

PARASITE-S

Formalin (aqueous formaldehyde solution)

For control of External Protozoa and Monogenetic Trematodes on all Finfish and External Protozoans on Penaeid Shrimp; and for control of Fungi on all Finfish eggs.

DESCRIPTION

PARASITE-S is the aqueous solution of formaldehyde gas (this is equivalent to formalin 37% or 37 grams of formaldehyde in 100 mL of solution). U.S.P. grade PARASITE-S contains not less than 37% (by weight) of formaldehyde gas per weight of water and 6 to 14% methanol. In solution, formaldehyde is present chiefly as HO(CH₂O)H. Its molecular weight is 30.93. PARASITE-S is readily miscible with water, methanol, and ethanol and is slightly soluble in ether. It is a clear, colorless liquid (Heyden Newport Chemical Corporation, 1961).

FISH AND SHRIMP TOXICITY STUDIES

The toxicity of PARASITE-S was measured by standard methods in laboratory bioassays with rainbow trout, Atlantic salmon, lake trout, black bullhead, channel catfish, green sunfish, bluegill, smallmouth bass, largemouth bass, and striped bass. The 3, 6, 24 and 96-hour LC₅₀ (lethal concentration for 50% of the animals) values for trout range from 1,230 to 100 µL/L (455 to 37 ppm formaldehyde); for catfish, from 495 to 65.8 µL/L (183 to 24 ppm formaldehyde); for bluegill, from 2,290 to 100 µL/L (847 to 37 ppm formaldehyde); for largemouth bass, the values for 6 to 96-hour LC₅₀ range from 1,030 to 143 µL/L (381 to 53 ppm formaldehyde) (Bill et al., 1977) and for striped bass the values for 6 to 96-hour LC₅₀ range from 940 to 30 µL/L (347 to 11 ppm formaldehyde) (Bills, Marking & Howe, 1993). The 24, 48, 72, and 96-hour LC₅₀ values for penaeid shrimp range from 712 to 235 µL/L (ppm) (Johnson, 1974 and Williams, 1980).

INDICATIONS FOR USE:

- Parasiticide for All Finfish:** for the control of external protozoa (*Chilodonella* spp., *Ichthyobodo* spp., *Epistylis* spp., *Ichthyophthirius* spp., *Ambiphyra* spp., and *Trichodina* spp.), and the monogeneans (*Cleidodiscus* spp., *Dactylogyrus* spp., and *Gyrodactylus* spp.).
- Parasiticide for Penaeid Shrimp:** for the control of external protozoan parasites (*Bodo* spp., *Epistylis* spp., and *Zoothamnium* spp.).
- Fungicide for Finfish Eggs:** for the control of fungi of the family Saprolegniaceae.

DIRECTIONS FOR USE:

1. Parasiticide for All Finfish

Concentrations of Formalin

Aquatic species	Administer in Tanks & Raceways for up to 1 hr (µL/L)*	Administer in Earthen Ponds (Single Treatment) (µL/L)*
Salmon & Trout above 50°F below 50°F	up to 170 up to 250	15-25** *** 15-25** ***
All other finfish	up to 250	15-25** ***

* Microliter per liter (µL/L) = parts per million (ppm).

** Use the lower concentration when ponds are heavily loaded with phytoplankton or fish, to avoid oxygen depletion due to the biological oxygen demand created by decay of dead phytoplankton. Alternatively, a higher concentration might be used if dissolved oxygen is strictly monitored.

*** Although the indicated concentrations are considered safe for cold and warm water finfish, a small number of each lot or pond to be treated should always be used to check for any unusual sensitivity to formalin before proceeding.

2. Parasiticide for Penaeid Shrimp

Concentrations of Formalin

Aquatic species	Administer in Tanks & Raceways for up to 4 hours (µL/L)*	Administer in Earthen Ponds (Single Treatment) (µL/L)*
Penaeid Shrimp	50 to 100**	25***

* Microliter per liter (µL/L) = parts per million (ppm).

** Treat for up to 4 hours daily. Treatment may be repeated daily until parasite control is achieved. Use the lower concentration when tanks or raceways are heavily loaded with phytoplankton or shrimp, to avoid oxygen depletion due to the biological oxygen demand created by decay of dead phytoplankton. Alternatively, a higher concentration might be used if dissolved oxygen is strictly monitored.

*** Treatment may be repeated in 5 to 10 days, if needed.

3. Fungicide for All Finfish Eggs

Concentrations of Formalin

Aquatic species	Administer in Hatchery Systems (µL/L)*
Eggs of all finfish except Acipenseriformes	1000-2000 for 15 minutes**
Eggs of Acipenseriformes	up to 1500 for 15 minutes**

* Microliter per liter (µL/L) = parts per million (ppm).

** Apply in constant flow water supply of incubating facilities. A preliminary bioassay should be conducted on a small subsample of fish eggs to determine sensitivity before treating an entire group. This is necessary for all species because egg sensitivity can vary with species or strain and the unique conditions at each facility.

METHODS OF APPLICATION

APPLICATION TO TANKS AND RACEWAYS - Turn off water supply, provide aeration, apply appropriate amount of PARASITE-S, and thoroughly dilute and mix to assure equal distribution of PARASITE-S. Treat for up to 1 hour for fish and up to 4 hours for penaeid shrimp, then drain the solution and refill the tank with fresh, well-aerated water. While tank is under treatment, adequate oxygen must be present to maintain the fish or shrimp. If needed, aeration should be provided to prevent oxygen depletion. Treatments may be repeated daily until parasite control is achieved.

APPLICATION TO PONDS - Apply greatly diluted PARASITE-S to the pond evenly using a pump, sprayer, boat bailer, or other suitable device to assure even distribution. Allow PARASITE-S to dissipate naturally. Single treatments usually control most parasites, but may be repeated in 5 to 10 days if needed. Treatments for *Ichthyophthirius* should be made at 2-day intervals until control is achieved.

APPLICATION TO EGG INCUBATORS - Apply PARASITE-S into a constant water supply flowing around the eggs. A drip or pressure system should be used and timed. Apply PARASITE-S under the surface of the water flow. Egg tanks may be treated as often as necessary to prevent growth of fungi.

WITHDRAWAL TIME

Zero days.

WARNING

Striped bass have been demonstrated to be hypersensitive to formalin; lethal toxicity has been noted to occur at levels approximately 2-3 times the recommended therapeutic concentration.

DANGER POISON

USER SAFETY WARNINGS

Use Personal Protective Equipment (PPE) including eye, respiratory, and skin protection while handling this product. Refer to the SDS and OSHA regulations (29 CFR 1910.1048) for guidance on the most appropriate PPE equipment. Failure to use PPE may increase the risk of unsafe exposure to formaldehyde.

Exposure to high concentrations of formaldehyde vapor causes severe respiratory irritation which can be life-threatening. Lower vapor levels can cause irritation to the eyes, respiratory tract, and skin. Swallowing formaldehyde can be life-threatening. Formaldehyde is an irritant when splashed on skin or into the eyes. It can cause severe eye damage, even blindness.

Keep out of reach of children.

In laboratory animals, formaldehyde has demonstrated the potential to cause reproductive and developmental toxicities at high dose.

Use only with adequate ventilation. Keep container tightly closed when not in use.

May aggravate a pre-existing asthmatic condition and allergic rhinitis.

Moderate fire and explosion hazard exists when exposed to heat or flame.

Contains methanol - cannot be made non-poisonous. Prolonged exposure to methanol has been associated with reproduction disorders.

May Cause Cancer: Formaldehyde vapor may be carcinogenic if inhaled. Use applicable safety protection. (Note: This drug, used as labeled, does not cause formaldehyde tissue residues in fish).

Employers: Refer to Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1910.1048 for human safety guidance that may be applicable to your specific operation. OSHA's "action level" concentration for airborne formaldehyde is 0.5 part per million (ppm), calculated as an 8 hour time-weighted average (TWA). Use respiratory, skin, and eye protection when needed (refer to OSHA's regulation 29 CFR 1910.1048). OSHA's airborne exposure limits (without use of a respirator) for formaldehyde shall not exceed 1) 0.75 part per million (ppm) as an 8-hour, time-weighted average (TWA) or 2) 2 parts per million (ppm) as a 15-minute, short term exposure limit (STEL). NOTE: The odor of formaldehyde in the air can generally be detected at about 0.5 to 0.8 ppm (range about 0.05 to 1 ppm).

USER EXPOSURE EMERGENCY AID

INHALATION (Breathing): Get medical aid immediately. Remove victim from exposure wearing protective clothing and respiratory protection appropriate to the type and degree of contamination. Move victim to fresh air immediately. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased, induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If no respiratory device is available, perform chest compressions only.

INGESTION (Swallowing): DO NOT induce vomiting. If the person is conscious, dilute, inactivate, or absorb the formaldehyde by giving milk, activated charcoal, or water. Get medical help immediately. If vomiting occurs, keep head lower than hips.

EYE CONTACT: Immediately flush eye(s) with large amounts of water for at least 15 minutes, lifting the lower and upper eyelids occasionally, until no evidence of chemical remains. Seek medical attention immediately. DO NOT allow victim to rub eyes or keep eyes closed for burns to eyes may have a delayed effect.

SKIN CONTACT: Remove contaminated clothing (including shoes) immediately. Wash affected area of body with soap and large amounts of water until no evidence of chemical remains (at least 15 minutes). If there are chemical burns, or appreciable eye or respiratory irritation, get medical help immediately.

PRECAUTIONS

Store PARASITE-S indoors away from direct sunlight, heat, sparks, and open flames, and ventilate storage area. Do not subject PARASITE-S to temperatures below 40°F (4.4°C). PARASITE-S subjected to temperatures below 40°F causes the formation of paraformaldehyde, a substance which is toxic to fish. Paraformaldehyde can be recognized as a white precipitate at the bottom or on the walls of the container.

Tolerance to PARASITE-S may vary with strain and species of fish, eggs and shrimp. While the indicated concentrations are considered safe for the indicated use, a small number of each lot to be treated should be used to check for any unusual sensitivity to PARASITE-S before proceeding.

Under some conditions, fish or penaeid shrimp may be stressed by normal treatment concentrations. Heavily parasitized or diseased fish or penaeid shrimp often have a greatly reduced tolerance to PARASITE-S. Such animals do not tolerate the normal tank treatment regimen the first time they are treated. Therefore, time and dosage may need to be reduced. If they show evidence of distress (by piping at the surface), the solution should be removed and replaced with fresh, well aerated water. Careful observations should always be made throughout the treatment period whenever tank or raceway treatments are made. Treatment should never exceed 1 hour for fish or 4 hours for penaeid shrimp (even if they show no sign of distress), nor should it exceed 15 minutes for fish eggs.

Do not apply PARASITE-S to fish ponds, tanks, or raceways with water warmer than 80°F (27°C) when a heavy bloom of phytoplankton is present, or when the concentration of dissolved oxygen is less than 5 mg/L (ppm). Do not apply to penaeid shrimp ponds when the concentration of the dissolved oxygen is less than 3 to 4 mg/L (ppm). PARASITE-S may kill phytoplankton and can cause depletion of dissolved oxygen. If an oxygen depletion occurs, add fresh, well aerated water to dilute the solution and to provide oxygen.

Because formalin may harm a biofilter, biofilters should be bypassed during treatment, and the system should be flushed and replaced with untreated water before reconnecting the biofilter.

Do not use PARASITE-S in a tank, pond, or raceway in which methylene blue, or other dyes which are absorbed, have been recently used.

ENVIRONMENTAL PRECAUTIONS

Do not discharge the contents of fish treatment tanks into natural streams or ponds without thorough dilution (greater than or equal to 10X). Do not discharge the contents of egg treatment tanks without a 100X dilution. This will avoid damage to PARASITE-S sensitive phytoplankton, zooplankton, and fish populations and avoid depletion of dissolved oxygen.

Formaldehyde is identified by the U.S. Environmental Protection Agency (EPA) as a toxic pollutant and hazardous substance and is required by regulation (40 CFR, Part 122) to be identified as a discharge for NPDES permits for aquatic animal production facilities, aquaculture projects and other facilities. Formaldehyde is subject to SARA Title III, Section 313 reporting.

Use, storage, and disposal of this product must be handled in accordance with applicable local, state and Federal laws.

STORAGE

Recommended storage temperature 59°F (15°C). DO NOT EXPOSE TO DIRECT SUNLIGHT. Store PARASITE-S indoors away from direct sunlight, heat, spark, and open flame, and ventilate storage area. Do not subject PARASITE-S to temperatures below 40°F (4.4°C).

To report suspected adverse events, for technical assistance, or to obtain a copy of the SDS, contact Syndel USA at (360) 384-5898 or www.syndel.com. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.



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