

**Manufacturer Submission Procedures for
Qualification Testing of**

Water Enhancer Products

**USDA Forest Service
Missoula Technology and Development Center
Wildland Fire Chemical Systems**

January 2005

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Policy

USDA Forest Service policy (Forest Service Manual 5162.03) states, “Use only evaluated, approved and qualified chemicals.”

The Director, Fire and Aviation Management, Washington Office, has the responsibility to approve chemicals for Forest Service operations and to administer the fire chemical products qualification and evaluation program.

Confidentiality

All information, including the fact that the Forest Service has an agreement with a company or is evaluating a product is confidential until a product is listed on the qualified product list.

The formulation disclosure and other product information provided to the Forest Service as a part of the submission process will be maintained within the Wildland Fire Chemical Systems (WFCS) Program for use during the evaluation process. All sensitive or confidential information is kept in a locked file accessible only to the Program Leader and Project Leader of WFCS. Occasionally the Director of Fire and Aviation, the Branch Chief for Equipment and Chemicals or their staffs will require specific information that is provided in response to direct questions.

Results of testing, progress through the evaluation process, numbers of products being evaluated, and product failures are not discussed except with the submitter’s representatives, identified during the submission process.

Once the product is included in the list of qualified and approved products, the Forest Service will respond to specific questions related to effectiveness, corrosion, toxicity, and environmental impact, based on the results of the product evaluation.

Ownership of Evaluation Results

The entity submitting the product and paying the costs of the evaluation is the only entity that may benefit directly from the results of the evaluation.

Information developed during the course of the evaluation will not be transferred to other parties except at the direct request of the submitter. In fact, the Forest Service will not acknowledge that a submitted formulation is similar to or the same as a product submitted by another. Testing of each product will proceed independently of products submitted by any other company.

The submitting entity may transfer the rights to the evaluation and listing on the qualified products list at its discretion; however, the Forest Service should be notified of such transfer to assure legitimate access to information on file.

Freedom of Information Act (FOIA)

Information provided to the Forest Service as part of the product submission is subject to the Freedom of Information Act (FOIA), 5 U.S.C., Section 552. Confidential and trade secret information will not be disclosed; however, the results of the testing performed by the Forest Service may be disclosed under some circumstances.

Definition

Water enhancers contain ingredients designed to alter the physical characteristics of water to increase effectiveness, accuracy of the drop, or adhesion to fuels. They also improve the ability of water to cling to vertical and smooth surfaces.

They depend on the water that they contain to suppress the fire.

Evaluation Requirements

Prior to being placed on the qualified products list, all water enhancer products must be evaluated and meet the requirements found in the current Forest Service Specification for Water Enhancers for Wildland Firefighting.

The specification is reviewed and updated periodically. Updates are designated by change to the letter designation ending the specification number or by amendment.

The revision in effect on the date of submission for evaluation will be followed. To ensure that the submitter has the most recent revision of the specification, contact the Program Leader or Project Leader at the addresses shown below.

Communication directly with the Program Leader or Project Leader at WFCS is strongly encouraged prior to beginning the submission process.

The submitter should be sufficiently familiar with the specification to be comfortable that the formulation can meet those requirements. Third-party labs may be useful for performing preliminary testing; however, the only test results that will be considered by the Forest Service to determine that a formulation meets its requirements are those performed in the laboratory at WFCS or in third-party laboratories approved by WFCS on samples provided by WFCS. All reports must be sent directly from the third-party laboratory to WFCS. WFCS will inform the submitter of all findings from third-party laboratories in a progress report.

Communication

Communication regarding the water enhancer evaluation process and any required information is normally done by email. The submitter is welcome to call directly or arrange for personal visits. Primary communication may be by hard-copy mail if requested.

Request for Evaluation

Submissions for evaluation should be made in a letter to the Branch Chief, Fire Equipment and Chemicals. The letter should include general information about the potential product and other specifics that may be of interest.

Copies of the letter should be sent to the Program Leader and Project Leader, Fire Chemicals. These people can be contacted at the addresses shown below.

Tory Henderson
Branch Chief, Fire Equipment
and Chemicals
Fire & Aviation Mgmt
National Interagency Fire Center
USDA Forest Service
3833 S. Development Ave.
Boise, ID 83705
Phone: (208) 387-5348
Fax: (208) 387-5398
thenderson@fs.fed.us

Les Holsapple
Program Leader, Fire
Chemicals
MTDC-Wildland Fire
Chemical Systems
USDA Forest Service
5785 Highway 10 West
Missoula, MT 59808
Phone: (406) 829-6761
Fax: (406) 329-4763
lholsapple@fs.fed.us

Cecilia Johnson,
Project Leader, Fire
Chemicals
MTDC-Wildland Fire
Chemical Systems
USDA Forest Service
5785 Highway 10 West
Missoula, MT 59808
Phone: (406) 329-4819
Fax: (406) 329-4763
cjohnson12@fs.fed.us

Collection Agreement

Upon receipt of the request for submission, a Collection Agreement between the Forest Service, Missoula Technology and Development Center (MDTC), WFCS and the submitter will be prepared. This document describes the roles and responsibilities of the Forest Service, WFCS laboratory personnel, and the submitter.

Follow-up discussions may be required to assure that the Forest Service has all of the necessary information to complete the agreement. Specific information in the agreement includes a list of authorized contacts for the Forest Service and for the submitter as well as an estimate of the cost and time required for the evaluation.

The agreement will be sent to the submitter. A cover letter containing instructions will accompany the agreement. Following these instructions relative to authorizing signatures, tax identification, and return of the signed agreement will allow the process to proceed in a timely manner.

Test Fees

The cost of the evaluation is the responsibility of the submitter and will require a deposit of funds to cover the estimated costs, currently about \$15,000. Some specialized tests are conducted by approved third-party laboratories on samples provided by the Forest Service. Cost for these services, about \$15,000, is paid directly to these facilities.

Following receipt of the signed collection agreement, the Forest Service will issue a Bill for Collection to the submitter. This bill will be for the amount determined during discussions between WFCS and the submitter and shown in the agreement. A cover letter of instructions will be included with the bill and will provide the mailing address for the deposit of funds.

A copy of the Bill for Collection should be returned with a check for the specific amount shown in the collection agreement, and marked with the number shown on the bill for collection.

Submission Documents and Formulation Disclosure

Once the deposit of funds has been made, the Fire Chemicals Project Leader will contact the submitter directly to request the required product formulation and technical documentation.

The primary document required is a Confidential Formulation Disclosure Sheet, containing information on all ingredients contained in the formulation. A blank copy of the disclosure sheet is included in the back of this guide. Full disclosure of the types and amounts of each chemical in the product, the Chemical Abstract Services (CAS) number, quality or grade, manufacturer, and manufacturing process must be made for each ingredient.

Other information includes a Material Safety Data Sheet (MSDS) for the product, an MSDS for each ingredient included on the confidential formulation disclosure sheet, and a technical data sheet. If the product is thickened, technical data sheet #2 must also be submitted. A blank copy of each technical data sheet is also included in the back of this guide.

Copies of patents covering any aspect of the formulation or its application in wildland fire operations should also be included.

Forms for the submission of required information are included in this document. They may be printed and submitted as hard copies or the information may be electronically submitted, the forms in word format can be accessed from the web site or the electronic versions may be requested directly from the Fire Chemicals Program Leader or Project Leader.

Formulation Change

The Forest Service Branch Chief, Fire Equipment and Chemicals must be notified of formulation changes. Any change to the formulation, including but not limited to changes in the type, quantity, quality, processing, supplier, manufacturer, or manufacturing site of individual ingredients is considered a formulation change. Qualification testing may be required for any formulation change.

Document Review

The Fire Chemicals Project Leader will review the documentation package for completeness and consistency. Any questions that may arise will be resolved at that time. A review of environmental regulations as they apply to the formulation and the ingredients of the formulation will be completed at the same time.

If any of the ingredients trigger concern, a basic chemical profile and/or a risk assessment may be required before further action is taken on the formulation evaluation. The Forest Service will make a written notification to the submitter of these concerns and include the acceptable remedies and the associate costs. The submitter has the choice to continue or not at this point, and will be asked to notify the Forest Service in writing of that decision.

If required, this risk assessment will be performed by the Forest Service or an approved third-party selected by the Forest Service, using accepted methodology. All costs associated with the additional work will be the responsibility of the submitter.

Product Shipment and Receipt

When the review is complete, WFCS will notify the submitter to ship the product for evaluation.

Wet concentrates must be packaged in 5-gallon plastic buckets with removable lids. Each filled bucket must contain 5 gallons of concentrate. A total of 50 gallons of concentrate is required unless the submitter is informed otherwise by the Project Leader.

Dry concentrates must be packaged in 5-gallon plastic buckets with removable lids. Each filled bucket must weigh no more than 50 pounds. A total of 10 buckets of product is required unless the submitter is informed otherwise by the Project Leader.

When the product is ready to ship, the submitter should notify the Fire Chemicals Project Leader by email or letter.

Ship the product to: Project Leader, WFCS
 USDA Forest Service, MTDC
 5785 Highway 10 West
 Missoula, MT 59808

The Project Leader will notify the submitter by email that the product has been received. Notification by mail may be requested if preferred.

Evaluation

The evaluation will normally be started within one week of receipt of the formulation. The Project Leader will notify the submitter if there is a delay.

The laboratory evaluation will normally take 18 to 24 months to complete following the receipt of the formulation.

The submitter will be provided with progress reports as specific tests are completed. Reports will be sent via email unless the submitter specifically requests a hard copy.

Final Report

When all of the required testing is completed, WFCS will send the submitter a final report summarizing the results of all of the individual tests performed. Recommendations will be made to the Director of Fire and Aviation Management regarding the specific classifications and application methods for which the formulation should be approved.

Acceptance and Notification

The Director of Fire and Aviation Management will notify the submitter in writing of successful completion of the formulation evaluation.

QPL Listing

Following formal acceptance of the evaluation, the formulation will be added to the list of qualified products with the approved classifications and application methods.

Procurement

Water enhancers are generally procured through regional or local contracts.

Submission Forms

Table 1. Confidential Formulation Disclosure Sheet

Table 2. Technical Data Sheet

Table 3. Technical Data Sheet #2 –Thickened Products

Table 2

**Water Enhancer
Technical Data Sheet**

U.S. Department of Agriculture, Forest Service

Product Name: _____

Submitting Co.: _____

Formulation Number: _____

Mix Ratio Range (Fill in one blank.): _____ lb dry concentrate/gal H₂O
_____ gal wet concentrate/gal H₂O

Physical Properties of the wet concentrate and mixed product

	<u>Wet Concentrate</u>	<u>Mixed Product Range</u> (Upper and Lower End of Range)
Density: 70 °F	_____ g/cm ³	_____ g/cm ³
50 °F	_____ g/cm ³	_____ g/cm ³
90 °F	_____ g/cm ³	_____ g/cm ³
Viscosity at 70 °F	_____ centipoise	_____ centipoise
pH at 70 °F	_____	_____
Salting Out Temperature	_____ °F	_____ °F
Freezing Temperature	_____ °F	_____ °F

Describe the recommended method for the laboratory preparation of the product, including any necessary equipment, techniques or precautions during blending, mixing, or handling the concentrate or mixed product. (Attach a separate sheet or laboratory bulletin if needed.)

Describe field mixing, handling, packaging and proposed hardware. (Attach a separate sheet or equipment bulletin if available.)

Table 3

**Water Enhancer
Technical Data Sheet – Page 2**

U.S. Department of Agriculture, Forest Service

Product Name: _____

Submitting Co.: _____

Formulation Number: _____

Mix Ratio Range (Fill in one blank.): _____ **lb dry concentrate/gal H₂O**
_____ **gal wet concentrate/gal H₂O**

Provide the data, graphs, or tables listed below for the mix ratio range for which evaluation has been requested.

- 1. A graph of water enhancer mixture viscosity versus time since mixing, at a temperature test of 70 °F (21 °C). At a minimum, include viscosity at 10 minutes, 60 minutes, 4 hours, 8 hours, 24 hours, and 48 hours after mixing.**
- 2. A table of enhanced water mixture viscosity versus temperature of water used for mixing. Viscosity shall be measured at 10 minutes, 1 hour, and 24 hours following mixing. Temperatures of the tap water used for mixing shall be 40 °F (4 °C), 70 °F (21 °C), and 100 °F (38 °C).**
- 3. A table of enhanced water mixture viscosity at 70 °F (21 °C), 1 hour and 24 hours following mixing, versus the mix ratio from 0.25 percent below the lowest concentration to 0.25 percent above the highest concentration.**
- 4. A table of the effect of temperature on viscosity. Using a enhanced water mixture prepared with 70 °F (21 °C) water and allowed to sit for 24 hours, measure the viscosity of the water enhancer mixture at temperatures of 40 °F (4 °C), 70 °F (21 °C), and 100 °F (38 °C).**
- 5. A table of hardness versus viscosity of the enhanced water mixture at 70 °F (21 °C) for 1 hour and 24 hours after mixing.**
- 6. A table of mix time and speed versus viscosity 1 hour and 24 hours after mixing.**