

# MVR DEHYDRATION ENERGY EFFICIENT SYSTEM



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EPCON EVAPORATION TECHNOLOGY AS

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

**Our competence:**

With its history going back to 1986, EPCON is an international supplier of separation and energy recovery technology, based in Trondheim, Norway. These technologies provide added value for our customers.

EPCONs key competence is energy optimization of thermal separation processes like evaporation, distillation and drying.

EPCON offers all customers a 24-hour aftersales service that includes trouble-shooting, spare parts, preventive and corrective maintenance, as well as inspection of installations.

**Dehydration:**

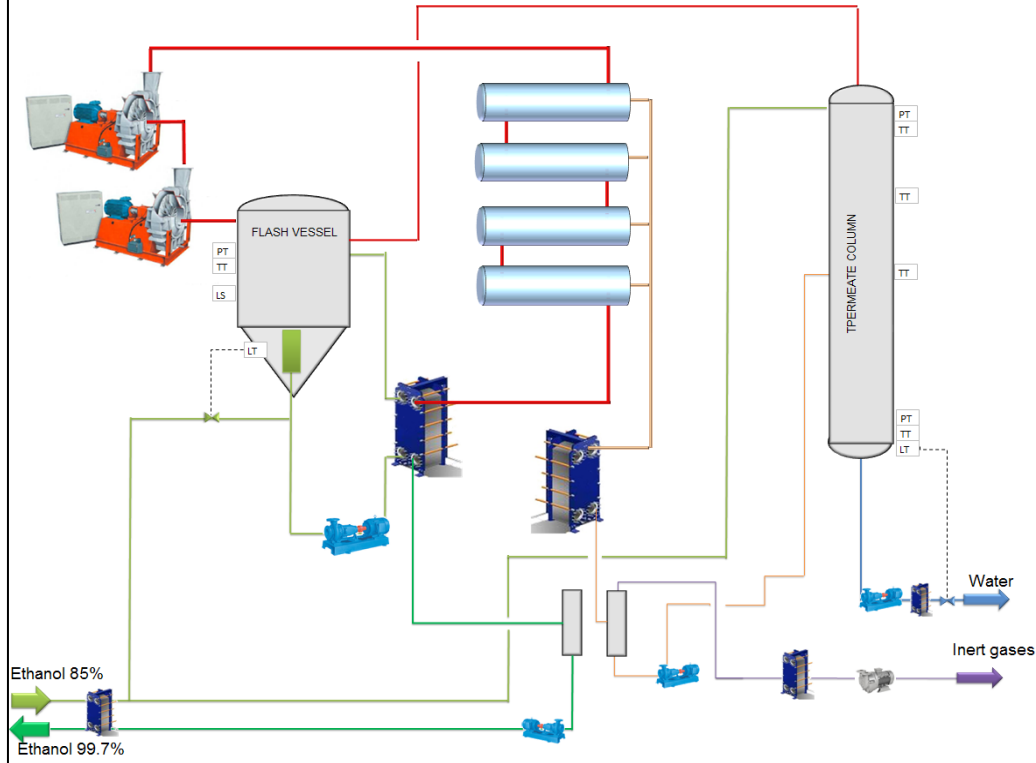
EPCON has developed and delivered a new patented energy optimized dehydration system that utilize an MVR evaporator connected with membranes. A permeate distillation column is used to recycle the ethanol found in the permeate.

This system is developed to dehydrate bioethanol that has been pre concentrated to 80-95 %wt EtOH before entering the system. The energy saving is typical 60-80% compared to traditional standalone dehydration systems, achieved through novel integration of MVR in the total process design.

**Applications:**

Other applications for EPCON dehydration plants are:

- Dehydration of ethanol.
- Dehydration of isopropanol.



**MVR**

The EPCON dehydration systems are delivered with MVR technology, which provides an energy saving of 60-80% compared to traditional stand alone dehydration system.

**Main advantages:**

The below listed advantages are achieved by applying the EPCON dehydration technology:

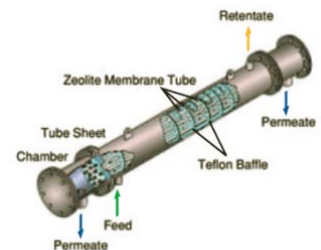
- Significantly reduced energy consumption.
- Significantly reduced cooling effect.
- Standalone unit, i.e. flexibility in regard to operating temperature and pressure.
- Suitable when utilizing MVR in upstream distillation (refer EPCON distillation brochure).
- Suitable when utilizing membrane technology for dehydration.

**Experience:**

EPCON has delivered a dehydration unit with Zeolite membranes that is now in operation in Finland. The full capacity of this plant is 70.000 ton bioethanol per year.

**Membranes**

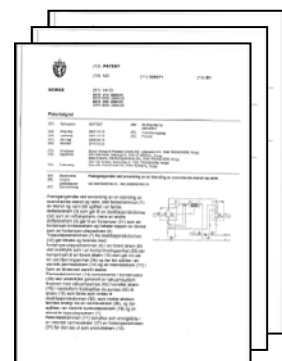
Both zeolite- or polymeric type of membranes are suitable for use in the EPCON MVR dehydration system.



**Patented technology**

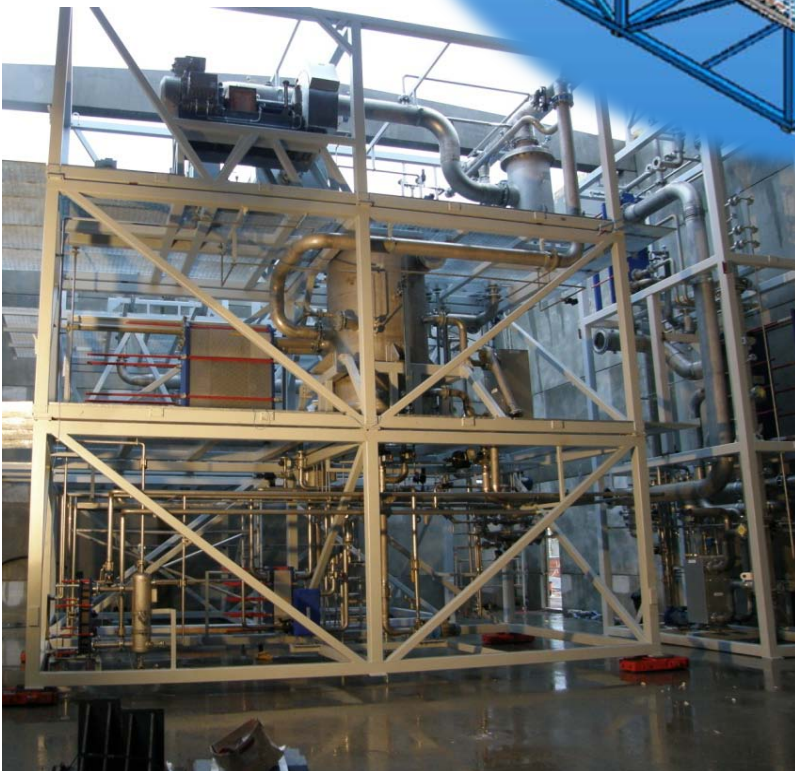
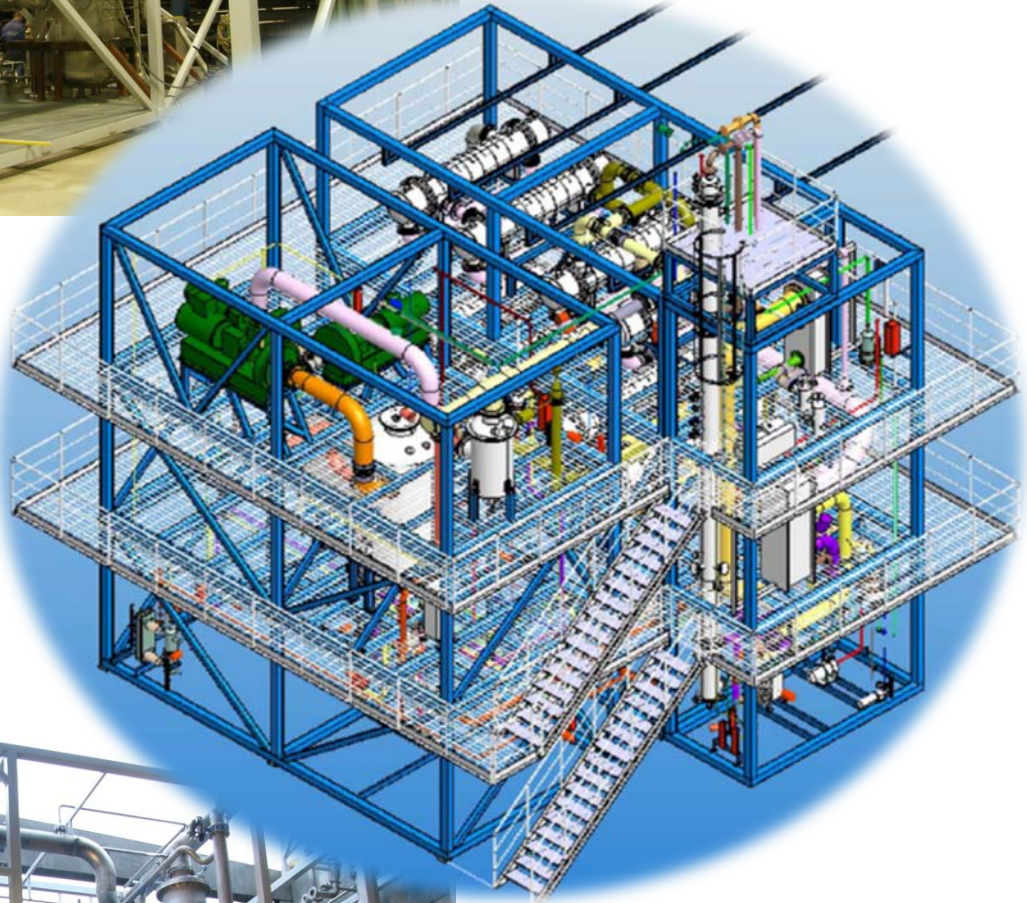
This technology is patented by EPCON, with title: "Method for dewatering a mixture of mostly ethanol and water".

Refer for instance the Norwegian patent no. NO328571 or PCT application no. PCT/NO2008/000353.





*MVR  
dehydration  
plant for  
bioethanol  
delivered by  
EPCON.*



#### SCOPE OF SUPPLY:

EPCON can offer a wide range of scope of supply, ranging from engineering and main component delivery to turnkey plants. The latter was the case for the project visualized on this page, where a number of frame skids were pre fabricated in the factory before efficiently installed on site.

**TECHNICAL SPECIFICATIONS** (example is for a typical bioethanol factory and not linked directly to the plant shown on this page):

- Product: Bioethanol (fuel quality)
- Capacity: 10.000 kg per hour
- Feed conc.: 95 wt% EtOH
- El. cons.: 175 kW
- Thermal cons.: 375 kW
- Energy saving: 80 %, ref. \*)
- Op. pressure: 5 /-1 barG

\*) Comparison done with non-MVR traditional membrane vapour permeation process including permeate recovery.

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