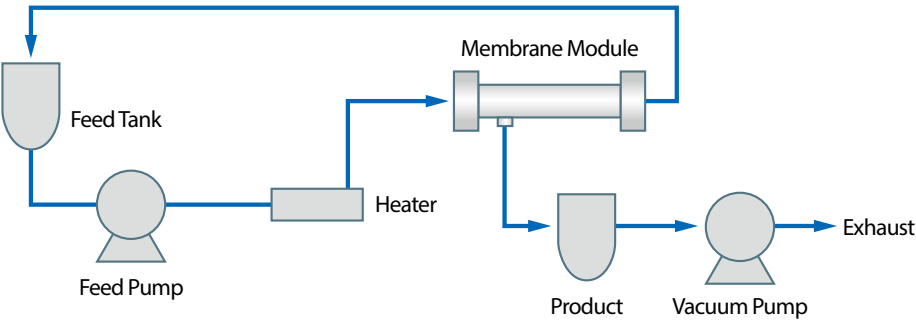


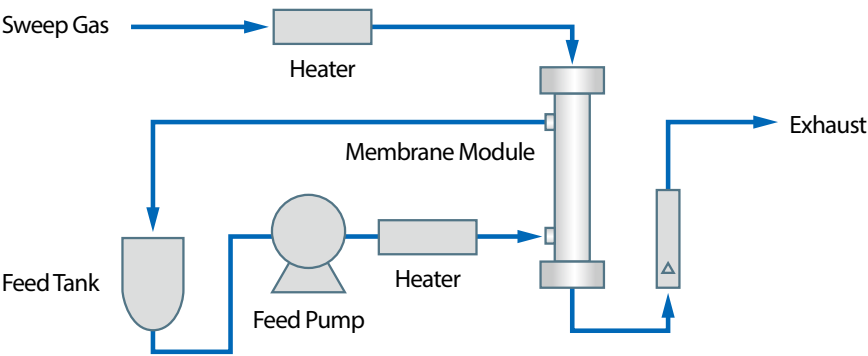
Meritair® Pervaporation & Vapor Permeation Membrane

Schematic Diagram

Vacuum method



Sweeping method



Pervaporation is derived from the two steps of the process, permeation through the non-porous membrane by the permeate, then its evaporation into the vapor phase which is condensed into liquid phase. Membrane acts as a selective barrier between the two phases, the liquid-phase feed and the vapor-phase permeate. It allows the desired component of the liquid feed to transfer through it by vaporization. Pervaporation technology could be applied to the separation of alcohol/water mixture, organic compound/water mixture and vapor permeation process. AIRRANE is currently providing O&M service by installing IPA recycling failures within the semiconductor plant site. IPA recycling can reduce wastewater and reuse IPA (isopropyl alcohol) in the semiconductor industry.

Key Applications



Pervaporation/Vapor Permeation

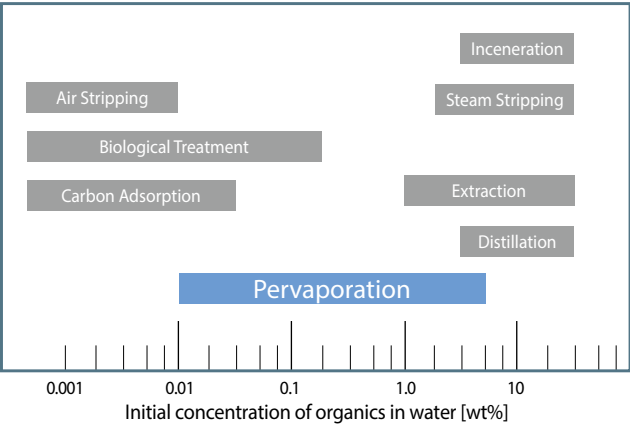
- Dehydration of water/organic liquid mixture
- Purification of water/alcohol mixture
- Removal of VOCs from water/organic liquid mixture
- Separation of organic/organic liquid mixture
- Monomer recovery from polymerization process
- Process yield and efficiency increase for dehydration of condensation reactions

AIRRANE Product Specifications

Model Number	Dimension (mm)			Connection (inch)			Weight
	L	OD	ID	Feed	Retentate	Permeate	
MVB-6040P	1080	196	150	1.5"	1.5"	1.0"	19kg

Why Membrane Pervaporation/ Vapor Permeation?

- Low-cost separation without chemical additives
- Separation of azeotrope mixtures
- Effective separation even with small gap of boiling points of mixture
- The feed mixtures to be treated may be supplied in liquid (PV) or vapor form (VP)
- Low energy consumption system for vapor permeation
- Compact size facility design
- Easy and quick start-up system
- High purity permeates attainable



Comparison of the separation methods for VOCs removal from water

Technology Comparison of dehydration costs for Ethanol from 94 vol% to 99.9 vol%

Utilities	Vapor-permeation (€/t)	Pervaporation (€/t)	Entrainer distillation (€/t)	Molecular Sieves Adsorption (€/t)
Vapor	-	6.4	60.0	40.0
Electricity	20.0	8.8	4.0	2.6
Cooling water	2.0	2.0	7.5	5.0
Replacement of membranes	9.5	15.3	-	-
Entrainer	-	-	4.8	-
Replacement of molecular sieves	-	-	-	25.0
Total costs	31.5	32.5	76.3	72.6

W. Kujawski, Polish Journal of Environmental Studies, Vol 9, No 1(2000)

