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