Chemical-Free Water Purification Since 1993:

Photo-Cat is a chemical-free process that destroys organic contaminants using a TiO₂ slurry-based photocatalytic process to purify or detoxify water. Photo-Cat removes chemical contaminants (such as 1,4-dioxane), biologicals, viruses, oocysts, EDCs, PPCPs, sub-micron particulate, metal and can reduce bromate back to bromide. Photo-Cat has an established history of regulatory compliance since 1994 as it is the solution to the challenging MOTCO Superfund Site.

Benefits include:
- the strongest oxidation potential of all AOPs
- a unique reductive pathway for recalcitrant compounds
- biological destruction/filtration
- significant advantage in efficiency, cost and complexity reduction

Photo-Cat lifecycle costs are significantly less than conventional technologies such as activated carbon, UV ozone, UV peroxide, chemical oxidation, air stripping with off-gas treatment, and reverse osmosis. Photo-Cat is the economical choice for multi-year projects with complex water challenges.

This fully automated process can purify water to very high standards that exceed drinking water standards. Photo-Cat is essentially a solid state, automated device that operates unattended, with service intervals exceeding 20,000 hours.

Differentiation Between AOP & AOP+

Do not confuse the Photo-Cat process with other AOP processes.

### Conventional vs. AOP+

<table>
<thead>
<tr>
<th>Conventional</th>
<th>(eV)</th>
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</thead>
<tbody>
<tr>
<td>UV/O3</td>
<td>2.8</td>
</tr>
<tr>
<td>UV/Peroxide</td>
<td>2.8</td>
</tr>
<tr>
<td>Ozone</td>
<td>2.07</td>
</tr>
<tr>
<td>Cavitation</td>
<td>2.8</td>
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<tr>
<td>E Beam</td>
<td>2.8</td>
</tr>
<tr>
<td>Chemical</td>
<td></td>
</tr>
<tr>
<td>- Hydrogen Peroxide</td>
<td>1.77</td>
</tr>
<tr>
<td>- Permanganate</td>
<td>1.67</td>
</tr>
<tr>
<td>- Chlorine Dioxide</td>
<td>1.50</td>
</tr>
<tr>
<td>- Chlorine</td>
<td>1.36</td>
</tr>
<tr>
<td>- Fluorine</td>
<td>3.05</td>
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<tr>
<td>Etc.</td>
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<table>
<thead>
<tr>
<th>AOP+</th>
<th>(eV)</th>
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</thead>
<tbody>
<tr>
<td>Photo-Cat</td>
<td>3.18-4.8</td>
</tr>
</tbody>
</table>

- Multiple Destruction Pathways
- Oxidation & Reduction
- Not Hydroxyl Radical Dependent
- Strongest Oxidation Potential
- Multi-barrier
- Chemical Free
- CAPEX & OPEX → Cost Reduction
- Purifies Contaminants Others Can NOT

Photo-Cat has the strongest oxidizing potential of any commercially available AOP process and will destroy contaminants of concern that other AOPs can not.

Applications:

Municipal, Industrial, Oil & Gas, Marine, Food & Beverage

- Drinking Water
- Groundwater Remediation
- Disinfection & Sterilization
- Industrial Process Wastewater
- High Purity Water
- Bilge & Ballast Water
- RO Feed & Polish
- Reuse / Recharge
- Zero Discharge / Closed Loop
Simple & Efficient:
- No catalyst loss - continuously recovers all catalyst, 24/7 duty. Catalytic process reduces energy requirements. Quiet
- No wipers, No membrane cleaning, No off gas. No waste generated. No UVT dependence. No chemical oxidants like peroxide or ozone. No Carbon Requirement.

Automated:
- Audited not Operated. SCADA/PLC programmed operation
- Digital service manual online; Remote monitoring, control, and data logging
- Automatic fault detection and recovery, 0 to 100% turn down capability

Ability to Treat:
- Insensitive to dissolved solids and opaque fluids. Not inhibited by turbidity, UVT or pH levels
- Not affected by pressure, temperature, alkalinity
- Operates with water containing iron and other metals

Manufacturing Excellence:
- Corrosion resistant. High-grade stainless-steel construction. NEMA 4 rating
- Plug & Play installations
- Highly reliable using highly developed standard, off the shelf components

Photo-Cat Models:

Sizing: Is the product of Flow X Rate Constant (Energy/Volume).
The Next Step Is to Pilot:

Why Photo-Cat AOP+: Features & Benefits

✅ Better Water at Lower Cost
✅ The Platform is the Plant
✅ Removes & Destroys Chemicals
✅ Removes Color, Taste & Odor
✅ Removes Pb, Hg, Cr6
✅ Disinfects & Sterilizes
✅ Reduced Complexity
✅ Broad Temperature & Pressure Range
✅ Longer Service Interval
✅ Lower Cost Structure
✅ >99% Online Duty
✅ NSF ANSI 61
✅ Reduced Complexity
✅ > 25 Year Design & Membrane Life
✅ 0 to 100% Turndown Capability
✅ Generic Off the Self Parts
✅ Promotes Sustainability

❌ No Annual Lamp Replacement
❌ No Wiper or Quartz Replacement
❌ No Hydrogen Peroxide or Stabilizer Residuals
❌ No Bromate Production
❌ No Chemical Oxidant Storage
❌ No UV T Dependence
❌ No Pre-Treatment Requirements
❌ No THM or HAA Issues
❌ No Generated Waste
❌ No Noise
❌ No Off Gas