



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, in ASTM soft water (ASTM E 729), 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 and, accidents do happen, careful selection of products can be helpful in minimizing harmful effects.

Product Performance Data on next page

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



Fish Toxicity¹ Class A Foam Concentrates



| Product | LC ₅₀ ² |
|---|-------------------------------|
| FireFoam 103B | 12 mg/L |
| Phos-Chek WD881 | 11 mg/L |
| Pyrocap B-136 | 156 mg/L |
| Phos-Chek WD881C | 17 mg/L |
| National Foam KnockDown | 28 mg/L |
| FlameOut | 130 mg/L |
| Angus Hi-Combat A | 30 mg/L |
| Buckeye Platinum Class A | 39 mg/L |
| Solberg Fire-Brake 3150A | 17 mg/L |
| First Response | 39 mg/L |
| Ansul Silv-Ex Plus (Also sold as Chemguard Direct Attack) | 46 mg/L |
| 1% Bushmaster "A" Class Foam | 17 mg/L |
| Phos-Chek WD881A | 17 mg/L |
| Fomtec Environmental Class A | 78 mg/L |
| Bio-Ex EcoPol-F | 334 mg/L |

Notes:

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| 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 |