**BIO-Lair for Water Cleanup**

**Porous Ceramic & Bacteria**

- Increases Bacteria Concentrations with BIO Media to Accelerate Cleanup
- Use strong Bacteria Blends
- Breakdown of Nitrogen & Organics
  - Natural Approach – No Chemicals
  - Media Can Last for years
BIO - Porous Media
Bacteria Multiplier

- Surface Area >2,000,000 m²/m³
  - Support Large Colonies of Bacteria

- Hierarchical Pore Structure
  - Easy water flow at low pressure

- Cost-effective
  - Less media Needed

- Better than Other Media

<table>
<thead>
<tr>
<th>Pentair - Aquatic Ecosystems Catalog</th>
<th>Ship Weight</th>
<th>Comparision</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>M² / M³</td>
<td>Kg</td>
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<tr>
<td>Spiorax</td>
<td>268,990</td>
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<tr>
<td>BIO-FILL</td>
<td>820</td>
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<td>BIO-BALL</td>
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<td>BIO-BARREL</td>
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<td>BIO-STRATA</td>
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<td>Meta BIO Media</td>
<td>2,296,257</td>
<td>6.8</td>
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<tr>
<td>Meta BIO Media</td>
<td>BIO - porous ceramic (Ca,DN)</td>
<td>2,296,257</td>
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</table>
Benefits of BIO-Media for Waste Water

- Higher Effective Biomass
  Has >50 kg/M³ in single microbe layer
  Provides over 60,000 mg/L bacteria

- Less Media to Treat same Water

- Contaminants Drop to Low Levels
  BOD, TKN, Phosphorus < 3mg/L typical
  simultaneously at wider temperatures

- Larger Bacteria Population
  Stabilizes process against load changes
  Resistant to hydraulic or organic shocks

- Reduced Sludge Production
  Bacteria is retained longer by media

- Improves Sludge Volume Index (SVI)
  More concentrated sludge in clarifier
BACTERIA
Natural Removal of Contaminants

• Bacteria Present in Every Environment
  Most are Beneficial - Nature’s Way to
  Control Contaminants

• Bacteria Blends Accelerate Breakdown
  • Non-pathogenic bacteria: 
    *Bacillus & Phenibacillus* strains
    Heterotrophs hungry for organics
  • Large concentrations of active bacteria
  • Enzymes target breakdown of fats, proteins, cellulose to small molecules
  • Excellent at Removing Nitrogen
    • Higher carbon uptake also requires nitrogen
    • Utilize nitrite/nitrate oxygen when levels low
    • Can assimilate nitrites when ammonia low
**BIO-Lair + Bacteria**

Special Blends of Bacteria

*microbial and probiotic water treatment*

- Fast Growing Bacteria Lowers Ammonia
- Enzymatic Bacteria breaks down Proteins, Oils, Organics and most Disease Pathogens
- Probiotic Bacteria Strengthen Digestive Track in fish & shrimp to Fight Diseases
- Environmentally Safe Formula

**BIO-Lair Porous Ceramics**

- Sustains High Concentration of Bacteria that is 5 times higher or more
- Surface for Bacteria Multiplication is over 8,000 m²/Kg or 40,000 ft²/lb – 100 x higher
- Holds weight in water to protect bacteria
- Less Needed than other products
Healthy Lakes
Blue-Green Algae
Bacteria + BioLair

- **Bacteria Breaks Down Cyanobacteria** *(blue-green algae)*
  - Microcystin Toxins are not created - health risk avoided
  - Eutrophication (oxygen depletion) reduced
  - Compounds affecting taste of fish do not form

- **BIO-Lair Sustains High Bacteria**
  - This reduces Nutrient Levels
  - Out-Competes Cyanobacteria

  Over 15,000 mg/L (versus norm of 2,500 mg/L)
  Biologically Ties Up Nitrogen and Phosphorus