KATHON™ 7 TL Antimicrobial
Solid Biocide for Industrial Water Treatment

General

KATHON™ 7 TL Antimicrobial provides service companies with a safer handling, non-retrievable, solid form of KATHON antimicrobial for small and medium sized cooling water systems. The new solid tablets are individually wrapped with a water-soluble film, dissolve rapidly with no residue, significantly reduce contact with the active ingredients and provide the same trusted performance as liquid KATHON antimicrobials.

Structure

5-chloro-2-methyl-4 isothiazolin-3-one (CMIT)  2-methyl-4 isothiazolin-3-one (MIT)

Physical Properties

The following are typical properties of KATHON 7 TL Antimicrobial; they are not to be considered product specifications.

- Total isothiazolone active: 7%
- Magnesium salts: 82%
- Water: 11%
- Appearance: White to off-white color
- Weight: 200 gm (0.44 pound tablet)
- Width: 3.13 inch (7.9 cm)
- Height: 1.25 inch (3.2 cm)
- Water soluble: Soluble
- pH: ~4 (10% dilution)
- Odor: Mild

Features and Benefits

- Improved Safety/Handling: reduced exposure potential (no splashing, spills, leaks, dust)
- Greener Technology: no solvents, no metals, no drum disposal
- More Concentrated: 7% active for small-medium systems = reduced service company transportation costs (vs 1.5% liquids)
- Dissolves Fast: Individually wrapped in water-soluble film. Easy to use for slug dose treatment
- Non-Retrievable: dissolves completely with no residue
- Compatible: non-reactive with WT additives and low corrosion potential (metal/concrete)
- Cost Effective: competitive cost to treat economics
- Trusted Performance: same efficacy as KATHON liquids

Applications/Directions for Use

For the control of microbial biofilms, bacteria, algae, and fungi in:
industrial process water systems, industrial recirculating water cooling towers, industrial recirculating closed loop water cooling systems, brewery pasteurizers, can warmers, retort water systems, industrial scrubbing systems, evaporative condenser water systems, hydrostatic sterilizer water systems, air conditioner/refrigeration condensate water systems, coal slurry systems, immersion ultrasonic tank water, laboratory equipment water baths and influent water filtration systems.
Note: Tablets individually wrapped in water soluble packaging are ready for use and should not be removed from the protective film. This protective film will dissolve in approximately five minutes. Place KATHON™ 7 TL Antimicrobial tablets in the mesh bag holder provided (or equivalent) and suspend/float it in the water so the tablet is completely submerged. Additional holders may be obtained from the Dow Chemical Company. KATHON 7 TL Antimicrobial tablets are best used in the basin of the cooling water system at a location to insure adequate flow over the tablets. Alternatively, the tablets may be added directly to the sump or placed in a side-stream feeding device which recirculates water within the system. Avoid areas of low flow or stagnant locations.

KATHON 7 TL Antimicrobial tablets are dosed to provide from 0.5 to 13 ppm active ingredient, depending on the severity of contamination. Badly fouled systems should be cleaned before treatment is begun. KATHON 7 TL Antimicrobial tablets may be dosed once to twice per week, or as needed. This corresponds to one tablet per 285 gallon (1.1 m³) and 7,500 gallon (28 m³) for 12 and 0.5 ppm active antimicrobial, respectively.

Typical dose levels for KATHON 7 TL Antimicrobial in non-fouled systems are 1-5 ppm of isothiazolone active. Higher levels are required for more heavily fouled systems. One tablet (200 gram) added per 3,750 gallons (28 cubic meters) will provide 1.0 ppm of total antimicrobial active and one tablet (200 gram) per 750 gallons will yield 5.0 ppm active. The following table shows the typical biocide levels that may be achieved by adding one or more tablets to a variety of recirculating water volumes.

**Industrial wastewater treatment systems and sewage systems**
KATHON 7 TL Antimicrobial is recommended for the control of microbial biofilms, bacteria, fungi, and algae in industrial wastewater treatment and sewage systems. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. USE LEVELS = 0.5-13 ppm active.

**Air washer systems**
KATHON 7 TL Antimicrobial is recommended for the control of microbial biofilms, bacteria, fungi, and algae in air washers. Add to the air washer sump or chill water sump to insure uniform mixing. For use only in systems that maintain effective mist-eliminating components. USE LEVELS = 0.5-13 ppm active.

**Oil field injection waters**
KATHON 7 TL Antimicrobial is recommended for the control of microbial biofilm-forming and sulfate-reducing bacteria in oil and gas field water systems, including enhanced recovery injection fluids, drilling, fracturing and completion fluids. USE LEVELS = 1-5 ppm active.

<table>
<thead>
<tr>
<th>Volume Dose</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>285 gal</td>
<td>500 gal</td>
</tr>
<tr>
<td>1 Tablet</td>
<td>13</td>
</tr>
<tr>
<td>2 Tablets</td>
<td></td>
</tr>
<tr>
<td>3 Tablets</td>
<td></td>
</tr>
<tr>
<td>4 Tablets</td>
<td></td>
</tr>
<tr>
<td>6 Tablets</td>
<td></td>
</tr>
<tr>
<td>8 Tablets</td>
<td></td>
</tr>
</tbody>
</table>

Shaded areas outside EPA dose range
<table>
<thead>
<tr>
<th>Volume Dose</th>
<th>1.1 m³</th>
<th>2 m³</th>
<th>5 m³</th>
<th>7 m³</th>
<th>10 m³</th>
<th>15 m³</th>
<th>20 m³</th>
<th>30 m³</th>
<th>40 m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tablet</td>
<td></td>
<td>13</td>
<td>7</td>
<td>2.8</td>
<td>2</td>
<td>1.4</td>
<td>0.9</td>
<td>0.7</td>
<td>0.5</td>
</tr>
<tr>
<td>2 Tablets</td>
<td></td>
<td>14</td>
<td>5.6</td>
<td>4</td>
<td>2.8</td>
<td>1.9</td>
<td>1.4</td>
<td>0.9</td>
<td>0.7</td>
</tr>
<tr>
<td>3 Tablets</td>
<td></td>
<td></td>
<td>8.4</td>
<td>6</td>
<td>4.2</td>
<td>2.8</td>
<td>2.1</td>
<td>1.4</td>
<td>1.1</td>
</tr>
<tr>
<td>4 Tablets</td>
<td></td>
<td></td>
<td>11.2</td>
<td>8</td>
<td>5.6</td>
<td>3.7</td>
<td>2.8</td>
<td>1.9</td>
<td>1.4</td>
</tr>
<tr>
<td>6 Tablets</td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>8.4</td>
<td>5.6</td>
<td>4.2</td>
<td>2.8</td>
<td>2.1</td>
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<tr>
<td>8 Tablets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11.2</td>
<td>7.5</td>
<td>5.6</td>
<td>3.7</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Shaded areas outside typical dose range

**KATHON 7 TL Antimicrobial Tablets Dosing Options**
- Plastic mesh bag
  - add tablets to bag and suspend in flowing area of sump
- Side-stream feeders
  - close inlet flow valve, add tablets to central reservoir, re-open flow valve
- Floating feeders
  - open lid, add tablets to reservoir, replace lid and suspend in flowing area
- Direct addition to sump
  - add to lower basin directly (avoid deep sumps with sediment)

**Antimicrobial Monitoring**
- HPLC is the standard analytical method for analysis of isothiazolone active levels in KATHON™ 7 TL Antimicrobial
- Dow Microbial Control is introducing a field test kit to measure KATHON 7 TL Antimicrobial active levels in industrial process waters. Kits may be purchased by contacting your local sales account manager or online at dowmicrobialcontrol.com

**Efficacy**
- KATHON WT liquids and KATHON 7 TL Antimicrobial tablets are made from the identical raw materials and contain the exact same ratios of CMIT and MIT.
- Concentrated KATHON 7 TL Antimicrobial shows identical efficacy to diluted products
- KATHON 7 TL Antimicrobial efficacy is summarized below:
  - Broad spectrum (bacteria, algae, fungi)
  - Effective vs key problem-causing organisms
    - *Legionella pneumophila* and other spp.
    - Sulfate Reducing Bacteria (ex., *Desulfovibrio*)
  - Controls microbial biofilms (single sp. and complex)
  - Rapidly (5 min) inhibits microbial metabolism (dehydrogenase enzymes, respiration, ATP, reproduction) and kills within 24 hours

**KATHON 7 TL Antimicrobial Lab Dissolution Study**
- Synthetic cooling water:
  - pH 8.2; 32° C
  - 500 ppm hardness
  - 100 ppm alkalinity
  - 10 ppm acrylate scale inhibitor
• 55 gallon (210L) volume  
• Moderate agitation / mixing  
  – 5 gal (19L) /min recirculation (from bottom of drum)  
  – 10 min recirculation rate  
• Weight loss measured for tablet (7% active) in mesh bag just below liquid surface  
• Laboratory studies in 55 gallon tanks showed rapid dissolution of 200 gm (7%) tablets within 30-45 min  
• No visible solid or wrapper residue remained  
• Dissolution rate increased with increasing temperatures

**Corrosion Testing**

No adverse reaction with repeated exposure to common materials of construction

Tablets placed on coupons continuously for 28 days at 30°C with daily water addition.

No significant corrosion on galvanized steel, aluminum, stainless steel or concrete. Slight staining on selected materials.

<table>
<thead>
<tr>
<th>Test Samples</th>
<th>Weight Loss (g)</th>
<th>Corrosion Rate (mpy)</th>
<th>Visual Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galvanized Steel</td>
<td>0.0036</td>
<td>0.2</td>
<td>Stained and loss of luster, OK</td>
</tr>
<tr>
<td>Aluminum 1100</td>
<td>0.0001</td>
<td>0.0</td>
<td>Light staining, OK</td>
</tr>
<tr>
<td>Stainless Steel 304L</td>
<td>0.0001</td>
<td>0.0</td>
<td>Light staining, OK</td>
</tr>
<tr>
<td>Stainless Steel 316L</td>
<td>0.0000</td>
<td>0.0</td>
<td>OK, no change</td>
</tr>
<tr>
<td>Concrete</td>
<td>–</td>
<td>–</td>
<td>OK, no change</td>
</tr>
</tbody>
</table>

**Packaging**

200 gm KATHON™ 7 TL Antimicrobial tablet covered with a water-soluble outer wrap

Each tablet labeled with name, active ingredient content, and hazard warning

Multiple KATHON 7 TL Antimicrobial tablets packaged in resealable plastic bags, 50-60 tablets packaged in 5 gallon (19L) pails
| Safe Handling | • KATHON™ 7 TL Antimicrobial tablets are significantly safer vs liquids  |
|              |   – No spills, splashes, leaks or drips                         |
|              |   – At 7% active CMIT/MIT, the solid is still corrosive to skin and eyes and a skin sensitizer |
|              |   – The outer water-soluble wrapper is a primary barrier, but handle solids with appropriate PPE |
|              |   – May be tears in wrapper or small particles/dust from shipping |
|              |   – Do not remove tablets from outer wrappers                    |
|              | • Conditions to avoid                                           |
|              |   – Placing tablets directly on work surfaces without containment |
|              |   – High humidity or getting tablets wet directly                 |
|              | • Do NOT open zippered bags if the tablet wrapper is torn or damaged or if tablets are noticeably broken or dusty |

| Spills and Disposal | • Dispose of zippered bags in biocide-contaminated waste (do not recycle) |
|                    | • If a tablet breaks and a solid spill occurs:                     |
|                    |   – Avoid inhalation of any tablet particulates/dust              |
|                    |   – Clean up broken solid pieces and discard in biocide-contaminated lab waste |
|                    |   – Wipe spill area with a solution of 5% bleach (sodium hypochlorite) + 5% sodium bicarbonate. Wait 30 minutes and rinse with tap water 3 times. |

| Product Stewardship | Dow Microbial Control encourages its customers to review their applications of Dow Microbial Control products from the standpoint of human health and environmental quality. |
|                    | To help ensure that Dow Microbial Control products are not used in ways for which they are not intended or tested, Dow Microbial Control personnel are willing to assist customers in dealing with ecological and product safety considerations. Contact your representative if you need any assistance or information. |
|                    | When considering the use of any Dow product in a particular application, review the latest Safety Data Sheet and country-specific product label to ensure the intended use is within the scope of approved uses and can be accomplished safely. |
|                    | Before handling any of the products mentioned in the text, obtain available product safety information and take necessary steps to ensure safety of use. |
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