Membralox® ceramic membrane applications

**Biopharmaceuticals**
- Biomass recycling
- Clarification of fermentation broth for the production of antibiotics, enzymes, vitamins
- Purification of vitamin, enzyme solutions
- Production of pharmaceutical grade water
- Perfume decolorization
- Separation in the liposome production process
- Effluent treatment

**Chemicals**
- Pigment, hydroxide and catalyst recovery
- Latex concentration
- Solvent recovery
- Oil/water separation
- Reverse osmosis pretreatment
- Refinery effluent treatment
- Hydrochloric acid clarification
- Effluent treatment

**Electronics**
- Particle removal from ultrapure gases
- Ultrapure water polishing
- CMP process sludge recovery
- TMAH solutions recovery / clean up
- Dicing saw cooling water clean up
- Wafers

**Food & Beverage**
- Sugars, sweeteners and derivatives
  - Saccharification liquor clarification
  - Clarification of fermentation broths in the production of aminoacids, organic acids, polyols
  - Clarification in sugar cane refining
Drinking milk and cheese production

- Bacteria removal for extended shelf life (ESL) milk
- Bacteria removal from milk for cheese processing and baby food
- Concentration of fresh cheese
- Milk protein concentration
- Milk casein standardization
- Bacteria removal in whey processing
- Whey defatting
- Whey protein isolates (WPI) concentration

Beverages

- Beer recovery from yeast
- Clarification of spirits, ciders, fruit juices
- Bacteria and/or iron removal, drinking water production

Food ingredients and additives

- Clarification and/or concentration of gelatin, arabic gum
- Bacteria removal
- Protein concentration and fractionation
- By-product protein recovery
- Tank bottom recovery
- Used cooking oil recovery
- Fractionation, dewaxing and fat retention
- Clarification of vinegar

Waste streams

Miscellaneous

Pulp and paper – printing

- Pigment and ink recovery
- Dewaxing
- Effluent treatment

Textiles

- Printing dye and pigment recovery
- Effluent treatment
◆ Nuclear industry

  ✓ Radioactive mud concentration
  ✓ Washing wastewater decontamination
  ✓ Effluent treatment

◆ Mechanicals and metal treatment

  ✓ Degreasing baths recovery (oil/water separation)
  ✓ Cutting fluid recovery
  ✓ Clarification of precision part rinse water
  ✓ Vehicle wash-water recycling
  ✓ Bilge water treatment
  ✓ Effluent treatment (oil/water separation, COD reduction)

◆ Others

  ✓ Oxygenation, gas diffusion
  ✓ Cryogenic fluid sterilization
  ✓ Solvent separation

Effluents

◆ Removal of suspended solids
◆ COD, BOD and suspended solids reduction by membrane bioreactor
◆ Industrial laundry wash-water recycling
◆ Oil/water separation
◆ Brine recycling
◆ Cleaning in place (CIP) chemicals clarification for recycling
◆ Solvent recovery
◆ Tank bottom recovery
◆ Effluent treatment for recycling in zero-waste plant
◆ Waste water