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# ZINC OMADINE

# POWDER

## INDUSTRIAL MICROBIOSTAT

ACTIVE INGREDIENT:
Zinc 2-pyridinethiol 1-oxide* ..... 95%
INERT INGREDIENTS: ..... 5%
*Zinc Pyrithione

KEEP OUT OF REACH OF CHILDREN

## WARNING

**SEE FIRST AID STATEMENT AND ADDITIONAL PRECAUTIONS ON SIDE PANELS**

**NET CONTENTS:**

_____Lbs.(_____kg.)


**CHEMICAL SPECIALTIES**
**OLIN CORPORATION**
**120 LONG RIDGE ROAD**
**STAMFORD CONNECTICUT 06904**



**EPA Reg. No. 1258-840** **EPA Est. No. 1258-NY-3**


**DIRECTIONS FOR USE**
**GENERAL CLASSIFICATION**
It is violation of Federal Law to use this product in a manner inconsistent with its labeling.

## STORAGE AND DISPOSAL

Do not store above 100°F (38°C). Store in a dry place. Keep container tightly closed when not in use. Do not store with strong oxidizing agents or strong (concentrated) acids.

Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. Unused contents should be disposed of in a landfill approved for pesticides. Do not reuse empty container. Triple rinse with water and: (1) if container is metal, offer for recycling, reconditioning or disposal in approved landfill; (2) if container is plastic, dispose of in an incinerator (do not breathe fumes) or landfill approved for pesticide containers. Consult Federal, State, or Local disposal authorities for approved alternate procedures.

DIRECTIONS FOR AQUEOUS METAL COOLANT AND CUTTING FLUID SOLUTIONS(SOLUBLE OIL, SEMISYNTHETIC, SYNTHETIC): Zinc Omadine Powder: To inhibit bacterial growth in soluble oil, semi-synthetic, or synthetic metalworking coolant and cutting fluids add an initial dose of 75 ppm Zinc Omadine Powder (0.75lbs Zinc Omadine Powder to 10,000 lbs of solution) to the solution and repeat this dosage every 25 days or as needed.

Zinc Omadine Powder can be used at fluid to water ratios of 1:10 to 1:100. Zinc Omadine Powder should be added to the reservoir (sump) containing the fluid after it is put into use. The fluid should be circulated after addition to ensure mixing.

Contaminated fluid systems should be cleaned prior to the initial addition of Zinc Omadine Powder. Drain the system; clean with a cleaner designed for this purpose; rinse with water and refill with fresh fluid containing Zinc Omadine Powder according to the above directions.

Frequent checks (at least once a week) of the bacterial population in the system should be made using standard microbiological plate count procedures or any of the commercial "dip-stick" type devices. When the bacterial count reaches $10^7$ organisms per ml add additional Zinc Omadine Powder according to the above directions. If this does not reduce the bacterial count below the above values in 12-24 hrs the fluid should be discarded and replaced after cleaning the system. Add Zinc Omadine Powder to the fresh fluid according to the above directions.

When adding fresh, diluted fluid to compensate for dragout or other lossed, add Zinc Omadine Powder to the make-up fluid according to the directions.

**DIRECTIONS FOR USE Continued:**

**Mildew control for PVC plastic (non-food plastic).** To inhibit mildew growth a dosage of 0.11% by wt. of Zinc Omadine Powder is recommended. It may be added at any time during the formulation procedure. Use care to avoid clumping.

**PRECAUTIONARY STATEMENTS**
**HAZARDOUS TO HUMANS AND DOMESTIC ANIMALS**

**WARNING:** May be fatal if swallowed. Causes eye irritation. Do not take internally. Avoid contact with skin. Do not get into eyes.

**FIRST AID**
**(PRACTICAL TREATMENT)**

In case of contact immediately flush eyes or skin with plenty of water for at least 15 minutes. For eyes call physician. Remove and wash contaminated clothing before reuse.

If swallowed, drink plenty of water. Call a physician.

**CHEMICAL HAZARDS**

Do not store with or mix with strong oxidizing agents or strong (concentrated) acids. In case of contamination, do not reseal container. If possible, isolate container in open air or well ventilated area. Fumes caused by contamination may be hazardous

**ENVIRONMENTAL HAZARDS:** This product is toxic to fish. Do not discharge into lakes, streams, ponds, or public waters unless in accordance with an NPDES permit. For guidance contact the regional office of EPA.

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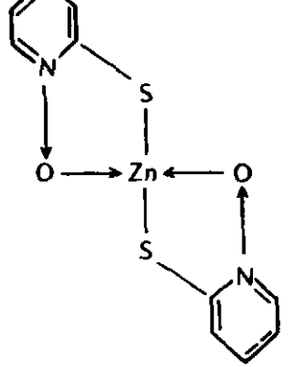

**Molecular Formula**

$C_{10}H_8N_2O_2S_2Zn$

**Ingredients**

| | |
|---|---|
| Active – Zinc Pyrithione (%) (zinc 2-pyridinethiol-1-oxide) | 95 |
| Inert (%) | 5 |

**Specifications**

| | |
|---|---|
| Zinc Pyrithione, min (%) | 95 |
| Sodium Salts, max (%) | 3.5 |
| Water, max (%) | 1.0 |
| Other Pyridine Derivatives, max (%) | 0.5 |



**Typical Physical Properties**

| | |
|---|---|
| Molecular Weight | 317.7 |
| Color | off-white |
| Form | free-flowing powder |
| pH, 10% active slurry in neutral distilled water | 6.5–7.5 |
| Bulk Density (g/ml) | ~0.35 |
| Specific Gravity @ 25°C | 1.782 |
| Melting Point, min Decomposes (°C) | 240 |

Zinc Omadine Powder

- exhibits pronounced growth inhibiting activity against a broad spectrum of both Gram negative and Gram positive bacteria.
- inhibits the growth of fungi, both yeast and mold.
- is a chelating agent.
- should not be used in the presence of any chlorine residuals.

**EPA Registration**

Zinc Omadine powder is registered with the Environmental Protection Agency (EPA) for use in inhibiting the growth of bacteria in aqueous metal coolant and cutting fluid solutions and for inhibiting mildew and pink stain in PVC plastic. (EPA Registration No. 1258-840)

**Directions for Registered Uses**

*Aqueous Metal Coolant and Cutting Fluid Solutions* – To inhibit bacterial growth in soluble oil, semisynthetic, or synthetic metalworking coolant and cutting fluids add an initial dose of 75 ppm Zinc Omadine Powder to the solution (0.75 lbs. Zinc Omadine Powder to 10,000 lbs. of solution) and repeat this dosage every 25 days or as needed.

Zinc Omadine Powder can be used at fluid to water ratios of 1:10 to 1:100. Zinc Omadine Powder should be added to the reservoir (sump) containing the fluid after it is put into use. The fluid should be circulated after addition to ensure mixing.

Contaminated fluid systems should be cleaned prior to the initial addition of Zinc Omadine Powder. Drain the system; clean with a cleaner designed for this purpose; rinse with water and refill with fresh fluid containing Zinc Omadine Powder according to the above directions.

Frequent checks (at least once a week) of the bacterial population in the system should be made using standard microbiological plate count procedures or any of the commercial "dip-stick" type devices. When the bacterial count reaches $10^7$ organisms per ml add additional Zinc Omadine

ZINC OMADINE® POWDER INDUSTRIAL MICROBIOSTAT

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# ZINC OMADINE®IN METALWORKING FLUIDS

The active ingredient in Zinc Omadine is zinc 2-pyridinethiol-1-oxide, also known as zinc pyrithione. Zinc Omadine is available as a powder (95% minimum assay) and as an aqueous dispersion (48% minimum assay). Both forms are registered with The United States Environmental Protection Agency (EPA) "for use in inhibiting the growth of bacteria in aqueous metal coolant and cutting fluid solutions" *(EPA Reg. Nos.: powder, 1258-840; dispersion, 1258-841).*

Aqueous-based metalworking fluids, whether of the "soluble oil," "semi-synthetic" or "synthetic" type, contain chemicals which, together with the water present, provide excellent nutrient sources for microorganisms of all types and for bacteria in particular. These organisms, if allowed to proliferate, can cause odors, deterioration of the fluid, and dermatitis among the machine operators.

The cost of cleaning a fluid system and refilling with fresh fluid is an expensive undertaking. Moreover, in today's regulatory climate, disposing of the used fluid can be very expensive. For these reasons the use of a microbiostat (preservative) on a regular basis in metalworking fluid systems (along with a rigorous housekeeping program) will usually result in a longer life for the fluid and savings in replacement, cleaning, and disposal costs.

The data presented here indicate that Zinc Omadine is an effective microbiostat when used in aqueous-based metalworking fluid systems according to directions.

**Experimental**

Zinc Omadine 48% dispersion was evaluated under actual use conditions in a 4000- and a 9600-gallon system both filled with a soluble oil fluid. During the test, plate counts were made periodically to determine the total number of bacteria and the number of coliforms present in the fluids. Tests were also done to determine the presence of sulfate reducing organisms. In addition to the microbiological tests, pH changes were determined and, in one case, a rust test was performed. The results of these tests and the dosage schedules are given in Tables 1 and 2.



**Table 1**

**System Volume: 9600 gal**
**Fluid: Soluble Oil Emulsion**
**Dilution: 24:1**

| Day | | pH | Coliform/ml | Total Count/ml | Sulfate Reducers |
|---|---|---|---|---|---|
| 0 | ▶ | Fluid discarded, system cleaned and refilled. No biocide added. | | | |
| 2 | | 9.8 | 26,000 | 16,900,000 | Trace |
| 9 | | 8.75 | 54,000 | 23,200,000 | Moderate |
| 13 | ▶ | Added 13 pounds Zinc Omadine 48% dispersion[1] | | | |
| 16 | | 9.2 | 20,000 | 614,000 | None |
| 37 | | 8.8 | 96,800 | 26,000,000 | Moderate |
| 40 | | 8.85 | 91,000 | 57,500,000 | Moderate |
| 41 | ▶ | Added 12 pounds Zinc Omadine 48% dispersion[1] | | | |
| 44 | | 8.9 | 2,100,000 | 5,060,000 | None |
| 61 | | 8.95 | 122,000 | 21,500,000 | None |
| 68 | | 8.95 | 21,000 | 25,600,000 | None |
| 72 | | 8.8 | 7,400 | 40,800,000 | Moderate |
| 77 | | 8.7 | 3,300 | 36,500,000 | Moderate |
| 81 | | 8.8 | 300 | 31,900,000 | Heavy |
| 88 | | 8.6 | 1,400 | 25,000,000 | Heavy |

[1]13 pounds and 12 pounds of Zinc Omadine 48% dispersion are equivalent in active ingredient content to 6.6 pounds and 6.1 pounds, respectively, of Zinc Omadine powder.

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ZINC OMADINE®IN METALWORKING FLUIDS

**Table 2**

**System Volume: 4000 gal**
**Fluid: Soluble Oil Emulsion**
***Dilution: 20:1***

| Day | pH | Coliform/ml | Total Count/ml | Sulfate Reducers | Rust Test% |
|---|---|---|---|---|---|
| 0 | 8.6 | 12,000 | 48,000,000 | Positive | 8 |
| 6 ▶ | Added 5 pounds Zinc Omadine 48% dispersion[1] | | | | |
| 14 | 9.0 | Trace | 5,000,000 | None | 1 |
| 21 | 8.9 | None | 7,000,000 | None | 2 |
| 34 | 8.9 | 12,000 | 27,000,000 | Trace | 4 |
| 36 ▶ | Tramp oil reached 4%. System shut down, skimmed, and made up to proper level. | | | | |
| 39 ▶ | Added 4.1 pounds Zinc Omadine 48% dispersion[1] | | | | |
| 48 | 9.1 | None | 2,000,000 | None | Trace |
| 55 | 8.8 | None | 7,000,000 | None | Trace |
| 62 | 8.9 | None | 22,000,000 | None | 2 |
| 69 | 8.6 | 3,000 | 22,000,000 | None | 2 |

[1]5 pounds and 4.1 pounds of Zinc Omadine 48% dispersion are equivalent in active ingredient to 2.5 and 2.1 pounds, respectively, of Zinc Omadine powder.

**Directions For Use**

To inhibit bacterial growth in soluble oil, semisynthetic, or synthetic metalworking coolant and cutting fluids add an initial dose of 75 ppm Zinc Omadine (active) to the solution (1.5 lbs. Zinc Omadine 48% or 0.75 lbs. Zinc Omadine powder to 10,000 lbs. of solution) and repeat this dosage every 25 days or as needed.

The quantity of Zinc Omadine Powder or 48% Dispersion necessary to give the recommended concentrations in any size system is given in Table 3.

Both Zinc Omadine Powder and Zinc Omadine 48% Dispersion can be used at fluid to water ratios of 1:10 to 1:100.

Zinc Omadine Powder or 48% Dispersion should be added to the reservoir (sump) containing the fluid after it is put into use. The fluid should be circulated after addition to ensure mixing.

Contaminated fluid systems should be cleaned prior to the initial addition of Zinc Omadine Powder or 48% Dispersion. Drain the system; clean with a cleaner designed for this purpose; rinse with water and refill with fresh fluid containing Zinc Omadine Powder or 48% Dispersion according to the above directions.

Frequent checks (at least once a week) of the bacterial population in the system should be made using standard microbiological plate count procedures or any of the commercial "dip-stick" type devices. When the bacterial count reaches $10^7$ organisms per ml add additional Zinc Omadine Powder or 48% Dispersion according to the above directions. If this does not reduce the bacterial count below the above values in 12-24 hrs., the fluid should be discarded and repalced after cleaning the system. Add Zinc Omadine Powder or 48% Dispersion to the fresh fluid according to the above directions.

**Table 3**

**Quantity of Zinc Omadine needed to reach indicated concentration in diluted metalworking fluid[1]**

| | *Amount added to get 75 ppm (active)* |
|---|---|
| *Zinc Omadine 48% dispersion* | |
| Volume per 1,000 gallons | 16½ oz |
| Volume per 1,000 liters | 129 ml |
| *Zinc Omadine powder* | |
| Weight per 1,000 gallons | 10 oz |
| Weight per 1,000 liters | 75 g |

[1]Based on densities of 8.3 lbs/gallon (.992 g/cc) for the diluted fluid and 10 lbs/gallon (1.198 g/cc) for Zinc Omadine 48% dispersion

**Formulation Suggestions**

Zinc Omadine has very little solubility in diluted metalworking fluids. Moreover, its higher density causes it to settle out quickly. For these reasons, it is recommended that either form of Zinc Omadine be added directly to the fluid system after it has been filled with fluid. After addition, the system should be operated for a sufficient time to thoroughly mix the Zinc Omadine with the fluid.

In some instances, a blue or gray color may develop when Zinc Omadine is added to a fluid. This color is due to the presence of ferric ions in the system. Zinc 2-pyridinethiol-1-oxide (the active ingredient in Zinc Omadine) reacts with ferric ions (but not ferric oxide, or metallic iron) to produce ferric-2-pyridinethiol-1-oxide (Ferric Omadine) which is blue. Ferric Omadine is also an active microbiostat.

Additional information on the physical and chemical properties of Zinc Omadine can be obtained from Olin's Product Data Bulletin: "Zinc Omadine and Sodium Omadine." Copies are available on request.

**Toxicology**

The acute oral $LD_{50}$ of Zinc Omadine is 200 mg/kg in male rats. The concentrated dispersion or the neat powder is irritating to the skin but when diluted to concentrations of the order used in diluted metalworking fluids, no irritation has been found. It is not an allergic sensitizer.

Additional toxicity information is available in Olin's Material Safety Data Sheet and Toxicological Summary for Zinc Omadine. Copies are available on request.

**Handling Precautions**

Zinc Omadine powder or 48% dispersion can cause skin and eye irritation from prolonged or repeated contact. Inhalation of Zinc Omadine dust can cause irritation of mucous membranes and the respiratory tract.

Zinc Omadine powder or 48% dispersion should be handled with the same precautions used in handling any industrial chemical. Avoid inhalation, ingestion, or contact with skin or eyes. If spilled on the skin, wash off thoroughly with water. If splashed in the eyes, flush eyes with gently running water for at least 15 minutes. Have eyes checked by a physician.

Keep containers tightly closed. Zinc Omadine 48% dispersion should be thoroughly stirred or the container shaken before use as the Zinc Omadine solid tends to settle out on standing.

Do not reuse empty containers. Destroy by burying in an approved disposal area or by burning. Stay away from smoke or fumes. If spilled do not flush to drain or public water supplies.

**Additional Information**

Copies of the Product and Toxicological Data Bulletins mentioned above, as well as answers to technical questions can be obtained by calling the Chemical Specialties Product Coordinator (203) 356-3347 or by writing Olin Corporation, Chemical Specialties Product Coordinator, 120 Long Ridge Road, Stamford, Connecticut 06904