Made Possible by KonKer™.

KonKer™, the zeolite membrane for food dehydration and concentration from Mitsubishi Chemical, can be used with a variety of liquid foods, making it possible to safely concentrate and dehydrate without the use of heat while preserving flavor and fragrance components.

Zeolite membrane dehydration technology has built up a track record through refining industrial chemicals, contributing to cost and energy reduction in industry.

From proposal to the design and introduction of ideal devices for foods and the environment, Mitsubishi Chemical proposes a new concentration technology using the technological power possible only for a general chemicals company.

Concentrated sake made with the KonKer™ dehydration and concentration system

In fermented liquors such as Japanese sake, beer and wine, alcohol and active components are created through fermentation. However, there is a limit to how far concentration may be increased through fermentation alone. Since heating evaporates both water molecules and alcohol (ethanol), in a certain ratio (azeotropy), it reduces the concentration of alcohol, and there is a risk of denaturing active components that are vulnerable to heat. In cooperation with Nishino Kinyo Co., Ltd., the Mitsubishi Chemical Corporation has used KonKer™’s distinctive ability to selectively extract water molecules to develop a new type of sake: Kohakuutsuju, sake in which alcohol and flavor components are concentrated to double the strength of regular Japanese sake.

Crafted from Nishino Kinyo's famous sake distillery "Dieto no Hacoumon." Kohakuutsuju is sake created by carefully concentrating umami and alcohol components. The smooth sweetness and profound acidity harmonizes to create a real, rich aftertaste.
The Technological Strength of KonKer™

Features

Safe Materials

“Zeolite” is the generic name for minerals with fine pores. As an agent for use in food manufacturing, zeolites are registered as an existing food additive in the Food Additives Law. In addition, the zeolite membrane KonKer™ conforms to the standards for utensils, containers and packaging in the Food Sanitation Law of Japan.

Compatible with a Variety of Liquids

KonKer™ utilizes the MSF (Mitsubishi Chemical High-Silica Membrane) zeolite membrane developed by the Mitsubishi Chemical Group Science and Technology Research Center, Inc. It is highly water and acid resistant, and will not be corroded by fruit juices and other acidic foods. Ask about its compatibility with liquids that conventional food concentration membranes (reverse osmosis membranes, etc.) don’t handle well, such as liquids with high electrolytic concentration and liquids that include highly hydrophilic components. It can also be used with liquids that include solid material.

Dehydration Concentration Principle

The simplest method of concentrating liquid foods that include water is to heat them and evaporate the water. However, in this method, alcohol and flavor components that evaporate along with the water and components that degrade with heat are lost. The KonKer™ zeolite membrane has pores that allow only molecules that are the same size or smaller than water molecules to pass through, making it possible to dehydrate and concentrate without losing the food’s flavor and fragrance components.

Dehydration Concentration System Outline

By supplying the liquid you wish to concentrate to the exterior of the zeolite membrane element, then lowering the pressure inside the membrane element with a vacuum pump, only the water molecules in the target liquid are drawn into the membrane element. The water molecules are conducted into a cold trap (condenser) as a gas (steam), where they return to their liquid state and are collected. The target liquid outside the membrane element is concentrated, with only its water reduced.

KonKer™ System Diagram

[Diagram showing the system with labels for Concentration Tank, Membrane Element, Liquid for Concentration, Circulating Pump, Condenser, Exhast, Cooling Trap, Vacuum Pump, and Immersive Structure.]
## Product Lineup

### Membrane Element

**Product Features**
- Realizes durability with regard to high moisture content and highly acidic liquids, something impossible for previous zeolite membranes.
- It's now possible to selectively dehydrate and concentrate a variety of foods without heat.

<table>
<thead>
<tr>
<th>Product Structure</th>
<th>Tube-shaped zeolite membrane connecting components for plumbing</th>
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</thead>
</table>

**Product Information**
- **Measurements**: Internal diameter 9mm, external diameter 12mm, length 400mm (membrane) 454mm (including connecting components)
- **Weight**: Approx. 10kg
- **Materials**: Membrane: MSM1 zeolite, porous alumina
  - Connecting parts: SUS304, PFA, PEP
- **Applicable pH**: Neutral-acidic (not for use with alkalis)
- **Applicable temperatures**: 5°C-100°C

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### Compact Immersive Processor

**Product Features**
- Simple structure: ideal as test equipment.
- Easy maintenance

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<tr>
<th>Product Structure</th>
<th>Membrane element, concentration tank, vacuum line and pump, condenser</th>
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</table>

**Product Information**
- **No. of Membranes Equipped**: 8
- **Measurements**: L440 x W110 x H310mm
- **Tank Capacity**: Approx. 6L max.
- **Weight**: Approx. 10kg (without membranes attached and tank empty)
- **Materials**: Concentration tank: PET, or SUS304
  - Module section: SUS304
- **Dehydration Speed**: -30g/h (room temperature, reference value)
- **Utilities**: AV100V

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## Compact Circulating Processor

**Product Features**
- Tank for the liquid being concentrated and concentration unit (module) installed separately.
- Made compatible with a variety of pHs by setting the fluid in motion.
- High scalability, ideal for foods.
- Structure similar to actual, large-scale machines at time of introducing factory mass production.

<table>
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<tr>
<th>Product Structure</th>
<th>Module with internal membrane elements, concentration tank, temperature control function, circulating pump, vacuum line and pump, condenser</th>
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</table>

**Product Information**
- **No. of Membranes Equipped**: 8
- **Measurements**: L600 x W300 x H510mm
- **Tank Capacity**: Approx. 4L max.
- **Weight**: Approx. 60kg (without membranes attached and tank empty)
- **Materials**: SUS304
- **Dehydration Speed**: -30g/h (room temperature, reference value)
- **Utilities**: AV100V

*These specifications are for AAKX70S-01.

Larger processors are also available. Contact us, and you’ll be provided with the ideal system.

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### The Possibilities of KonKer™

KonKer™, the zeolite membrane for food dehydration and concentration from Mitsubishi Chemical, is new concentration technology that takes the global environment and energy efficiency into consideration. Research and development is progressing in an endeavor to facilitate a variety of concentrates, from alcohol and all kinds of fruit juices to broth and tea. KonKer™ makes it possible to concentrate liquid foods that could not be concentrated before, and proposes technology for the future.