



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 LC₅₀. The LC₅₀ 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 LC₅₀, 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. Mix ratios must be considered in addition to the LC₅₀ when estimating toxicity in the field. This is especially true when comparing products with very different mix ratios.

It is important to remember when comparing values, that the lower the LC₅₀ 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, careful selection of products can be helpful in minimizing harmful effects.

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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



Fish Toxicity Water Enhancer Concentrates



Product Name (As Evaluated)	LC ₅₀ ¹	
	Soft Water ²	Hard Water ²
Chemdal Aqua Shield 100	280 mg/L	>1,000 mg/L
Barricade II	1400 mg/L	>1,700 mg/L
Thermo-Gel 200L	122 mg/L	115 mg/L
Thermo-Gel 500P	216 mg/L	>1,000 mg/L
Wildfire AFG Firewall II	178 mg/L	157 mg/L
BioCentral Blazetamer 380	246 mg/L	216 mg/L
GelTech Firelce	348 mg/L	1,304 mg/L
Phos-Chek Insul-8	1,051 mg/L	1,776 mg/L

Notes:

1	Lower values indicate greater toxicity
2	The result of exposure in ASTM Soft Water is required; the result of exposure in ASTM Hard Water is provided, when known, for information
3	Rainbow Trout; 60 days-post-hatch; 96-hr; static exposure
4	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