Fish Toxicity [1]

The Forest Service has worked with the United States Geological Service (USGS) for a number of years to develop a fish toxicity test. The work focused on determining the relative sensitivity to wildland fire chemicals of fish and other aquatic species and age classes commonly used for laboratory studies. Young rainbow trout were found to be representative of the most sensitive of this group of aquatic species and as sensitive as the threatened or endangered species that had been studied.

The final test was developed to use 60 days-post-hatch (dph) rainbow trout. The fish were exposed to a series of product dilutions for 96 hours, under static conditions to determine the LC_{50}. All dilutions were prepared using ASTM soft water as it was determined to be the best single representation of water in streams in undeveloped areas.

The LC_{50} is the concentration of product in water that results in the death of 50 percent of the aquatic test specimens within a specified time frame, 96 hours in this case.

The LC_{50}, expressed in milligrams of product in a liter of solution (mg/L), is the value reported in the fish toxicity summary.

The reported values are for the product concentrates unless otherwise noted. Mix ratios must be considered in addition to the LC_{50} when estimating toxicity in the field. This is especially true when comparing products with very different mix ratios.

For 2-component colored products, the uncolored concentrate, the color concentrate, and the mixed, colored product as used operationally were all tested and reported.

It is important to remember when comparing values, that the lower the LC_{50} value, the greater the toxicity.

It is the goal of the wildland fire agencies to apply these products in a manner that does not allow them to enter waterways. Since this is not always possible and accidents do happen, careful selection of products can be helpful in minimizing harmful effects.

Product Performance Data on next page

1	Standard Test Procedure 1.5 gives instructions for the fish toxicity test.

Fish Toxicity [1]

Water Enhancer Concentrates and Colors

Product	LC_{50} [2]
Barricade II	1400 mg/L
Thermo-Gel 200L, uncolored	122 mg/L
Thermo-Gel AV-B1 (color concentrate only)	>1,000 mg/L
Thermo-Gel 500P	216 mg/L
Firewall II (formerly Wildfire AFG Firewall)	178 mg/L
BioCentral Blazetamer 380	246 mg/L
FireIce 561, uncolored	348 mg/L
FireIce Cool Blue-F (color concentrate only)	>1000 mg/L
Phos-Chek Insul-8	1,051 mg/L
EarthClean TetraKO XL-P,	123 mg/L
FireIce HVB-Fx (1-component, colored)	285 mg/L

Notes:

1	All tests are conducted on Rainbow Trout; 60 days-post-hatch with a 96-hr static exposure. USDA Forest Service Standard Test Procedure 1.5 gives instructions for the fish toxicity test. STP-1.5 is available at http://www.fs.fed.us/rm/fire/wfcs/tests/stp01_5.htm
2	**Lower values indicate greater toxicity.**

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