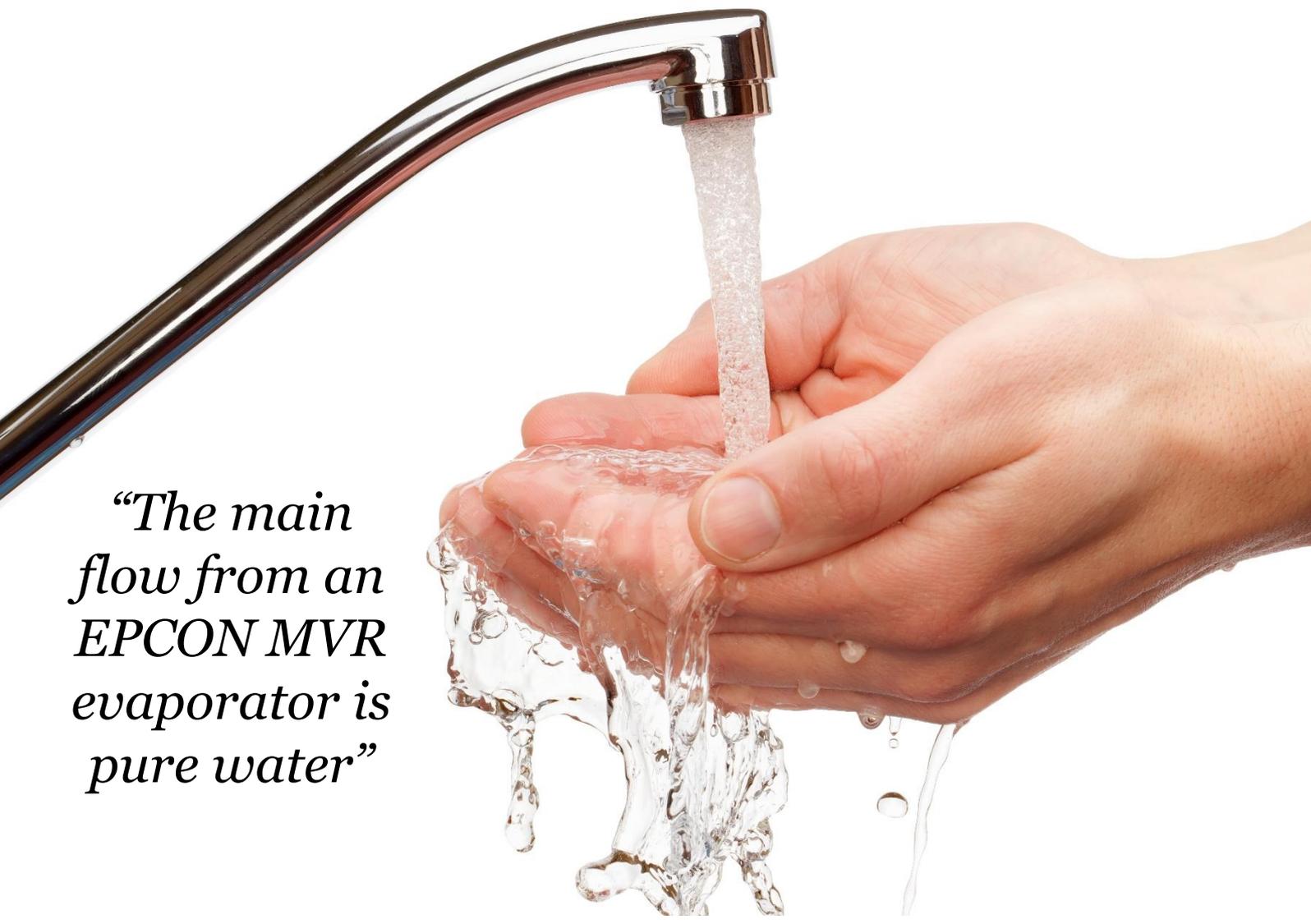
Food and ingredients wastewater

In dairies, breweries, food and ingredients industry there are a strict demand for cleaning. Often the rinsing and cleaning waters are sent directly to the biological wastewater plants. By treating this water by MVR evaporation, the water can be re-used for cleaning or discharged. The concentrate containing the solids can be used for fermentation or biogas production.



And many more..

MVR evaporation is suitable for a wide range of wastewaters. Contact EPCON and we will discuss the possibility for treating your wastewater by MVR evaporation.

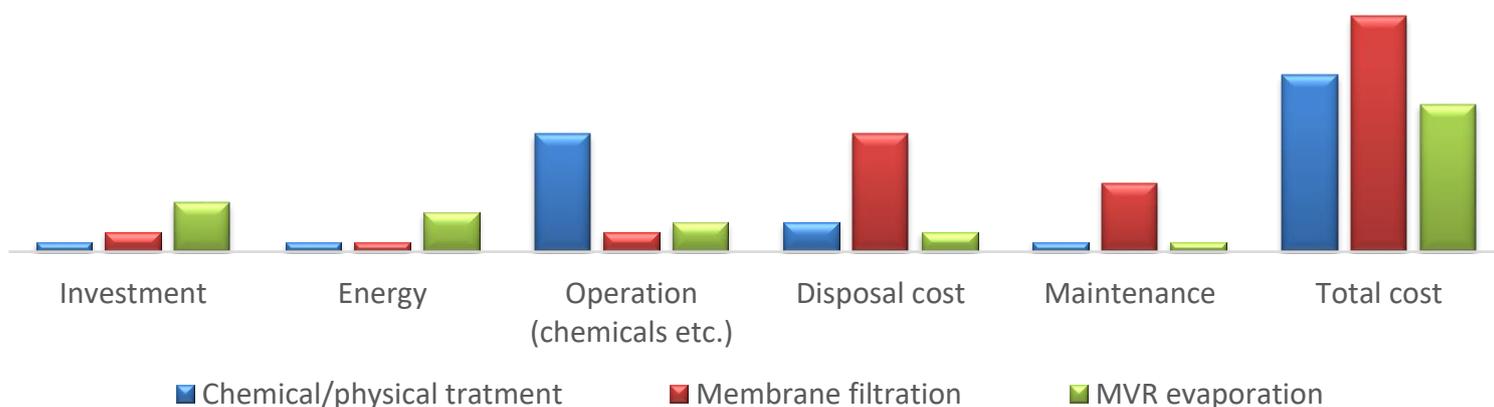


“The main flow from an EPCON MVR evaporator is pure water”

	Chemical/physical treatment	Membrane filtration	MVR evaporation
How it works	Chemicals are added to get precipitation of solids.	Wastewater is filtered through membranes and separated as permeate and retentate.	The wastewater is evaporated at high temperature. Pure water condenses.
Energy consumption	1-5 kWh/t cleaned water.	1-5 kWh/t cleaned water.	8-50 kWh/t cleaned water.
Chemical consumption	Chemicals are used for flocculation and precipitation.	Chemicals used for cleaning only.	Chemicals used for cleaning only.
Disposal	Treated water to public sewer. Precipitation to waste management.	Treated water can be recycled to process or goes to public sewer. Retentate to waste management.	Treated water can be recycled in process or discharged to surface water. Concentrate to waste management.
Water recovery	-	50-85%	90-99%
Maintenance	Low	Membranes need regular replacement	Very low

Example is based on high cost for waste disposal and very strict limits for water purity for process recycling.

Comparison of different technologies for wastewater treatment





EPCON lab evaporation test

A first step is often a lab evaporation test. This test confirms the main liquid properties and suitability for evaporation. Normally 2 litres of liquid for testing is enough. Condensate quality can be analysed after evaporation. A test report is issued.

*«There are seldom two equal wastewaters.
That is why we think that evaporation tests are important.»*

Some wastewaters are suited for evaporation, others are not.

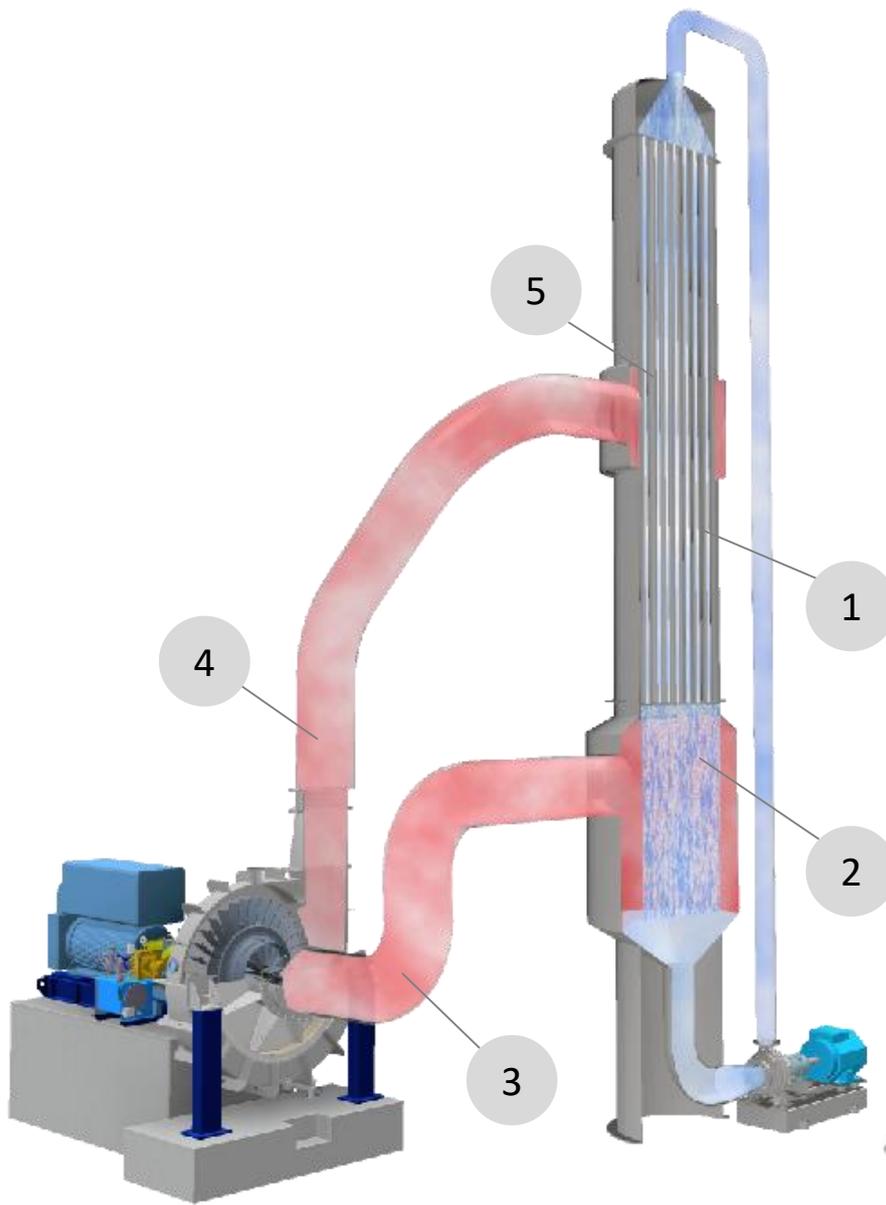
For EPCON and our customers it is essential to ensure that we choose the correct technical solution for each and every project.

EPCON pilot evaporators



EPCON has a wide range of pilot evaporation plants including two mobile 20 ft container for pilot testing of wastewaters at the customers site. The pilot unit can operate in a wide range of conditions..





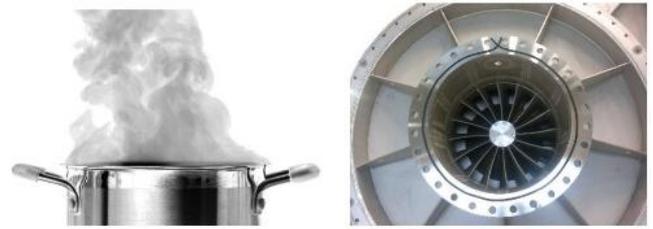
The EPCON MVR evaporator only uses 8-40 kWh per ton evaporated water.

This is a reduction of up to 99% compared to a 1 effect steam driven evaporator.

MVR or Mechanical Vapor Re-compression (also known as MVC) is a technology where the vapor is compressed in a fan or a compressor to a higher temperature and pressure.

This compressed vapor is then used as energy source instead of boiler steam. Most of the products delivered by EPCON are based on MVR technology.

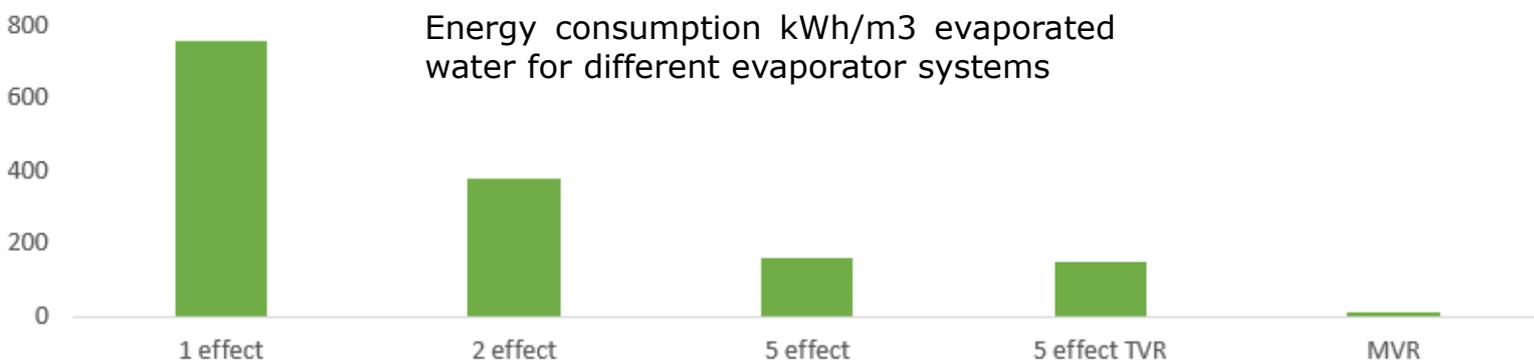
EPCON has 30 years experience with MVR technology.



1. The liquid evaporates.
2. The liquid is separated from the vapor to give a clean condensate
3. The vapor goes to the MVR fan at 100°C
4. The MVR fan compresses the vapor to higher pressure and temperature (105°C, sat)
5. As the vapor at 105°C is heat exchanged with the evaporating liquid, it condenses into a clean condensate.

The temperatures used here are examples only. EPCON always select the optimum evaporation temperature and temperature rise in the MVR fan. This selection is done based on the wastewater properties.

EPCON MVR technology





“EPCON delivered its first MVR evaporator in the mid 1980s. Since then our evaporation technology has developed a lot.”





*”The EPCON MVR
evaporator is built to last for decades.*

*Our After Sales services is your guarantee and is an important
part of our concept.”*

EPCON offers all customers the possibility for a 24-hours after sales service that includes trouble-shooting, spare parts, preventive and corrective maintenance, as well as inspection of installations.

EPCON has 30 years of experience in servicing evaporators and MVR vapor fans. Hence, EPCON can offer a direct service for vapor fans to our customers. This may also include a favourable spare parts agreement.

EPCON also offers a remote diagnostic service. Functional control and fault detection can be implemented by use of modern telecommunications, minimizing the need for external service personnel.

Our service department can give a separate proposal for a Service Agreement with the customer.

After sales services:

- Supply of spare parts.
- Remote diagnosis.
- Education of local service personnel.
- Visits by our service personnel for preventive maintenance.
- Regular revisions and maintenance of installation.



Falling film and forced circulation MVR evaporators

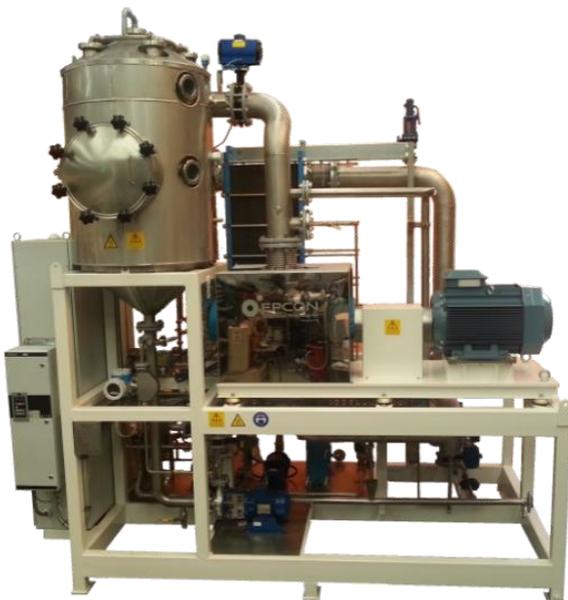
EPCON MVR evaporators are tailor-made and can be delivered for indoor installation or outdoor installation in containers.

Evaporation capacity range from 1000 – 100.000 kg/h.

Energy consumption is 8 – 40 kWh/t evaporated water.

EPCON MVR evaporators

EPCON delivers several types of evaporators. For each application we always find the optimum evaporator configuration based on the properties of the wastewater and client demands.



EPCOVAP-MVR

EPCOVAP-MVR compact evaporators are skid based.

They are available in 6 different sizes with evaporation capacity from 100 – 2500 kg/h.

Energy consumption is 15 – 50 kWh/t evaporated water.



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