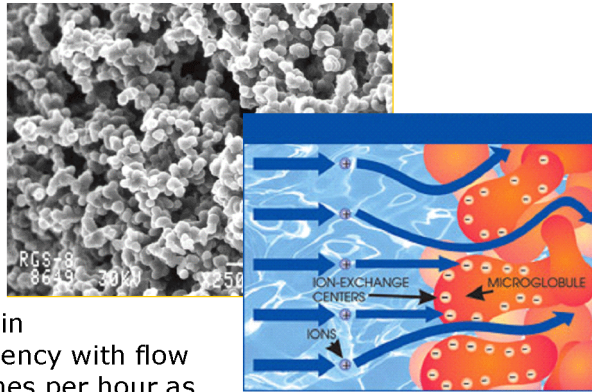


PolywiseSM - A new class of composite materials based on synthesis of etheric oils into polymer structures capable of removing industrial and toxic chemicals and killing bacteria, viruses and fungi in air and fluids.

How does PolywiseSM work?

PolywiseSM is designed to provide the most efficient polymer filtering solution in water and air remediation. The invention is comprised of organic, inorganic and mixed active polymer materials with programmed physical and chemical properties. Etheric oils (oils that easily evaporate) are used as a medium. This allows fully controlled interaction of concentrations of etheric oils within polymer structures at extremely high density and high flow rates. The polymer structures act as chemical, bactericidal, virucidal and fungicidal filters and can regenerate through air or fluid backflow pressure.

PolywiseSM active polymers' sorption rate (where one substance takes up or holds another) is limited only by film-diffusion in contrast to conventional ion-exchangers and adsorbents, where sorption rate is limited by particle-diffusion. The high speed of fluid/air flow reduces hydrodynamic layer thickness on particle surfaces, resulting in higher sorption rates even for sub-micron filters.



The polymers are unmatched in high fluid/air throughput efficiency with flow rates of up to 3000 bed volumes per hour as compared to only 30-40 for competitive products.

PolywiseSM can execute multiple filter functions at the same time: sorption & filtration; sorption & coalescence; degassing and many others. It represents a new class of materials where organic and inorganic polymer materials are polymerized into a uniform programmable structure. The polymers are capable of reducing the cost of ion and electron exchange, as well as complexation (staying in solution), coalescence (mixing diverse compounds) and redox (oxidation-reduction). The latter are extremely important when bactericidal, virucidal and fungicidal properties are required.

What can PolywiseSM be used for?

A variety of unique applications have been developed for the removal of nitrates, chromates, boron, heavy metals, radionuclide, dissolved gasses, organic micro pollutants, bacteria and viruses. The invention has significant advantages when used for water filtration, purification and disinfection, ion-exchange, water softening, purification from organic poisons, biological contaminations, chromatography, bacteria transportation, benzene purification (lead), water desalination with thermal regeneration, aquaculture, flammable and explosive liquids storage and transportation, and waste management.

Examples of **PolywiseSM** applications include:

- ⊕ Radionuclide removal;
- ⊕ Metals extraction from sea water;
- ⊕ Brine-free water softening;
- ⊕ Boron removal from groundwater, wastewater or from sea water;
- ⊕ Radium brine-free removal from drinking or waste water;
- ⊕ Pure and super-pure materials production, . semiconductors industry;
- ⊕ Solutions purification from emulsified or dissolved organic matters;
- ⊕ Strong acids and alkalis purification;
- ⊕ Antimony recovery from Copper electrolytes;
- ⊕ Thallium recovery from waste water of Zinc production;
- ⊕ Extraction of Cu, Zn, Cd from industrial effluents;
- ⊕ Solutions for degassing, Emulsions separation; Catalysis in stream;
- ⊕ Desalination with thermal regeneration;
- ⊕ Food oils clarification;
- ⊕ Lubricating oils clarification and purification;
- ⊕ Liquids micro-, super- and ultra-filtration.

How is **PolywiseSM better than existing solutions?**

The technology can perform a wide range of chemical reactions that are impossible at lower service flow rates offered by conventional filters. It can decrease the cost of water filtration by 2 to 10 times, depending on the application and the treated water quality.

It is a truly "programmable" media in that one can "program" filters to target specific contaminants. It also reduces chemical reaction speed by a factor up to 10,000 compared to today's leading technologies using synthetic resins.

Secondary advantages are in lower price/reuse and replacement; ease of binding with other reagents and catalysts; and conformance to standard unit sizes for replacing competing products. A key advantage is the ability to construct polymer matrices into novel solutions such as air absorption surfaces, paints and non-fluid environments.

Where are the market opportunities for **PolywiseSM?**

- ⊕ **Water and air purification** whenever bactericidal, virucidal and fungicidal functions are crucial, such as in anti-bioterrorism applications. Examples include filters for new air-conditioners, coating for existing internal parts of air conditioning units, filtrations units for gas masks, air and water filtration systems, ventilation and others.
- ⊕ Brine-free chemical-based ion-exchange **water softening** solution that is fully compliant with strict new water softening regulations of Water Quality Association (WQA). It is the only ion-exchange softening solution that can be implemented in places where water softening bans are in effect, i.e. California, Michigan and Texas.
- ⊕ **Point of Use** (POU) solutions for Bacteria, Viruses, Fungi, Organic chemical, Chlorine, Perchlorite, Particulate, Cyst, VOC, Iron, Lead, Microorganisms and Manganese Reduction, as well as water taste and odor reduction. Fully compliant with new EU and US regulations.

What is the economic value of PolywiseSM?

Within the United States alone, the water and air purification market size is \$5 Billion. For water softening and ion-exchange, the market size is \$4.4 Billion. The market for POU solutions is in excess of \$2.2 Billion.

PolywiseSM competitive advantages:

Organic and inorganic active polymer materials for water and air purification are hundreds to thousands of times as more efficient compared to synthetic resins produced by companies such as Dow Chemicals, GE, Mitsubishi and Rohm&Haas.

The unprecedented efficiency of the new filtering solutions lies in the proprietary materials technology for synthesizing organic and inorganic polymers with fully controlled physical and chemical properties - it is more than just an active polymer material.

PolywiseSM can create polymers in a variety of materials. The polymer structure is able to precisely control numerous physical and chemical characteristics:

Physical characteristics:

- ⊕ Globule and pore size
- ⊕ Porosity
- ⊕ Controlled 3-D globular structure
- ⊕ Permeability
- ⊕ Mechanical strength

Chemical characteristics

- ⊕ Sorption
- ⊕ Ion-exchange capacity
- ⊕ Electron exchange
- ⊕ Complexation
- ⊕ Affinity characteristics

PolywiseSM reduces chemical reactions' time by a factor of up to 10,000 compared to today's leading technologies of synthetic resins. As a result, it is capable of performing many chemical processes that, until now, were considered to be beyond the reach of modern science. In November of 2005, **PolywiseSM** was selected by a consortium of EU water purification companies as one of the most promising new technologies for water and air filtration.

The technology is under evaluation in a number of countries for brine and boron removal from water, water softening and POU/POE water filtration. Other parties are interested in biological contaminant removal, ion-exchange for desalination, air filtration and industrial chemical removal. It can be used for improving the quality of water supplies prior to use and remediation of waste water after use.

PolywiseSM – transforming the water we use and the air we breathe.