



PERVATECH[®]

Datasheet

SPIRAL-WOUND PDMS MEMBRANES

Spiral-wound PDMS (polydimethyl siloxane) membranes have organophilic (hydrophobic) characteristics, which means that the organic constituent of the feed passes preferentially through the membrane.

MEMBRANE ELEMENT

Geometry	Flat sheet, configured into spiral-wound construction for liquid pervaporation
Dimensions	SR1: 0.5 m ² SR2: 1.0 m ² SR5: 4.0 m ² For gas separation, the membrane surface area per module can be 70 to 100 % higher, because thinner sheets and leaves can be used.
Substrate material	PET
Intermediate layer	Type of PI
Top layer	PDMS

OPERATIONAL WINDOW

Temperature	Maximum 70 °C (short-term 80 °C)
Pressure	Maximum 5 bar
pH	1-12
Pre-filtration	10 µm cartridge filter

CLEANING AND STORAGE

Cleaning

- Clean the element by flushing with water to which a non-ionic detergent (10 ppm KOH) has been added. Alternatively, enzymatic solutions may be used, depending on the feed composition.
- In case of food & additives processing, please contact us for alternatives.

Sterilization options

Steam	106-108 °C
Flushing	With ethylene oxide or 100 % ethanol

Storage

Storage before use

Out of direct sunlight, at room temperature, < 70 % relative humidity

Storage after use (short-term)

In a mixture of water and 10-15 % IPA or in a solution of water with 2500 ppm sodium metabisulfite

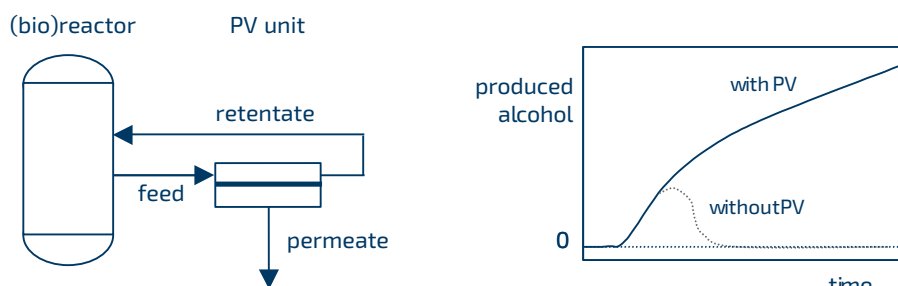
Storage after use (long-term)

In a solution of water with 0.7 % benzalkonium

EXAMPLES OF APPLICATIONS WITH SPIRAL-WOUND ORGANOPHILIC (HYDROPHOBIC) PDMS MEMBRANES

- Recovery or extraction of organics (in biotech or biotech-related food applications) from natural feed streams like fruit juices, wine, beer, coconut oil, essential oils (carvone, limonene) and in combination with fermentation
- Removal of ethyl alcohol (and other alcohols) from wine and beer
- Upgrading of reverse osmosis permeate in juice production
- Combination with bioreactor in production of alcohols (ethanol, IPA, butanol), ABE (acetone, butanol, ethanol), aldehydes, flavor production as well as acid production
- Removal of volatile organic compounds (VOC)
- Enrichment of oxygen. This process is used as quality control in production.
 - For gas separation, different types of leaves and nettings are used compared to liquid pervaporation, since hydraulic resistance plays a much less important role
 - Typical data for quality control on air:
 - Feed flow rate: SR1-2: 5 m³/h
 - Temperature: room temperature
 - Pressure: 5 bar
- Permeate flow: 250-300 liter/m²·h

Typical example of pervaporation (PV) process in combination with bioreactor:



The image shows the principle of a membrane reactor for continuous product recovery (alcohols, aromas). The system with pervaporation continuously produces alcohol while other systems stop when inhibiting amounts of alcohol (or another inhibitor) have been reached. In some cases, a pretreatment is necessary. PDMS membranes are stable and insensitive to fouling.

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