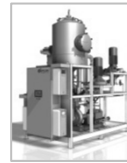


# WASTEWATER TREATMENT



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EPCON EVAPORATION TECHNOLOGY AS

EVAPORATORS – DRYERS – DISTILLATION & DEHYDRATION – HEAT RECOVERY SYSTEMS  
ENGINEERING AND AFTERSALES SERVICES

### EPCON products

EPCON supplies process plants for separating different types of fluids or fluids from solid material, based on the principles of evaporation, distillation and drying. EPCON has developed unique energy efficient technical solutions for a number of separation and purification processes.

### Applications for wastewater treatment

Typical applications within wastewater treatment include:

☐ Treatment of wastewater from several industries including:

- Dairy industry
- Food industry
- Biomarine industry
- Pulp & paper industry
- Municipal waters

Typical reduction values obtained are:

- COD reduction 95-99%
- BOD reduction 95-99%
- N content reduction 95-99%
- P content reduction 98-99%

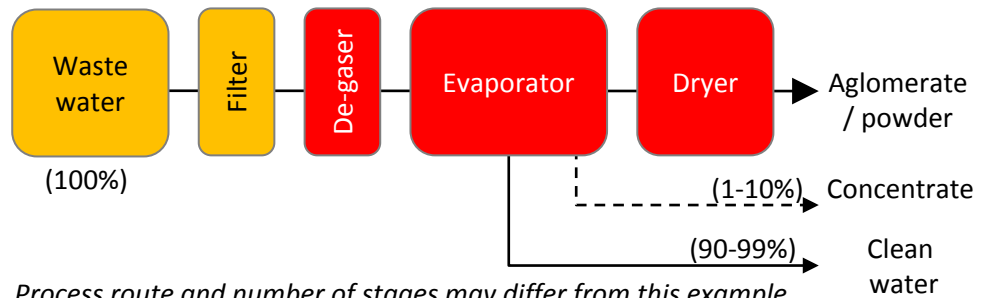
If required the condensate can be polished with an ion exchange unit to achieve higher reduction.

☐ Drying of sludge.

EPCON has developed a unique superheated steam dryer that is well suited for drying of sludge from pulp & paper industry, chemical industry and food industry as well as municipal sludge.

EPCON has experience with the above mentioned applications.

### Example : wastewater treatment



Process route and number of stages may differ from this example.

**Energy consumption for such an installation is normally 7-15 kWh /t clean water produced.**

### Examples of wastewater streams for which EPCON has delivered treatment plants or performed pilot tests:

- Potatoe, corn and grain wastewater
- Oil & gas wastewater
- Fish net wash water
- Wash and rinse water from industrial processes
- Dairy wastewater
- Black and grey water
- HDW (Chemical industry)
- Filtrate (pulp & paper)
- Chip wash water (pulp & paper)
- lingnin (Pulp & paper)
- Biogas reject water
- Vitamin wastewater
- Lysine wastewater
- And many more...

### EPCON products for wastewater treatment:

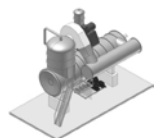
➤The EPCOVAP-MVR evaporators are a series of standardized compact evaporators with low energy consumption. These are for lower capacity evaporation in the range of 500-2500 kg/h evaporation.



➤Falling film evaporators with MVR to be tailormade for each specific application. EPCONs falling film evaporators are made for being resistant to fouling. They have a compact design, and hence a minimum of space is required.



➤EPCON superheated steam dryers for drying of wastewater streams consuming a minimum of energy.



➤Distillation units for stripping of ammonia or other volatile components using steam.

➤Combined evaporation plants. The technologies above are often combined to obtain the best technical solution.



**Refer the EPCON separate datasheets for further information of the listed process plants.**



## Case study

### wastewater treatment of filtrate proposed to pulp and paper mill.

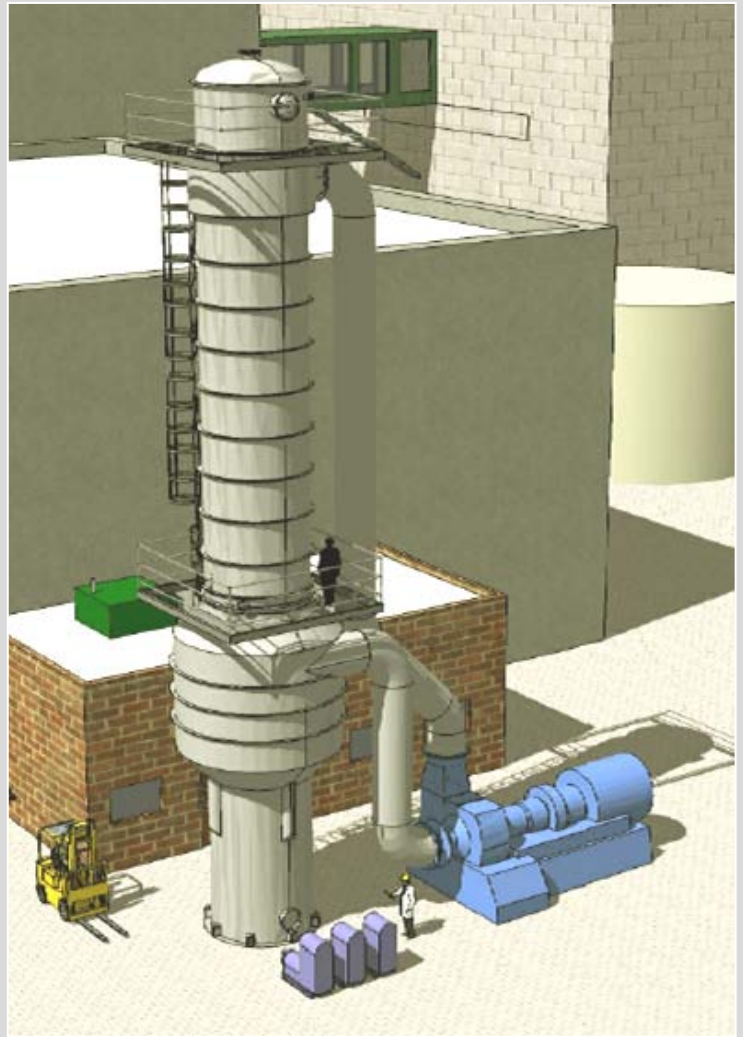
A pulp and paper mill has a problem with a stream of filtrate causing a high load on their biological wastewater treatment plant.

For this case EPCON has proposed an MVR falling film evaporator.

wastewater stream	107.4 t/h
COD in waste stream	13.000-26.000 mg/l
Condensate water stream	104 t/h
COD in condensate	100-500 mg/l
Concentrate	3.4 t/h
Energy consumption	1210 kW



*The concentrate from the evaporation system is foreseen to be burned in an existing burner.*



## Case study

### Hoff Norske Potetindustrier BA producing potatoe chips, frites etc.

#### CHALLENGES BEFORE INSTALLING EPCON EVAPORATOR:

- Low capacity of the existing biological treatment plant.
- Physical restrictions for expanding the treatment plant.
- Need for removal of phosphorus from the discharge.
- Expensive sludge handling.

Feed	33000 kg/h
Evaporated mass	32500 kg/h
Concentrate	500 kg/h
Feed concentration	0.3 %
Output concentration	15 – 20%
Total power consumption	390 kW



#### BENEFITS AFTER INSTALLING EPCON EVAPORATOR:

- Increased treatment capacity handling variations in the feed volume.
- COD content in the discharge water reduced from 6-17.000 mg/l to 2-500mg/l.
- Almost all phosphorus are removed from the discharge water.
- The concentrate from the evaporation is a valuable resource which is utilized for the production of aquavit, a Norwegian form of distilled spirits.

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