

2009 Fall Revision Cycle

Report on Proposals

A compilation of NFPA® Technical Committee Reports on Proposals for public review and comment

Public Comment Deadline: March 6, 2009

NOTE: The proposed NFPA documents addressed in this Report on Proposals (ROP) and in a follow-up Report on Comments (ROC) will only be presented for action at the NFPA June 2010 Association Technical Meeting to be held June 7–11, 2010, at Mandalay Bay Convention Center in Las Vegas, NV, when proper Amending Motions have been submitted to the NFPA by the deadline of October 23, 2009. Documents that receive no motions will not be presented at the meeting and instead will be forwarded directly to the Standards Council for action on issuance. For more information on the rules and for up-to-date information on schedules and deadlines for processing NFPA documents, check the NFPA website (www.nfpa.org) or contact NFPA Standards Administration.



National Fire Protection Association®

1 BATTERYMARCH PARK, QUINCY, MA 02169-7471

Information on NFPA Codes and Standards Development

I. Applicable Regulations. The primary rules governing the processing of NFPA documents (codes, standards, recommended practices, and guides) are the *NFPA Regulations Governing Committee Projects (RGCPs)*. Other applicable rules include *NFPA Bylaws*, *NFPA Technical Meeting Convention Rules*, *NFPA Guide for the Conduct of Participants in the NFPA Standards Development Process*, and the *NFPA Regulations Governing Petitions to the Board of Directors from Decisions of the Standards Council*. These rules and regulations are contained in the *NFPA Directory*. For copies of the *Directory*, contact Codes and Standards Administration at NFPA Headquarters; these documents are also available on the NFPA website at “www.nfpa.org.”

The following is general information on the NFPA process. All participants, however, should refer to the actual rules and regulations for a full understanding of this process and for the criteria that govern participation.

II. Technical Committee Report (TCR). The Technical Committee Report is defined as “the Report of the Technical Committee and Technical Correlating Committee (if any) on a document. A Technical Committee Report consists of the Report on Proposals (ROP), as modified by the Report on Comments (ROC), published by the Association” (see 1.4 of *RGCPs*).

III. Step 1: Report on Proposals (ROP). The ROP is defined as “a report to the Association on the actions taken by Technical Committees and/or Technical Correlating Committees, accompanied by a ballot statement and one or more proposals on text for a new document or to amend an existing document” (see 1.4 of *RGCPs*). Any objection to an action in the ROP must be raised through the filing of an appropriate Comment for consideration in the ROC or the objection will be considered resolved.

IV. Step 2: Report on Comments (ROC). The ROC is defined as “a report to the Association on the actions taken by Technical Committees and/or Technical Correlating Committees accompanied by a ballot statement and one or more comments resulting from public review of the Report on Proposals (ROP)” (see 1.4 of *RGCPs*). The ROP and the ROC together constitute the Technical Committee Report. Any outstanding objection following the ROC must be raised through an appropriate Amending Motion at the Association Technical Meeting or the objection will be considered resolved.

V. Step 3a: Action at Association Technical Meeting. Following the publication of the ROC, there is a period during which those wishing to make proper Amending Motions on the Technical Committee Reports must signal their intention by submitting a Notice of Intent to Make a Motion. Documents that receive notice of proper Amending Motions (Certified Amending Motions) will be presented for action at the annual June Association Technical Meeting. At the meeting, the NFPA membership can consider and act on these Certified Amending Motions as well as Follow-up Amending Motions, that is, motions that become necessary as a result of a previous successful Amending Motion. (See 4.6.2 through 4.6.9 of *RGCPs* for a summary of the available Amending Motions and who may make them.) Any outstanding objection following action at an Association Technical Meeting (and any further Technical Committee consideration following successful Amending Motions, see *RGCPs* at 4.7) must be raised through an appeal to the Standards Council or it will be considered to be resolved.

VI. Step 3b: Documents Forwarded Directly to the Council. Where no Notice of Intent to Make a Motion is received and certified in accordance with the Technical Meeting Convention Rules, the document is forwarded directly to the Standards Council for action on issuance. Objections are deemed to be resolved for these documents.

VII. Step 4a: Council Appeals. Anyone can appeal to the Standards Council concerning procedural or substantive matters related to the development, content, or issuance of any document of the Association or on matters within the purview of the authority of the Council, as established by the *Bylaws* and as determined by the Board of Directors. Such appeals must be in written form and filed with the Secretary of the Standards Council (see 1.6 of *RGCPs*). Time constraints for filing an appeal must be in accordance with 1.6.2 of the *RGCPs*. Objections are deemed to be resolved if not pursued at this level.

VIII. Step 4b: Document Issuance. The Standards Council is the issuer of all documents (see Article 8 of *Bylaws*). The Council acts on the issuance of a document presented for action at an Association Technical Meeting within sixty days from the date of the recommendation from the Association Technical Meeting, unless this period is extended by the Council (see 4.8 of *RGCPs*). For documents forwarded directly to the Standards Council, the Council acts on the issuance of the document at its next scheduled meeting, or at such other meeting as the Council may determine (see 4.5.7 and 4.8 of *RGCPs*).

IX. Petitions to the Board of Directors. The Standards Council has been delegated the responsibility for the administration of the codes and standards development process and the issuance of documents. However, where extraordinary circumstances requiring the intervention of the Board of Directors exist, the Board of Directors may take any action necessary to fulfill its obligations to preserve the integrity of the codes and standards development process and to protect the interests of the Association. The rules for petitioning the Board of Directors can be found in the *Regulations Governing Petitions to the Board of Directors from Decisions of the Standards Council* and in 1.7 of the *RGCPs*.

X. For More Information. The program for the Association Technical Meeting (as well as the NFPA website as information becomes available) should be consulted for the date on which each report scheduled for consideration at the meeting will be presented. For copies of the ROP and ROC as well as more information on NFPA rules and for up-to-date information on schedules and deadlines for processing NFPA documents, check the NFPA website (www.nfpa.org) or contact NFPA Codes & Standards Administration at (617-984-7246).

2009 Fall Revision Cycle ROP Contents

by NFPA Numerical Designation

Note: Documents appear in numerical order.

NFPA No.	Type Action	Title	Page No.
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11	P	Standard for Low-, Medium-, and High-Expansion Foam.....	11-1
13E	P	Recommended Practice for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems.....	13E-1
14	P	Standard for the Installation of Standpipe and Hose Systems.....	14-1
18	P	Standard on Wetting Agents	18-1
37	P	Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines	37-1
45	P	Standard on Fire Protection for Laboratories Using Chemicals.....	45-1
53	P	Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres	53-1
70B	P	Recommended Practice for Electrical Equipment Maintenance	70B-1
91	P	Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids	91-1
120	P	Standard for Fire Prevention and Control in Coal Mines	120-1
122	P	Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities.....	122-1
204	P	Standard for Smoke and Heat Venting	204-1
211	P	Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances	211-1
214	P	Standard on Water-Cooling Towers	214-1
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276	N	Standard Method of Fire Test for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-Deck Roofing Components	276-1
326	P	Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair	326-1
329	P	Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases	329-1
405	P	Standard for the Recurring Proficiency of Airport Fire Fighters	405-1
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409	P	Standard on Aircraft Hangars	409-1
410	P	Standard on Aircraft Maintenance	410-1
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600	R	Standard on Industrial Fire Brigades	600-1
601	R	Standard for Security Services in Fire Loss Prevention	601-1
701	P	Standard Methods of Fire Tests for Flame Propagation of Textiles and Films	701-1
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805	P	Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants.....	805-1
806	N	Performance-Based Standard for Fire Protection for Advanced Nuclear Reactor Electric Generating Plants.....	806-1
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851	P	Recommended Practice for Fire Protection for Hydroelectric Generating Plants	851-1
853	P	Standard for the Installation of Stationary Fuel Cell Power Systems	853-1
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1250	P	Recommended Practice in Emergency Service Organization Risk Management.....	1250-1
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1952	N	Standard on Surface Water Operations Protective Clothing and Equipment.....	1952-1
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**2009 Fall Revision Cycle ROP
Committees Reporting**

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851	Recommended Practice for Fire Protection for Hydroelectric Generating Plants	P	851-1
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Electronic Safety Equipment			
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Special Operations Protective Clothing and Equipment			
1952	Standard on Surface Water Operations Protective Clothing and Equipment	N	1952-1
Wildland Fire Fighting Protective Clothing and Equipment			
1977	Standard on Protective Clothing and Equipment for Wildland Fire Fighting	P	1977-1
Fire Department Ground Ladders			
1931	Standard for Manufacturer’s Design of Fire Department Ground Ladders	P	1931-1
1932	Standard on Use, Maintenance, and Service Testing of In-Service Fire Department Ground Ladders	P	1932-1
Fire Department Rescue Tools			
1936	Standard on Powered Rescue Tools	P	1936-1

Fire Protection for Nuclear Facilities				
804	Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants	P		804-1
805	Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants	P		805-1
806	Performance-Based Standard for Fire Protection for Advanced Nuclear Reactor Electric Generating Plants	N		806-1
Fire Risk Assessment Methods				
551	Guide for the Evaluation of Fire Risk Assessments	P		551-1
Fire Service Occupational Safety and Health				
1581	Standard on Fire Department Infection Control Program	P		1581-1
Fire Service Training				
13E	Recommended Practice for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems	P		13E-1
1407	Standard for Fire Service Rapid Intervention Crews	N		1407-1
1410	Standard on Training for Initial Emergency Scene Operations	P		1410-1
1452	Guide for Training Fire Service Personnel to Conduct Dwelling Fire Safety Surveys	P		1452-1
Fire Tests				
255	Standard Method of Test of Surface Burning Characteristics of Building Materials	W		255-1
276	Standard Method of Fire Test for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-Deck Roofing Components	N		276-1
701	Standard Methods of Fire Tests for Flame Propagation of Textiles and Films	P		701-1
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11	Standard for Low-, Medium-, and High-Expansion Foam	P		11-1
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1150	Standard on Foam Chemicals for Fires in Class A Fuels	P		1150-1
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91	Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids	P		91-1
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601	Standard for Security Services in Fire Loss Prevention	R		601-1
Mining Facilities				
120	Standard for Fire Prevention and Control in Coal Mines	P		120-1
122	Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities	P		122-1
Oxygen-Enriched Atmospheres				
53	Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres	P		53-1
Portable Fire Extinguishers				
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1035	Standard for Professional Qualifications for Public Fire and Life Safety Educator	P	1035-1
Smoke Management Systems			
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14	Standard for the Installation of Standpipe and Hose Systems	P	14-1
Subterranean Spaces			
520	Standard on Subterranean Spaces	P	520-1
Tank Leakage and Repair Safeguards			
326	Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair	P	326-1
329	Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases	P	329-1
Water Additives for Fire Control and Vapor Mitigation			
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Water-Cooling Towers			
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750	Standard on Water Mist Fire Protection Systems	P	750-1

Key to Proposal Headings

The first line of every proposal includes the following information:

Document No.	Proposal No.	Log No.	Paragraph Reference	Committee Action
101	6	38	3.4	Accept

Example: 101-6 Log #38
(3.4)

Final Action: Accept

TYPES OF ACTION

P Partial Revision **C** Complete Revision **N** New Document **R** Reconfirmation **W** Withdrawal

The following classifications apply to Committee members and represent their principal interest in the activity of the Committee.

1. **M** Manufacturer: A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard.
2. **U** User: A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.
3. **IM** Installer/Maintainer: A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard.
4. **L** Labor: A labor representative or employee concerned with safety in the workplace.
5. **RT** Applied Research/Testing Laboratory: A representative of an independent testing laboratory or independent applied research organization that promulgates and/or enforces standards.
6. **E** Enforcing Authority: A representative of an agency or an organization that promulgates and/or enforces standards.
7. **I** Insurance: A representative of an insurance company, broker, agent, bureau, or inspection agency.
8. **C** Consumer: A person who is or represents the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in (2).
9. **SE** Special Expert: A person not representing (1) through (8) and who has special expertise in the scope of the standard or portion thereof.

NOTE 1: "Standard" connotes code, standard, recommended practice, or guide.

NOTE 2: A representative includes an employee.

NOTE 3: While these classifications will be used by the Standards Council to achieve a balance for Technical Committees, the Standards Council may determine that new classifications of member or unique interests need representation in order to foster the best possible Committee deliberations on any project. In this connection, the Standards Council may make such appointments as it deems appropriate in the public interest, such as the classification of "Utilities" in the National Electrical Code Committee.

NOTE 4: Representatives of subsidiaries of any group are generally considered to have the same classification as the parent organization.

**FORM FOR COMMENTS ON NFPA REPORT ON PROPOSALS
2009 FALL REVISION CYCLE
FINAL DATE FOR RECEIPT OF COMMENTS: 5:00 pm EST, March 6, 2009**

For further information on the standards-making process, please contact the Codes and Standards Administration at 617-984-7249 or visit www.nfpa.org/codes.

For technical assistance, please call NFPA at 1-800-344-3555.

FOR OFFICE USE ONLY

Log #: _____

Date Rec'd: _____

Please indicate in which format you wish to receive your ROP/ROC electronic paper download
(Note: If choosing the download option, you must view the ROP/ROC from our website; no copy will be sent to you.)

Date 8/1/200X Name John B. Smith Tel. No. 253-555-1234

Company _____ Email _____

Street Address 9 Seattle St. City Tacoma State WA Zip 98402

***If you wish to receive a hard copy, a street address MUST be provided. Deliveries cannot be made to PO boxes.

Please indicate organization represented (if any) Fire Marshals Assn. of North America

1. (a) NFPA Document Title National Fire Alarm Code NFPA No. & Year NFPA 72, 200X ed.

(b) Section/Paragraph 4.4.1.1

2. Comment on Proposal No. (from ROP): 72-7

3. Comment Recommends (check one): new text revised text deleted text

4. Comment (include proposed new or revised wording, or identification of wording to be deleted): [Note: Proposed text should be in legislative format; i.e., use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~).]

Delete exception.

5. **Statement of Problem and Substantiation for Comment:** (Note: State the problem that would be resolved by your recommendation; give the specific reason for your Comment, including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication.)

A properly installed and maintained system should be free of ground faults. The occurrence of one or more ground faults should be required to cause a 'trouble' signal because it indicates a condition that could contribute to future malfunction of the system. Ground fault protection has been widely available on these systems for years and its cost is negligible. Requiring it on all systems will promote better installations, maintenance and reliability.

6. Copyright Assignment

(a) I am the author of the text or other material (such as illustrations, graphs) proposed in this Comment.

(b) Some or all of the text or other material proposed in this Comment was not authored by me. Its source is as follows (please identify which material and provide complete information on its source):

I agree that any material that I author, either individually or with others, in connection with work performed by an NFPA Technical Committee shall be considered to be works made for hire for the NFPA. To the extent that I retain any rights in copyright as to such material, or as to any other material authored by me that I submit for the use of an NFPA Technical Committee in the drafting of an NFPA code, standard, or other NFPA document, I hereby grant and assign all and full rights in copyright to the NFPA. I further agree and acknowledge that I acquire no rights in any publication of the NFPA and that copyright and all rights in materials produced by NFPA Technical Committees are owned by the NFPA and that the NFPA may register copyright in its own name.

Signature (Required) _____

PLEASE USE SEPARATE FORM FOR EACH COMMENT • email: proposals_comments@nfpa.org • NFPA Fax: (617) 770-3500
Mail to: Secretary, Standards Council, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471

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For technical assistance, please call NFPA at 1-800-344-3555.

FOR OFFICE USE ONLY

Log #: _____

Date Rec'd: _____

Please indicate in which format you wish to receive your ROP/ROC electronic paper download
(Note: If choosing the download option, you must view the ROP/ROC from our website; no copy will be sent to you.)

Date _____ Name _____ Tel. No. _____

Company _____ Email _____

Street Address _____ City _____ State _____ Zip _____

***If you wish to receive a hard copy, a street address **MUST** be provided. Deliveries cannot be made to PO boxes.

Please indicate organization represented (if any) _____

1. (a) NFPA Document Title _____ NFPA No. & Year _____

(b) Section/Paragraph _____

2. Comment on Proposal No. (from ROP): _____

3. Comment Recommends (check one): new text revised text deleted text

4. Comment (include proposed new or revised wording, or identification of wording to be deleted): [Note: Proposed text should be in legislative format; i.e., use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~).]

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I agree that any material that I author, either individually or with others, in connection with work performed by an NFPA Technical Committee shall be considered to be works made for hire for the NFPA. To the extent that I retain any rights in copyright as to such material, or as to any other material authored by me that I submit for the use of an NFPA Technical Committee in the drafting of an NFPA code, standard, or other NFPA document, I hereby grant and assign all and full rights in copyright to the NFPA. I further agree and acknowledge that I acquire no rights in any publication of the NFPA and that copyright and all rights in materials produced by NFPA Technical Committees are owned by the NFPA and that the NFPA may register copyright in its own name.

Signature (Required) _____

**PLEASE USE SEPARATE FORM FOR EACH COMMENT • email: proposals_comments@nfpa.org • NFPA Fax: (617) 770-3500
Mail to: Secretary, Standards Council, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471**

10/31/2008

Sequence of Events Leading to Issuance of an NFPA Committee Document

Step 1 Call for Proposals

▼ Proposed new document or new edition of an existing document is entered into one of two yearly revision cycles, and a Call for Proposals is published.

Step 2 Report on Proposals (ROP)

▼ Committee meets to act on Proposals, to develop its own Proposals, and to prepare its Report.

▼ Committee votes by written ballot on Proposals. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.

▼ Report on Proposals (ROP) is published for public review and comment.

Step 3 Report on Comments (ROC)

▼ Committee meets to act on Public Comments to develop its own Comments, and to prepare its report.

▼ Committee votes by written ballot on Comments. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.

▼ Report on Comments (ROC) is published for public review.

Step 4 Technical Committee Report Session

▼ "*Notices of intent to make a motion*" are filed, are reviewed, and valid motions are certified for presentation at the Technical Committee Report Session. ("Consent Documents" that have no certified motions bypass the Technical Committee Report Session and proceed to the Standards Council for issuance.)

▼ NFPA membership meets each June at the Annual Meeting Technical Committee Report Session and acts on Technical Committee Reports (ROP and ROC) for documents with "certified amending motions."

▼ Committee(s) vote on any amendments to Report approved at NFPA Annual Membership Meeting.

Step 5 Standards Council Issuance

▼ Notification of intent to file an appeal to the Standards Council on Association action must be filed within 20 days of the NFPA Annual Membership Meeting.

▼ Standards Council decides, based on all evidence, whether or not to issue document or to take other action, including hearing any appeals.

The Technical Committee Report Session of the NFPA Annual Meeting

The process of public input and review does not end with the publication of the ROP and ROC. Following the completion of the Proposal and Comment periods, there is yet a further opportunity for debate and discussion through the Technical Committee Report Sessions that take place at the NFPA Annual Meeting.

The Technical Committee Report Session provides an opportunity for the final Technical Committee Report (i.e., the ROP and ROC) on each proposed new or revised code or standard to be presented to the NFPA membership for the debate and consideration of motions to amend the Report. The specific rules for the types of motions that can be made and who can make them are set forth in NFPA's rules, which should always be consulted by those wishing to bring an issue before the membership at a Technical Committee Report Session. The following presents some of the main features of how a Report is handled.

What Amending Motions Are Allowed. The Technical Committee Reports contain many Proposals and Comments that the Technical Committee has rejected or revised in whole or in part. Actions of the Technical Committee published in the ROP may also eventually be rejected or revised by the Technical Committee during the development of its ROC. The motions allowed by NFPA rules provide the opportunity to propose amendments to the text of a proposed code or standard based on these published Proposals, Comments, and Committee actions. Thus, the list of allowable motions include motions to accept Proposals and Comments in whole or in part as submitted or as modified by a Technical Committee action. Motions are also available to reject an accepted Comment in whole or part. In addition, Motions can be made to return an entire Technical Committee Report or a portion of the Report to the Technical Committee for further study.

The NFPA Annual Meeting, also known as the NFPA World Safety Conference & Exposition®, takes place in June of each year. A second Fall membership meeting was discontinued in 2004, so the NFPA Technical Committee Report Session now runs once each year at the Annual Meeting in June.

Who Can Make Amending Motions. NFPA rules also define those authorized to make amending motions. In many cases, the maker of the motion is limited by NFPA rules to the original submitter of the Proposal or Comment or his or her duly authorized representative. In other cases, such as a Motion to Reject an accepted Comment, or to Return a Technical Committee Report or a portion of a Technical Committee Report for Further Study, anyone can make these motions. For a complete explanation, NFPA rules should be consulted.

The Filing of a Notice of Intent to Make a Motion. Before making an allowable motion at a Technical Report Session, the intended maker of the motion must file, in advance of the session, and within the published deadline, a Notice of Intent to Make a Motion. A Motions Committee appointed by the Standards Council then reviews all notices and certifies all amending motions that are proper. The Motions Committee can also, in consultation with the makers of the motions, clarify the intent of the motions and, in certain circumstances, combine motions that are dependent on each other together so that they can be made in one single motion. A Motions Committee report is then made available in advance of the meeting listing all certified motions. Only these Certified Amending Motions, together with certain allowable Follow-Up Motions (that is, motions that have become necessary as a result of previous successful amending motions) will be allowed at the Technical Committee Report Session.

Consent Documents. Often there are codes and standards up for consideration by the membership that will be noncontroversial and no proper Notices of Intent to Make a Motion will be filed. These "Consent Documents" will bypass the Technical Committee Report Session and head straight to the Standards Council for issuance. The remaining Documents are then forwarded to the Technical Committee Report Session for consideration of the NFPA membership.

Action on Motions at the Technical Committee Report Session. In order to actually make a Certified Amending Motion at the Technical Committee Report Session, the maker of the motion must sign in at least an hour before the session begins. In this way a final list of motions can be set in advance of the session. At the session, each proposed document up for consideration is presented by a motion to adopt the Technical Committee Report on the document. Following each such motion, the presiding officer in charge of the session opens the floor to motions on the document from the final list of Certified Amending Motions followed by any permissible Follow-Up Motions. Debate and voting on each motion proceeds in accordance with NFPA rules. NFPA membership is not required in order to make or speak to a motion, but voting is limited to NFPA members who have joined at least 180 days prior to the session and have registered for the meeting. At the close of debate on each motion, voting takes place, and the motion requires a majority vote to carry. In order to amend a Technical Committee Report, successful amending motions must be confirmed by the responsible Technical Committee, which conducts a written ballot on all successful amending motions following the meeting and prior to the Document being forwarded to the Standards Council for issuance.

Standards Council Issuance

One of the primary responsibilities of the NFPA Standards Council, as the overseer of the NFPA codes and standards development process, is to act as the official issuer of all NFPA codes and standards. When it convenes to issue NFPA documents, it also hears any appeals related to the document. Appeals are an important part of assuring that all NFPA rules have been followed and that due process and fairness have been upheld throughout the codes and standards development process. The Council considers appeals both in writing and through the conduct of hearings at which all interested parties can participate. It decides appeals based on the entire record of the process as well as all submissions on the appeal. After deciding all appeals related to a document before it, the Council, if appropriate, proceeds to issue the document as an official NFPA code or standard. Subject only to limited review by the NFPA Board of Directors, the decision of the Standards Council is final, and the new NFPA code or standard becomes effective twenty days after Standards Council issuance.

Report of the Committee on
Water Additives for Fire Control and Vapor Mitigation

Armand V. Brandao, *Chair*
 FM Approvals, MA [I]

Michael T. Greiner, *Secretary*
 Hazard Control Technologies, Inc., GA [M]

Paul E. Caron, Paul E. Caron Associates, MA [SE]
Dominic J. Colletti, Hale Products, Inc., PA [M]
 Rep. Fire Apparatus Manufacturers Association
James M. Figueira, Environmental Chemical Solutions, CA [M]
Charles W. George, IFSC Consultants, MT [SE]
Christopher P. Hanauska, Hughes Associates, Inc., MN [SE]
Mitchell Hubert, Tyco International/Ansul Inc., WI [M]
 Rep. Fire Suppression Systems Association
Cecilia W. Johnson, USDA Forest Service, MT [RT]
Blake M. Shugarman, Underwriters Laboratories Inc., IL [RT]
Robert E. Tinsley, Jr., Pyrocool Technologies, Inc., VA [M]
Howard L. Vandersall, Lawdon Fire Services, Inc., CA [SE]
 Rep. TC on Forest and Fural Fire Protection
Joseph A. Wright, ARFF Technical Services, Inc., PA [SE]

Alternates

Robert R. Carter, Hazard Control Technologies Canada, Canada [M]
 (Alt. to Michael T. Greiner)
George Unger, Underwriters' Laboratories of Canada, Canada [RT]
 (Alt. to Blake M. Shugarman)
Bennie Vincent, FM Global, MA [I]
 (Alt. to Armand V. Brandao)

Staff Liaison: **Timothy A. Hawthorne**

Committee Scope: This Committee shall have primary responsibility for documents on the manufacture, testing, application, and use of water additives for the control and/or suppression of fire and flammable vapor mitigation including water additives used to prevent or reduce the spread of fire and the use of water additives in fixed, semi-fixed, mobile, and portable fire suppression systems.

This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the front of this book.

The Report of the Technical Committee on **Water Additives for Fire Control and Vapor Mitigation** is presented for adoption.

This Report was prepared by the **Technical Committee on Water Additives for Fire Control and Vapor Mitigation** and proposes for adoption, amendments to NFPA 18, **Standard on Wetting Agents**, 2006 edition. NFPA 18-2006 is published in Volume 2 of the 2008 National Fire Codes and in separate pamphlet form.

This Report has been submitted to letter ballot of the **Technical Committee on Water Additives for Fire Control and Vapor Mitigation**, which consists of 13 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

18-1 Log #CP1
(Entire Document)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Review entire document to: 1) Update any extracted material by preparing separate proposals to do so, and 2) review and update references to other organizations documents, by preparing proposal(s) as required.
Substantiation: To conform to the NFPA Regulations Governing Committee Projects.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-2 Log #CP12
(1.5 Equivalency)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise text as follows:

1.5 Equivalency.
Nothing in this standard is intended to prevent the use of new methods or devices, provided sufficient technical data are submitted to the authority having jurisdiction to demonstrate that the new method or devices are equivalent in quality, effectiveness, durability, and safety to those prescribed by this standard.

Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency. The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-3 Log #CP11
(1.6.2)

Final Action: Reject

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise text as follows:

1.6.2 The conversion procedure used for the U.S. units is to multiply the primary SI quantity by the conversion factor and then round the result (if necessary) to the appropriate number of significant digits decimal places.

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.

Committee Meeting Action: Reject

Committee Statement: Committee feels the current language is appropriate for this document. Significant digits is a specific term well understood in the scientific community.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-4 Log #CP22
(2.2)

Final Action: Reject

Note: This proposal is reported as a "Reject" as it did not receive the simple majority affirmative vote.

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Delete references to specific threshold values for with regard to toxicity and biodegradability testing, and simply refer to the guidelines of US EPA, or equivalent, as follows:

Chapter 2 Referenced Publications
2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 13, Standard for the Installation of Sprinkler Systems, 2007 edition.

NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 2007 edition.

NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection, 2007 edition.

NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2008 edition.

NFPA 1901, Standard for Automotive Fire Apparatus, 2003 edition.

Substantiation: Updates editions of referenced NFPA documents.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 6 Negative: 3

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

GEORGE, C.: EPA does not conduct toxicity testing and statement

NFPA Tech committees limited in regard to what can be stated in standard is that they must meet "guidelines" is inconsistent and inappropriate in relation to response to environmental safety and health (see NFPA 18 and 1150).

JOHNSON, C.: Many standards and testing bodies provide documented test methods for performing certain tests. This helps assure that testing labs are using the same methodology and allows interested parties from users to regulatory bodies to compare performance information from a number of sources.

If a test method includes performance requirements; i.e. pass or fail bounds then those should be followed unless an explanation is provided for the deviation from the standard. However, most test methods do not contain performance limits, and in this case, others need to include implementing language that includes the performance limits.

NFPA Technical Committees have the responsibility to prepare useful documents for their members and others who look to NFPA for guidance. Many of the AHJ do not have the appropriate technical expertise in-house to determine reasonable and appropriate limits for required tests. We as a committee need to be accountable to those looking to the TC for assistance on selecting products.

If this proposal is accepted, we would remove all performance limits from toxicity testing. This amounts to a failure to perform our assignment and abdicate our responsibility to users who depend on the committee for advice with regards to safe and effective products.

Going a step further, we would have to remove the limits from most sections citing ASTM or NACE test methods as that is exactly what these documents are, standard methods to perform a test.

VANDERSALL, H.: The Committee was told by the Liaison that NFPA Technical Committees "can only state that the toxicology of the water additive and/or the wetting agent must meet US EPA Guidelines, or equivalent. This Technical Committee is not considered the technical expert when it comes to deciding what is an acceptable or unacceptable level of toxicity. The US EPA is the toxicity expert". This statement was accepted by a majority of those Committee members attending the ROP meeting. I was not one of them.

I believe this to be an incorrect interpretation of NFPA policy/practice. For example, both NFPA 18A, Standard on Water Additives for Fire Control and Vapor Mitigation, 2007 edition and NFPA 1150, Standard on Foam Chemicals for Fires in Class A Fuels, 2004 edition contain essentially the same requirements as those present in the 2006 edition of NFPA-18.

Further, it is my understanding that NEPA does not conduct toxicity testing nor establish the safety of mixtures of components. Wetting agents are mixtures of component chemicals. The toxicity of the components in a composition does not equate to the toxicity (safety) of mixtures of these components. For example, ammonium nitrate is a very safe fertilizer and many thousands of tons without concern for its toxicity; lubricating oils are used in vast quantities as well and can be purchased in any hardware or auto parts store. However, combining the two of these relatively safe components and placing them in a contained environment results in one of the most hazardous explosive known. It would be dishonest, at best, if this mixture were provided to a user and a warning was not included.

Lastly, the Technical Committee, responsible for development and maintenance of a Standard designed to provide guidance to the user and/or the AHJ, needs to have and provide information on the acceptability (including safety) of the "product whether it be hardware or a chemical composition. Otherwise, the developed Standard does not serve its purpose. The Technical Committee is the recognized authority to which NFPA and the AHJ depend to provide the required information for the Standards. Restricting any aspect of their authority in developing the Standard defeats the purpose for which it is being developed.

I urge the Committee to defend their ability to provide in a Standard whatever information is deemed necessary to provide the AHJ with the information that should be available.

18-5 Log #CP23
(2.3)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise text to read as follows:

2.3 Other Publications.

2.3.1 ASTM Publications. American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 97, Standard Test Method for Pour Point of Petroleum Products, 2007.

ASTM D 1331, Standard Test Methods for Surface and Interfacial Tension of Solutions of Surface-Active Agents, 1989, Reapproved 2001.

ASTM F 1267, Standard Specification for Metal, Expanded, Steel, 2007.

ASTM G 1, Standard Practice for Preparing, Cleaning, and Evaluating

Corrosion Test Specimens, 2003.

ASTM G 31, Standard Practice for Laboratory Immersion Corrosion Testing of Metals, 1972, Reapproved 2004.

2.3.2 NACE Publication. NACE International, 1440 South Creek Drive, Houston, TX 77084-4906.

TM0169, Standard Test Method for Laboratory Corrosion Testing of Metals, Reaffirmed 2000.

2.3.3 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 162, Standard for Foam Equipment and Liquid Concentrates, 1994, revised 1999.

UL 711/ULC S508, Rating and Testing of Fire Extinguishers, 2004, revised 2007.

2.3.4 Other Publication. Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

Substantiation: Updates referenced publications

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-6 Log #1
(2.3.4)

Final Action: Accept in Principle

Submitter: Bob Eugene, Underwriters Laboratories Inc.

Recommendation: Revise text as follows:

2.3.4 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 162, Standard for Foam Equipment and Liquid Concentrates, 1994, Revised 1999.

UL 711, Rating and Testing of Fire Extinguishers, 2002-2007.

Substantiation: Updated referenced standards to include the most recent revisions.

Committee Meeting Action: Accept in Principle

Committee Statement: See Committee Action on Proposal 18-7 (Log #3).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-7 Log #3
(2.3.4 and B.1.2.1)

Final Action: Accept

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

2.3.4 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 162, *Standard for Foam Equipment and Liquid Concentrates*, 1994, revised 1999.

UL 711/ULC S508, Rating and Testing of Fire Extinguishers, 2002-2004, revised 2007.

B.1.2.1 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 300, *Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment, 2005 Restaurant-Cooking Areas*, 1996.

UL 711/ULC S508, Rating and Testing of Fire Extinguishers, 2004, revised 2007.

Substantiation: None given.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-8 Log #CP29
(2.3.6)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Add references to US EPA documents as shown:

2.3.x U.S. EPA Publications.

Environmental Protection Agency, National Service Center for Environmental Publications (NSCEP), P.O. Box 42419, Cincinnati, OH 45242.

OPPTS 835.3110, Ready Biodegradability, Section M, CO2 Evolution (Modified Sturm) Test, Fate, Transport and Transformation Test Guidelines, January 1998.

OPPTS 850.1075, Fish Acute Toxicity Test, Freshwater and Marine, Ecological Effects Test Guidelines, 1996.

OPPTS 870.1100, Acute Oral Toxicity, Health Effects Test Guidelines, 2002.

OPPTS 870.1200, Acute Dermal Toxicity, Health Effects Test Guidelines, 1998.

OPPTS 870.2400, Acute Eye Irritation, Health Effects Test Guidelines, 1998.

OPPTS 870.2500, Acute Dermal Irritation, Health Effects Test Guidelines, 1998.

Substantiation: Updates reference titles and editions as used in the standard.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-9 Log #CP24
(2.4)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise text to read as follows:

2.4 References for Extracts in Mandatory Sections.

NFPA 10, Standard for Portable Fire Extinguishers, 2007 edition.

NFPA 306, Standard for the Control of Gas Hazards on Vessels, 2003 edition.

Substantiation: Updates references to mandatory text standards.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-10 Log #CP25
(Chapter 3)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Staff Liaison to make updates to all referenced definitions in NFPA 18 to the current editions. Also check that the definitions have not changed.

3.3 General Definitions.

3.3.1 Class A Fires. Class A fires are fires in ordinary combustible materials, such as wood, cloth, paper, rubber, and many plastics. [10: 2007]

3.3.2 Class B Fires. Class B fires are fires in flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols, and flammable gases. [10: 2007]

3.3.3 Class C Fires. Class C Fires. Class C fires are fires that involve energized electrical equipment. [10: 2007]

3.3.4 Class D Fires. Class D fires are fires in combustible metals, such as magnesium, titanium, zirconium, sodium, lithium, and potassium. [10:2007]

3.3.5 Combustible Liquid. Any liquid that has a closed-cup flash point at or above 37.8°C (100°F). [306, 2003]

3.3.6 Flammable Liquid. Any liquid that has a closed-cup flash point below 100°F (37.8°C), as determined by the test procedures and apparatus set forth in Section 4.4, and a Reid vapor pressure that does not exceed an absolute pressure of 40 psi (276 kPa) at 100°F (37.8°C), as determined by ASTM D 323, Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method). Flammable liquids are classified according to Section 4.3. [30: 2008]

3.3.7 Wetting Agent. A concentrate which, when added to water reduces the surface tension and increases its ability to penetrate and spread.

3.3.8 Wetting Agent Solution. Water to which a wetting agent has been added.

Substantiation: Updates references from other NFPA documents.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-11 Log #CP13
(3.3.7)

Final Action: Reject

Note: This proposal is reported as a "Reject" as it did not receive the simple majority affirmative vote.

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Add to the following section:

3.3.7 Wetting Agent Concentrate. A concentrate which, when added to water reduces the surface tension and increases its ability to penetrate and spread.

Substantiation: Adding the word concentrate will provide consistency and help the user understand fully what is being discussed.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 6 Negative: 3

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

GEORGE, C.: Unnecessary addition of a word that results in confusion.

Apply "Clear Text" throughout. This is an issue in 18-12 (Log #4), 18-14 (Log #6), 18-22 (Log #8), 18-23 (Log #CP16), 18-28 (Log #12), 18-29 (Log #13), & 18-49 (Log #32)

JOHNSON, C.: NFPA 18 defines wetting agent as "A concentrate which, when added to water reduces the surface tension and increases its ability to penetrate and spread."

Provided that users of the standard read the definitions this should be adequate although adding the sentence "within the body of this document the term concentrate is used to mean wetting agent." Similarly, a statement added to the definition of wetting agent solution "within the body of this document the term solution is used to mean wetting agent solution."

If accepted most of the paragraphs of this section will need to be amended to maintain consistency. This seems to me to be a lot of effort for one word which may not improve understanding of the intent or the requirement.

The committee needs to have a discussion on the use of "wetting agent."

“wetting agent concentrate,” “concentrate,” “wetting agent solution,” and “solution” at the beginning of the next meeting. Once there is accord on the use of each term the entire standard should be reviewed specifically to align the terminology with the committee’s decision.

VANDERSALL, H.: The definition in NFPA-18 is as follows: “Wetting Agent. A concentrate which, when added to water reduces the surface tension and increases its ability to penetrate and spread.” This proposal changes Wetting Agent to Wetting Agent Concentrate in the title.

This seems like a small change, unworthy of comment, but it results in the unnecessary addition of the word “concentrate” in many-many locations throughout the text. That would, of course, be justified if the change did, in fact, improve clarity. However, I believe that it just adds words that may, in fact, increase the fogging of the message. Adding words for the sake of change should be avoided. This comment relates to all of the Proposals listed above.

18-12 Log #4
(4.1)

Final Action: Accept in Principle

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

4.1 General.

4.1.1 Wetting agent concentrate agents for fire fighting shall be listed and shall be approved by the authority having jurisdiction.

4.1.2 Wetting agent concentrate agents shall only be mixed with water.

Substantiation: The proposed revisions provide clarification of intended use.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

4.1 General.

4.1.1 Wetting agent concentrates for fire fighting shall comply with all of the following:

4.1.1.1 Wetting agent concentrate shall be listed.

4.1.1.2 Wetting agent concentrate shall only be mixed with water.

4.1.1.3 Wetting agent concentrate shall be used at the prescribed proportion(s), in accordance with its listing(s).

4.1.1.4 The use of wetting agent concentrate shall be approved by the authority having jurisdiction.

Committee Statement: Rewording of proposal meets submitter’s intent.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 7 Negative: 2

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: The definitions currently in NFPA 18 define wetting agent as the concentrate and further define wetting agent solutions as “water to which a wetting agent has been added.”

This is pretty clear and there is no reason for us to add more words that cannot clarify a clear statement.

VANDERSALL, H.: See my Explanation of Negative on Proposal 18-11 (Log #CP13).

18-13 Log #5
(4.2 and A.4.2)

Final Action: Accept in Principle in Part

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

4.2 Limitations.

4.2.1 General. The use of a wetting agent solution shall be limited to those applications identified by the manufacturer’s listing and Section 4.2.

4.2.2 Water-Reactive Chemicals. Wetting agent solution shall have the same limitations as water with respect to extinguishing fires involving chemicals that react with water to create additional hazards.

4.2.3 Class B Fires.

4.2.3.1 The use of wetting agent solution for the extinguishment of fires involving Class B flammable or combustible liquids shall be limited to those fuels not soluble in water unless specifically listed for that purpose.

4.2.3.2†* The use of fire Fire extinguishers and fixed fire extinguishing systems using wetting agent solution(s) shall not be permitted for the extinguishment of fires in commercial cooking equipment cooking appliances that involve combustible cooking media (vegetable or animal oils and fats) unless specifically listed for this hazard.

4.2.4* Class C Fires. Wetting agent solution shall have the same limitations as water with respect to extinguishing fires involving energized electrical equipment.

4.2.5 Class D Fires. Wetting agent solution shall not be used on Class D fires unless specifically listed for that purpose.

A.4.2.3.2† Fire test requirements for protection of commercial cooking equipment are addressed by UL 300 for fixed fire extinguishing systems and UL 711/ULC S508 for fire extinguishers.

A.4.2.4 Should wetting agent solution come in contact with electrical equipment, the wetting agent can remain behind after the water has dried off and can constitute a hazard when the equipment is put back in operation.

A.4.2.5 Fire test requirements for protection of Class D hazards are addressed by UL 711/ULC S508.

Substantiation: With exception of 4.2.3.1, the proposed revisions are editorial in nature and provide consistency between NFPA 18 and NFPA 18A. For

4.2.3.1, this standard does not include requirements for fuels soluble in water.

Committee Meeting Action: Accept in Principle in Part

Revise text to read as follows:

4.2 Limitations.

4.2.1 General*. The use of a wetting agent solution shall be limited to those systems and applications identified by the manufacturer’s listing and Section 4.2.

4.2.2 Water-Reactive Chemicals. Wetting agent solution shall have the same limitations as water with respect to extinguishing fires involving chemicals that react with water to create additional hazards.

4.2.3 Class B Fires.

4.2.3.1 The use of wetting agent solution for the extinguishment of fires involving Class B flammable or combustible liquids shall be limited to those fuels not soluble in water.

4.2.3.2†* The use of fixed fire extinguishing systems using wetting agent solution(s) shall not be permitted for the extinguishment of fires in commercial cooking equipment that involve combustible cooking media (vegetable or animal oils and fats) unless specifically listed for this hazard.

4.2.4* Class C Fires. Wetting agent solution shall have the same limitations as water with respect to extinguishing fires involving energized electrical equipment.

4.2.5 Class D Fires. Wetting agent solution shall not be used on Class D fires unless specifically listed for that purpose.

A.4.2.1 It is not the intent of this standard to address portable fire extinguishers, which are addressed in NFPA 10.

A.4.2.3.2† Fire test requirements for protection of commercial cooking equipment are addressed by UL 300 for fixed fire extinguishing systems. The fire protection requirements for Combustible cooking media protection are addressed under NFPA 17 and NFPA 17A.

A.4.2.4 Should wetting agent solution come in contact with electrical equipment, the wetting agent can remain behind after the water has evaporated and can constitute a hazard when the equipment is put back in operation.

A.4.2.5 Fire test requirements for protection of Class D hazards are addressed by UL 711/ULC S508

Committee Statement: Rewording accurately reflects the submitter’s intent with the inclusion for requirements for fuel soluble in water.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-14 Log #6
(4.3 and A.4.3)

Final Action: Accept in Principle

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

4.3* Compatibility of Wetting Agents Concentrate and Solutions.

4.3.1 Wetting agent concentrate of different brands and other types of concentrate intended for fire prevention, control, suppression, extinguishment, or vapor mitigation agents shall not be mixed with other wetting agents or additives.

4.3.2 Premixed solution prepared with wetting agent concentrate of different brands and premixed solution prepared with other types of concentrate intended for fire prevention, control, suppression, extinguishment, or vapor mitigation. Wetting agent solutions shall not be mixed within the same storage container, with other wetting agent solutions or additive solutions.

4.3.3 Wetting agent solutions Solution generated separately with wetting agent concentrate of different brands shall be permitted to be applied to a fire in sequence or simultaneously.

4.3.4 Solution generated with wetting agent concentrate and solution generated with other types of concentrate intended for fire prevention, control, suppression, extinguishment, or vapor mitigation shall be permitted to be applied to a fire in sequence or simultaneously when approved by the authority having jurisdiction.

A.4.3 The mixing of these agents concentrates can have adverse effects and render solutions or systems ineffective for fire prevention, control, suppression, extinguishment, or vapor mitigation.

Substantiation: The proposed revisions provide clarification of intended compatibility use and consideration of compatibility with other types of concentrates intended for fire prevention, control, suppression, extinguishment, or vapor mitigation. The other types of concentrate include Class B foam concentrate [NFPA 11], Class A foam concentrate [NFPA 1150], wetting agent concentrate [NFPA 18], and water additive concentrate [NFPA 18A].

Committee Meeting Action: Accept in Principle

Add definition for Additive as follows:

3.3.X Additive. A liquid such as foam concentrates, emulsifiers, and hazardous vapor suppression liquids and foaming agents intended to be added to the water.

Revise text to read as follows:

4.3* Compatibility of Wetting Agent Concentrate and Solution(s).

4.3.1 Wetting agent concentrate(s) shall not be mixed with different wetting agent concentrate(s) or additive(s) within the same container.

4.3.2 Premixed solution(s) prepared with wetting agent concentrate(s) shall not be mixed with premixed solution(s) prepared with different wetting agent concentrate(s) or additive(s), within the same container.

–4.3.3 Solution generated separately with wetting agent concentrate shall be permitted to be applied to a fire in sequence or simultaneously when approved by the authority having jurisdiction.

4.3.4 Solution generated with wetting agent concentrate and solution generated with other types of concentrate intended for fire prevention, control, suppression, extinguishment, or vapor mitigation shall be permitted to be applied to a fire in sequence or simultaneously when approved by the authority having jurisdiction.

A.4.3 The mixing of these concentrates can have adverse effects and render solutions or systems ineffective for fire prevention, control, suppression, extinguishment, or vapor mitigation.

Committee Statement: Rewording meets the intent of the submitter. Chair appointed a task group to examine the annex material for this section.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 7 Negative: 2

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.
Explanation of Negative:

JOHNSON, C.: I think that the concept of the revisions of this section are good; however, I think we need to stop adding words that are not needed for clarity.

See my Explanation of Negative on 18-11 (Log #CP13) regarding the inclusion of a “short name” for the concentrate and the solution applies here as well.

VANDERSALL, H.: See my Explanation of Negative on Proposal 18-11 (Log #CP13).

18-15 Log #CP28
(4.5)

Final Action: Reject

Note: This proposal is reported as a “Reject” as it did not receive the simple majority affirmative vote.

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Proposal: Add new and delete text as indicated
4.5* Health, Safety, and Environmental Considerations.

4.5.1 The toxicity and biodegradability of wetting agent concentrate(s) and wetting agent solution(s) shall be evaluated in a manner equivalent to the guidelines used by the U.S. Environmental Protection Agency’s (EPA).

The following EPA OPPTS tests or their equivalent:

- (1) Health Effects Test Guidelines, OPPTS 870.1100, Acute Oral Toxicity
- (2) Health Effects Test Guidelines, OPPTS 870.1200, Acute Dermal Toxicity
- (3) Health Effects Test Guidelines, OPPTS 870.2400, Acute Eye Irritation
- (4) Health Effects Test Guidelines, OPPTS 870.2500, Acute Dermal Irritation
- (5) Ecological Effects Test Guidelines, OPPTS 850.1075, Fish Acute Toxicity Test, Freshwater and Marine

(6) Fate, Transport, and Transformation Test Guidelines, OPPTS 835.3110, Ready Biodegradability

4.5.2 The toxicity and biodegradability limits determined in 4.5.1 shall be approved by the authority having jurisdiction

5.2.7 Toxicity:

– 5.2.7.1* Wetting agents shall comply with the following EPA OPPTS tests or their equivalent:

- (1) 870.1100 Acute Oral Toxicity
- (2) 870.1200 Acute Dermal Toxicity
- (3) 870.2400 Acute Eye Irritation
- (4) 870.2500 Acute Dermal Irritation

– 5.2.7.2 The wetting agent and the maximum use solution shall not exceed the toxicity limits established in Table 5.2.7.2 when tested in accordance with 5.2.7.1.

– Table 5.2.7.2 Toxicity Limits for Wetting Agents and Wetting Agent Solutions

(Also delete table content)

A.4.5 The handling, mixing, and application of wetting agent concentrate should follow specific operational procedures to protect the water source and to provide safety in the workplace. Secondary containment devices such as berms should be used to isolate potential spills from the aquatic environment.

The following procedures should be used where wetting agent solutions are mixed and applied:

- (1) Fire apparatus tanks should not leak, and operators should use appropriate methods and equipment to avoid overflow spills and discharge hose spills when filling the tanks.
- (2) Portable tanks or sumps that are used to premix solution or to fill application vehicles should be located at least 30 m (100 ft) from bodies of water. Mixing operations should be conducted in such a manner as to avoid spilling wetting agent concentrate or solution. Spillage should not enter drainage systems that empty into fish habitats or waterways that flow into fish-inhabited water.

A.4.5.1 (A.5.2.7.1) There are other organizations, such as the Organization for Economic Cooperation and Development (OECD), having similar test guidelines that can be substituted with the approval of the authority having jurisdiction.

Substantiation: This removes the toxicity requirements from the Standard and allows the toxicity of materials to be evaluated by the EPA, or equivalent experts.

Committee Meeting Action: Accept

Committee Statement: Separate Ballot to whole committee.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 6 Negative: 3

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

GEORGE, C.: See my Explanation of Negative on 18-4 (Log #CP22).

JOHNSON, C.: See my Explanation of Negative on 18-4 (Log #CP22). The committee is responsible for preparing a useful and meaningful document.

Removing the performance criteria is an abdication of this responsibility.

We need to take advantage of the technical expertise of committee members to include requirements that will assist the AHJ in decision making. Toxicity testing, and the associated performance limits, is one of those areas where it is unlikely that the AHJ will have the knowledge to establish meaningful toxicity limits.

VANDERSALL, H.: See my Comment 1. This proposal removes the responsibility of placing product toxicity limits from the Technical Committee and assigns it to the AHJ. It is unlikely that the user or the AHJ would have the capability or the technical expertise necessary to establish toxicity limits.

18-16 Log #CP15
(Chapter 5)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Change title of Chapter 5 as follows:

Requirements and Test Methods for Wetting Agent Concentrates and Wetting Agent Solutions.

Substantiation: Committee feels this would be consistent with definitions used in this standard and other standards.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 7 Negative: 2

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: The definition is clear that a wetting agent is a concentrate. We don’t need to further muddy those waters. See my Explanation of Negative on 18-11 (Log #CP13).

VANDERSALL, H.: The NFPA-18 Technical Committee, edition 2006 decided to separate the testing requirements for the wetting agent as received from the supplier from those on the user prepared wetting agent solutions. The TC, at that time, decided that separation improved the clarity of the document. This proposal suggests combining the two. Nothing has changed since 2006. It is believed that the original organization is clearer than the proposed organization.

18-17 Log #7
(5.1)

Final Action: Accept in Principle

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

5.1 General.

5.1.1 Wetting agents concentrate and wetting agent solutions prepared at the concentrations specified for use by the manufacturer shall be subjected to the tests in this chapter tested in accordance with Sections 5.2 and 5.3.

5.1.2 The tests detailed in this chapter shall be conducted by an approved independent laboratory using laboratory practices in accordance with ISO/IEC 17025, 40 CFR 160, 40 CFR 792, or equivalent as applicable, and the results shall be recorded and made available by the manufacturer on a technical data sheet.

5.1.3 The information developed in response to the requirements of this chapter shall be reported on the manufacturer’s technical data sheet and made available to potential users.

Substantiation: The proposed revisions maintain consistency between NFPA 18 and NFPA 18A.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

5.1 General.

5.1.1 Wetting agent concentrate(s) and wetting agent solution(s) prepared at the concentration(s) specified for use by the manufacturer shall be subjected to the tests in this chapter.

Committee Statement: Rewording meets the submitter’s intent.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 7 Negative: 2

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: The definition is clear that a wetting agent is a concentrate. We don’t need to further muddy those waters. See my Explanation of Negative on 18-11 (Log #CP13).

The addition of the word “prepared at the concentration(s) specified for use by the manufacturer” is good and should be kept.

The last change “subjected to the tests in this chapter” is less clear than the original which should be retained.

VANDERSALL, H.: This change was required by the acceptance of Proposal 18-16 and results in the addition of additional “concentrates”.

18-18 Log #CP4
(5.1.2)**Final Action: Accept****Submitter:** Technical Committee on Water Additives for Fire Control and Vapor Mitigation,**Recommendation:** Revise text as follows:

5.1.2 The tests detailed in this chapter shall be conducted by an approved independent laboratory using laboratory practices in accordance with ISO/IEC 17025, 40 CFR 160, 40 CFR 792, or equivalent as applicable.

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.**Committee Meeting Action: Accept****Number Eligible to Vote: 13****Ballot Results:** Affirmative: 7 Negative: 2**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Explanation of Negative:**

SHUGARMAN, B.: Acceptance of this proposal would contradict Proposal 18-19 (Log #CP10).

VANDERSALL, H.: It is stated that this proposal removes “unenforceable language as per the NFPA Manual of Style”. In fact, it merely removes the stipulation that the test results shall be recorded and made available by the manufacturer on a technical data sheet. This is certainly not unenforceable language. Further, it removes the necessity for the manufacturer to provide the customer with the results of the testing required by this Standard. This proposal should certainly not be sustained by the TC.

Comment on Affirmative:

JOHNSON, C.: This is not an issue of unenforceable language or fixing unenforceable language. This action along with comments 19 and 20 simply rearrange and relocate the text. There is nothing wrong with the current wording but splitting it into 2 sub paragraphs is acceptable.

18-19 Log #CP10
(5.1.2)**Final Action: Accept****Submitter:** Technical Committee on Water Additives for Fire Control and Vapor Mitigation,**Recommendation:** Revise text as follows:

5.1.2* The tests detailed in this chapter shall be conducted by an approved independent laboratory using Good Laboratory Practices (GLP).

A.5.1.2 Good Laboratory Practices should be in accordance with 40 CFR 160, 40 CFR 792, ISO/IEC 17025, or equivalent as applicable.

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.**Committee Meeting Action: Accept****Number Eligible to Vote: 13****Ballot Results:** Affirmative: 7 Negative: 2**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Explanation of Negative:**

JOHNSON, C.: Putting significant text into the appendix allows manufacturers and users alike to ignore the information. This is not the correct direction for the standard to go. Without the text that is targeted for the appendix, the AHJ is unlikely to know how to determine that a laboratory is credible and independent.

VANDERSALL, H.: This appears to be a revision of Proposal 18-18. The same reasoning exists for my negative vote on this Proposal as on the preceding comment.

18-20 Log #CP5
(5.1.3)**Final Action: Reject****Submitter:** Technical Committee on Water Additives for Fire Control and Vapor Mitigation,**Recommendation:** Revise text as follows:

5.1.3 The information developed in response to the requirements of this chapter shall be reported on the manufacturer’s technical data sheet and made available given to potential users.

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.**Committee Meeting Action: Reject****Committee Statement:** Committee feels the current wording is technically correct.**Number Eligible to Vote: 13****Ballot Results:** Affirmative: 9**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.18-21 Log #16
(5.2)**Final Action: Accept in Principle****Submitter:** Blake M. Shugarman, Underwriters Laboratories Inc.**Recommendation:** Revise text to read as follows:**5.2 Wetting Agents Concentrates and Solutions.****Substantiation:** The test names have been proposed to be revised to denote whether the tests are to be conducted with wetting agent concentrate or wetting

agent solution or both. Section 5.2 has been proposed to be revised to indicate both Wetting Agent Concentrates and Solutions.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

5.2 Wetting Agent Concentrates and Solutions.**Committee Statement:** Corrected text is grammatically correct.**Number Eligible to Vote: 13****Ballot Results:** Affirmative: 7 Negative: 2**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Explanation of Negative:**

JOHNSON, C.: See my Explanation of Negative on 18-11 (Log #CP13). So long as the definition is clear, let’s keep the text clean and concise by removing superfluous words. “Wetting agents and solutions” is accurate.

VANDERSALL, H.: Same thought and negative response as stated in Comment 6 (Proposal 18-16) above. So many of the proposed changes do not result in an improvement but merely a change in the text.

18-22 Log #8
(5.2.1)**Final Action: Accept in Principle****Submitter:** Blake M. Shugarman, Underwriters Laboratories Inc.**Recommendation:** Revise text to read as follows:

5.2.1 Concentrate Pour Point. The pour point of the concentrate shall be determined in accordance with ASTM D 97.

Substantiation: The proposed revision provides clarification and consistency between NFPA 18 and NFPA 18A.**Committee Meeting Action: Accept in Principle**

Revise text to read as follows:

5.2.1 Concentrate Pour Point. The pour point of the wetting agent concentrate shall be determined in accordance with ASTM D 97.

Committee Statement: Reworded section meets submitter’s intent.**Number Eligible to Vote: 13****Ballot Results:** Affirmative: 7 Negative: 2**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Explanation of Negative:**

JOHNSON, C.: I have no problem with adding the word “concentrate” to the title of the test; however, having done that adding the extra words within the text serves no useful purpose.

Also see my Explanation of Negative on 18-11 (Log #CP13).

VANDERSALL, H.: See my Explanation of Negative on Proposal 18-11 (Log #CP13).

18-23 Log #CP16

Final Action: Accept**(5.2.1, 5.2.2, 5.2.3, and 5.2.4)****Submitter:** Technical Committee on Water Additives for Fire Control and Vapor Mitigation,**Recommendation:** Make changes to 5.2.1, 5.2.2, 5.2.3, and 5.2.4 to include the word Concentrates into each section heading.**Substantiation:** These changes provide consistency throughout the Standard.**Committee Meeting Action: Accept****Number Eligible to Vote: 13****Ballot Results:** Affirmative: 7 Negative: 2**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Explanation of Negative:**

JOHNSON, C.: See my Explanation of Negative on 18-11 (Log #CP13). The committee needs to reach an agreement on these terms and use them consistently which is not happening by using this section by section approach.

VANDERSALL, H.: See my Explanation of Negative on Proposal 18-11 (Log #CP13).

18-24 Log #9

Final Action: Accept in Principle**(5.2.2)****Submitter:** Blake M. Shugarman, Underwriters Laboratories Inc.**Recommendation:** Revise text to read as follows:**5.2.2 Concentrate Miscibility.**

5.2.2.1 The concentrate wetting agent shall be miscible in water and result in a homogeneous solution when tested at the manufacturer’s minimum and maximum use concentrations specified for use by the manufacturer. Opalescence shall be considered equivalent to homogeneity.

5.2.2.2 The concentrate miscibility of the wetting agent shall be tested according to the following procedures with the water and concentrate conditioned to the temperature combinations so as to meet the conditions of Table 5.2.2.2:

(1) Five hundred (500) mL (16.9 oz) of deionized or distilled water at conditioned to the test temperature shall be added to a 1 L (0.26 g) glass beaker.

(2) A stirrer, as illustrated in Figure 5.2.2.2, shall be inserted into the water to a depth of 14 ± 0.5 cm ($5\text{-}1/2 \pm 1/4$ in.), shown in the figure.

(3) The speed of the stirrer motor shall be adjusted to 60 rpm \pm 10 rpm.

(4) The required amount of wetting agent concentrate conditioned to the test temperature shall be added to the water within 2 seconds.

(5) After 10 revolutions of the stirrer, rotation shall be stopped and the liquid mixture shall be visually examined, observed. If the solution is visually homogeneous, the number of revolutions shall be recorded and the result recorded as miscible.

(6) If the foam solution is not visually homogeneous, it shall be stirred for an additional 10 revolutions. Opalescence shall be considered to be homogeneous.

(7) The procedure shall be repeated until the solution is visually homogeneous or until the total number of revolutions is equal to 100.

(8) The observations made at each 10-revolution interval, the stirrer rotation shall be stopped and the liquid mixture shall be visually examined for homogeneity shall be recorded. If the solution is visually homogeneous, the number of revolutions shall be recorded and the result recorded as miscible.

(9) If the solution is not visually homogeneous immediately following after 100 revolutions, the result shall be recorded as not miscible.

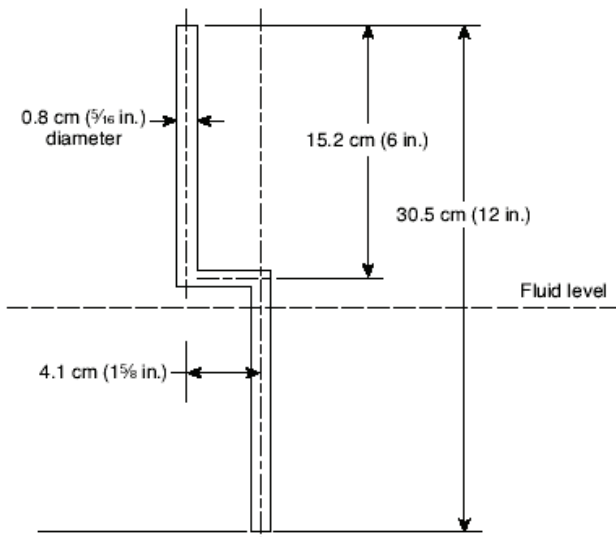
Table 5.2.2.2 Temperature Combinations of Concentrate-Wetting Agent and Water for Miscibility Testing

Water Temperature		Concentrate-Wetting Agent Temperature	
°C	°F	°C	°F
4 ± 1	40 ± 2 (39 ± 1.5)	21 ± 1	70 ± 2 (70 ± 1.5)
21 ± 1	70 ± 2 (70 ± 1.5)	21 ± 1	70 ± 2 (70 ± 1.5)
4 ± 1	40 ± 2 (39 ± 1.5)	4 ± 1	40 ± 2 (39 ± 1.5)
21 ± 1	70 ± 2 (70 ± 1.5)	4 ± 1	40 ± 2 (39 ± 1.5)

(8) At each 10-revolution interval, the stirrer rotation shall be stopped and the liquid mixture shall be visually examined for homogeneity. If the solution is visually homogeneous, the number of revolutions shall be recorded and the result recorded as miscible.

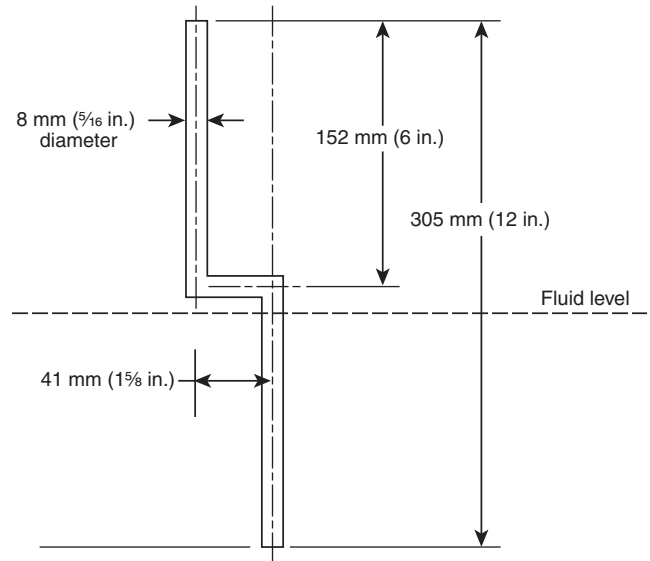
(9) If the solution is not visually homogeneous immediately following 100 revolutions, the result shall be recorded as not miscible.

Water Temperature		Concentrate-Wetting Agent Temperature	
°C	°F	°C	°F
4 ± 1	40 ± 2 (39 ± 1.5)	21 ± 1	70 ± 2 (70 ± 1.5)
21 ± 1	70 ± 2 (70 ± 1.5)	21 ± 1	70 ± 2 (70 ± 1.5)
4 ± 1	40 ± 2 (39 ± 1.5)	4 ± 1	40 ± 2 (39 ± 1.5)
21 ± 1	70 ± 2 (70 ± 1.5)	4 ± 1	40 ± 2 (39 ± 1.5)



Note: All measurements are approximate.

Figure 5.2.2.2 Stirrer Shaft for Miscibility Test.



Note: All measurements are approximate.

Figure 5.2.2.2 Stirrer Shaft for Miscibility Test.

Substantiation: The proposed revision provides clarification and consistency between NFPA 18 and NFPA 18A.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

5.2.2 Wetting Agent Concentrate Miscibility.

5.2.2.1 The concentrate shall be miscible in water and result in a visual homogeneous solution when tested at the minimum and maximum concentration specified for use by the manufacturer. Opalescence shall be considered to be visual homogeneous.

5.2.2.2 The concentrate miscibility shall be tested according to the following procedures with the water and concentrate conditioned to the temperature combinations of Table 5.2.2.2:

- (1) Five hundred (500) mL (16.9 oz) of de-ionized or distilled water conditioned to the test temperature shall be added to a 1 L (0.26 gal) glass beaker.
- (2) A stirrer, as illustrated in Figure 5.2.2.2, shall be inserted into the water to a depth of 14 ± 0.5 cm (5-1/2 ± 1/4 in.).
- (3) The speed of the stirrer motor shall be adjusted to 60 rpm ± 10 rpm.
- (4) The required amount of concentrate conditioned to the test temperature shall be added to the water within 2 seconds.
- (5) After 10 revolutions of the stirrer, rotation shall be stopped and the liquid mixture shall be visually examined. If the solution is visually homogeneous, the number of revolutions shall be recorded and the result recorded as miscible.
- (6) If the solution is not visually homogeneous, it shall be stirred for an additional 10 revolutions.
- (7) The procedure shall be repeated until the solution is visually homogeneous or until the total number of revolutions is equal to 100.

Committee Statement: The Committee’s rewrite of this section meets submitter’s intent.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 7 Negative: 2

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: See my Explanation of Negative on 18-11 (Log #CP13).

There are parts of this proposal that improve the overall understanding of the test. These can be added in at the comment stage once the committee can reach agreement on the use of terms.

VANDERSALL, H.: The addition of Concentrate prior to Miscibility, and the use of concentrate in several other locations is necessary if Proposal 18-16 is accepted. If not, this needs to be reworded. Several of the changes within this Section do improve the clarity and understanding of the Section and should be retained even if the wetting agent and its solutions are segregated.

18-25 Log #10

Final Action: Accept in Principle

(5.2.3)

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

5.2.3* Concentrate Separation.

5.2.3.1 Wetting agent concentrate agents shall display no tendency to stratify or otherwise not separate when stored undisturbed for 30 days in closed, sealable, 100 cc transparent containers at temperatures of 0°C ± 2°C (32°F ± 3°F) and 49°C ± 2°C (120°F ± 3°F), 0°C and 48.9°C (32°F and 120°F).

5.2.3.2 No visible-Visible separation characterized by the formation of two or more distinct layers, stratification, or precipitation shall occurring during the course of the test shall be considered as an indication of separation. The separation test shall be conducted in a sealable, 100 cc transparent container.

5.2.3.3 The test shall be conducted for 30 days.

5.2.3.4 No visible separation, stratification, or precipitation shall occur during the course of the test.

A.5.2.3 Solutions in such concentrations as are specified for use by the manufacturer are to be used, and an average of three determinations should be the reported value. Measurements are carried out on any standard instrument, such as the du Nuoy Tensiometer, and the proper correction factor applied to the determined values.

Substantiation: The proposed revisions provide clarification and consistency between NFPA 18 Section 5.3.2, NFPA 18A Section 5.5, and NFPA 18 Section 5.2.3 and introduce tolerances for the storage temperatures. The content of 5.2.3.3 and 5.2.3.4 have been incorporated into 5.2.3.1 and 5.2.3.2. The Annex material referenced is not applicable to this test and has been proposed to be deleted here. The minimum storage temperature of 0°C is defined in 7.2. The maximum storage temperature of 49°C is consistent with the maximum intended exposure temperature of the concentrate for separation, viscosity, and corrosion tests.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

5.2.3* Wetting Agent Concentrate Separation.

5.2.3.1 Wetting agent concentrate shall not stratify or otherwise separate when stored undisturbed for 30 days in closed, sealable, 100 mL transparent containers at temperatures of 0°C ± 2°C (32°F ± 3°F) and 49°C ± 2°C (120°F ± 3°F).

5.2.3.2 Visible separation shall be considered the formation of two or more distinct layers, stratification, or precipitation occurring during the course of the test shall be considered as an indication of separation.

Committee Statement: Rewording of proposal meets submitter's intent.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 7 Negative: 2

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: See my Explanation of Negative on 18-11 (Log #CP13).

The rewrite accepted during the committee meeting improves the text however some of the sentence structure is incorrect and adds confusion to the wording. The rewrite should be edited to correct the structure issues and retained.

VANDERSALL, H.: The addition of concentrate in several locations is necessary if Proposal 18-16 is accepted. If not, this proposal needs to be rejected. Several of the changes within this Section improve the clarity and understanding of the Section and should be retained even Proposal 18-16 is rejected.

18-26 Log #11
(5.2.4)

Final Action: Reject

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Delete text as follows:

5.2.4 Impact of Low Temperature on Surface Tension:

5.2.4.1 Surface tension of wetting agent solution prepared from wetting agents stored at 18°C (0°F) shall not vary more than 5 dynes/cm from the initial measurement determined in accordance with 5.3.1.

5.2.4.2 For 16 hours, 100 cc of the wetting agent shall be placed in a clean closed container and conditioned at 18°C (0°F).

5.2.4.3 The cooled wetting agent shall be conditioned at 18°C ± 2.7°C (65°F ± 5°F) for not less than 16 hours.

5.2.4.4 A wetting agent solution shall be prepared from the conditioned wetting agent at the manufacturer's minimum and maximum use concentrations.

5.2.4.5 The surface tension of the wetting agent solution shall be measured.

Substantiation: It is proposed that this test be incorporated with the surface tension test described in 5.3.1.

Committee Meeting Action: Reject

Committee Statement: Committee did not want to remove this section, See Proposal 18-27 (Log #CP14).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-27 Log #CP14
(5.2.4)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise text to read as follows:

5.2.4 Impact of Low Temperature Storage of Wetting Agent Concentrate on Surface Tension.

5.2.4.1 Surface tension of wetting agent solution prepared from 100 ml wetting agent concentrate samples stored at -18°C ± 2.7°C (0°F ± 5°F) for 16 hours and then conditioned to 18°C ± 2.7°C (65°F ± 5°F) shall not vary more than 5 dynes/cm from the initial measurement determined in accordance with 5.3.1.

5.2.4.2 The wetting agent solution shall be prepared at the minimum and maximum concentration specified for use by the manufacturer.

5.2.4.3 The surface tension shall be determined in accordance with ASTM D 1331.

Substantiation: Rewording of section provides clarity on the viscosity testing requirement.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 8 Negative: 1

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: See my Explanation of Negative on 18-11 (Log #CP13).

The rewrite improves the clarity and flow of the section and should be kept with any further edits required once the committee deals with the selection of preferred terms.

18-28 Log #12
(5.2.5)

Final Action: Accept in Principle

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

5.2.5* Concentrate pH. The pH of the concentrate wetting agent shall be between 6 and 9 at 18°C ± 2.7°C (65°F ± 5°F).

~~**A.5.2.5** The pH of aqueous solutions of wetting agents is a measure of the acidity and alkalinity of the solution. Variations substantially below 7 or above 12 can either result in a serious increase in corrosion rate or have material effect on its value in fire protection and fire extinguishment.~~

~~pH should be measured in accordance with standard practice procedures on a standard-type pH meter at water temperatures of 15.6°C ± 0.6°C (60°F ± 1°F). Any municipal waterworks laboratory can perform these tests.~~

Substantiation: The proposed revisions provide clarification and consistency between NFPA 18 and NFPA 18A. The Annex material is specific to aqueous solutions and proposed to be deleted.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

5.2.5 Wetting Agent Concentrate pH. The pH of the concentrate shall be between 6 and 9 at 18°C ± 2.7°C (65°F ± 5°F), in accordance with ASTM D1293, 99 - (Reapproved 2005).

Committee Statement: Submitter approved changes for consistency with actions taken on other sections. The Committee wanted to bring in the ASTM Standard for technical clarity.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 7 Negative: 2

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: See my Explanation of Negative on 18-11 (Log #CP13).

The rewrite implies that the limits placed on pH are in accordance with ASTM D1293 when it is the test procedure that is in accordance with ASTM D1293.

The inclusion of the date of acceptance and reapproval of the standard is not necessary within the text. These details should be included in the list of referenced documents.

VANDERSALL, H.: See my Explanation of Negative on Proposal 18-11 (Log #CP13).

18-29 Log #13
(5.2.6)

Final Action: Accept in Principle

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

5.2.6 Concentrate Viscosity.

5.2.6.1 The results of viscosity testing shall be reported in terms of absolute viscosity (centipoise).

5.2.6.2 Viscosity determinations shall be made at 18°C ± 2.7°C (65°F ± 5°F) in accordance with 5.2.6.3.

5.2.6.3 The viscosity of the wetting agent concentrate shall be measured at with the concentrate conditioned to the temperatures of 2°C (35°F), 21°C (70°F), and 49°C (120°F) according to the following procedure:

(1) A Brookfield viscometer, model LVT or LVF, or the equivalent, set at 60 rpm with the appropriate spindle (No. 2 for viscosities from 1 to 500 centipoise and No. 4 for viscosities greater than 500 centipoise), shall be used to measure the viscosity.

(2) A straight-sided glass beaker that contains approximately 800 mL (27 oz) of the test sample shall be positioned under the viscometer.

(3) The spindle shall be immersed in the concentrate to the indicated depth, indicated on the spindle.

(4) The viscometer then shall be turned on, and the spindle shall be allowed to rotate for 1 minute prior to taking the measurement.

(5) Triplicate measurements shall be made, stirring gently between each measurement, and the viscosity for each measurement of each the sample shall be calculated in centipoise, using the applicable multiplier (5 for spindle No. 2 and 100 for spindle No. 4). The viscosity measurements for each sample are to be averaged.

Substantiation: The proposed revisions provide clarification and consistency between NFPA 18 and NFPA 18A.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

5.2.6 Wetting Agent Concentrate Viscosity.

5.2.6.1 The results of viscosity testing shall be reported in terms of absolute viscosity (centipoise).

5.2.6.2 Viscosity determinations shall be made at 18°C ± 2.7°C (65°F ± 5°F) in accordance with 5.2.6.3.

5.2.6.3 The viscosity of the wetting agent concentrate shall be measured with the concentrate conditioned to temperatures of 2°C (35°F +/- 2F), 21°C (70°F +/- 2F), and 49°C (120°F +/- 2F) according to the following procedure:

(1) A Brookfield viscometer, model LVT or LVF, or the equivalent, set at 60 rpm with the appropriate spindle (No. 2 for viscosities from 1 to 500 centipoise and No. 4 for viscosities greater than 500 centipoise), shall be used to measure the viscosity.

(2) A straight-sided vessel containing the concentrate shall be positioned under the viscometer.

(3) The spindle shall be immersed in the concentrate to the depth indicated on the spindle, without allowing the spindle to touch the sides or bottom of the vessel.

(4) The viscometer then shall be turned on, and the spindle shall be allowed to rotate for 1 minute prior to taking the measurement.

(5) Triplicate measurements shall be made, stirring gently between each measurement, and the viscosity for each measurement of each sample shall be calculated in centipoise, using the applicable multiplier (5 for spindle No. 2 and 100 for spindle No. 4). The viscosity measurements for each sample shall be averaged.

Committee Statement: Committee feels the rewording provides clarification of the requirements.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 7 Negative: 2

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: See my Explanation of Negative on 18-11 (Log #CP13).

The rewrite of this section is good and should be considered after the committee determines the preferred usage of the terms "wetting agent," "wetting agent concentrate," etc.

SHUGARMAN, B.: Proposal 18-30 (Log #CP21) better addresses the test method by reference to an appropriate ASTM standard and inclusion of tolerances for the temperature of the wetting agent concentrate.

Comment on Affirmative:

VANDERSALL, H.: Although the word concentrate is added numerous more times, the change in clarity offered by this proposal should be considered.

18-30 Log #CP21

Final Action: Accept

(5.2.6)

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Eliminate Section 5.2.6.2 and incorporate temperature requirement into new number Section 5.2.6.2, renumber accordingly, as follows:

5.2.6 Wetting Agent Concentrate Viscosity. The viscosity of the wetting agent concentrate shall be measured at the temperatures of 2°C ± 2.7°C (35°F ± 5°F), 18°C ± 2.7°C (65°F ± 5°F), and 49°C ± 2.7°C (120°F ± 5°F) in accordance with ASTM D2196, as modified with the following:

(1) A Brookfield viscometer, LV Series, or the equivalent, set at 60 rpm with the appropriate spindle (No. 2 for viscosities from 1 to 500 centipoise and No. 4 for viscosities greater than 500 centipoise), shall be used to measure the viscosity.

(2) A straight-sided glass beaker that contains approximately 800 mL (27 fl. oz) of the test sample shall be positioned under the viscometer.

(3) The spindle shall be immersed in the concentrate to the depth indicated on the spindle.

(4) The viscometer then shall be turned on, and the spindle shall be allowed to rotate for 1 minute prior to taking the measurement.

(5) Triplicate measurements shall be made, stirring gently between each measurement, and the viscosity of each sample shall be calculated in centipoise, using the applicable multiplier (5 for spindle No. 2 and 100 for spindle No. 4). The viscosity measurements for each sample are to be averaged.

(6) The results of viscosity testing shall be reported in terms of absolute viscosity (centipoise).

Substantiation: The committee feels the three temperatures reflect the upper limit, the lower limit and the standard use temperatures.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 8 Negative: 1

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: See my Explanation of Negative on 18-11 (Log #CP13).

18-31 Log #CP2

Final Action: Reject

(5.2.6.3)

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise text as follows:

5.2.6.3 The viscosity of the wetting agent shall be measured at the temperatures of 2°C (35°F), 21°C (70°F), and 49°C (120°F) according to the following:

(1) A Brookfield viscometer, model LVT or LVF, or the equivalent, set at 60 rpm with the appropriate spindle (No. 2 for viscosities from 1 to 500 centipoise

and No. 4 for viscosities greater than 500 centipoise), shall be used to measure the viscosity.

(2) A straight-sided glass beaker that contains approximately 800 mL (27 oz) of the test sample shall be positioned under the viscometer.

(3) The spindle shall be immersed in the concentrate to the indicated depth.

(4) The viscometer then shall be turned on, and the spindle shall be allowed to rotate for 1 minute prior to taking the measurement.

(5) Triplicate measurements shall be made, stirring gently between each measurement, and the viscosity of the sample shall be calculated in centipoise, using the applicable multiplier (5 for spindle No. 2 and 100 for spindle No. 4).

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.

Committee Meeting Action: Reject

Committee Statement: See Action on Proposal 18-29 (Log #13).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-32 Log #14

Final Action: Accept in Principle

(5.2.7)

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

5.2.7 Concentrate and Solution Toxicity.

5.2.7.1* Wetting agents concentrate and wetting agent solution prepared at the maximum concentration specified for use by the manufacturer shall be tested in accordance with the following EPA OPPTS tests or their equivalent:

- (1) 870.1100 Acute Oral Toxicity
- (2) 870.1200 Acute Dermal Toxicity
- (3) 870.2400 Acute Eye Irritation
- (4) 870.2500 Acute Dermal Irritation

5.2.7.2 The wetting agent concentrate and wetting agent solution prepared at the maximum concentration specified for use by the manufacturer use solution shall not exceed the toxicity limits established in Table 5.2.7.2 when tested in accordance with 5.2.7.1.

A.5.2.7.1 There are other organizations, such as the Organization for Economic Cooperation and Development (OECD), having similar tests that can be substituted with the approval of the authority having jurisdiction.

Substantiation: Section 5.2.7.1 specifies the test method and section 5.2.7.2 specifies the acceptance criteria.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

5.2.7 Wetting Agent Concentrate and Solution Toxicity.

5.2.7.1* Wetting agent concentrate and wetting agent solution prepared at the maximum concentration specified for use by the manufacturer shall be tested in accordance with the following EPA OPPTS tests or their equivalent:

- (1) 870.1100 Acute Oral Toxicity
- (2) 870.1200 Acute Dermal Toxicity
- (3) 870.2400 Acute Eye Irritation
- (4) 870.2500 Acute Dermal Irritation

A.5.2.7.1 There are other organizations, such as the Organization for Economic Cooperation and Development (OECD), having similar tests that can be substituted with the approval of the authority having jurisdiction.

5.2.7.2 The wetting agent concentrate and wetting agent solution prepared at the maximum concentration specified for use by the manufacturer shall not exceed the toxicity limits established in Table 5.2.7.2 when tested in accordance with 5.2.7.1.

Committee Statement: Additional wording was added for consistency with other committee actions.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 8 Negative: 1

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

SHUGARMAN, B.: The health effects of wetting agent concentrate(s) and/or wetting agent solution(s) are to be evaluated to and comply with any specified requirements of the US EPA Office of Prevention, Pesticides and Toxic Substances Guidelines, or the equivalent. The Technical Committee on Water Additives for Fire Control and Vapor Mitigation is not charged with determining acceptable health effects limits.

Comment on Affirmative:

JOHNSON, C.: See my Explanation of Negative on 18-11 (Log #CP13) for regarding product descriptions.

I agree with this proposal; however it contradicts 18-4.

VANDERSALL, H.: I agree with this Proposal. However, it appears to be in direct opposition to 18-4. If Proposal 18-4 is rejected, this Proposal should be considered.

18-33 Log #CP17
(5.2.7)**Final Action: Accept****Submitter:** Technical Committee on Water Additives for Fire Control and Vapor Mitigation.**Recommendation:** Revise current toxicity section as indicated and add a new Aquatic Toxicity Section as follows:

5.2.7 Toxicity

5.2.7.1 Mammalian Toxicity

5.2.7.1.1 (Insert wording found under current Section 5.2.7.1 here.)

5.2.7.1.2 (Insert wording found under current Section 5.2.7.2 here)

5.2.7.2 Wetting Agent Concentrate Aquatic Toxicity. The LC50 of the wetting agent concentrate shall be greater than 10 mg/L when tested in accordance with all of the following:

(1) Wetting agent concentrate samples shall be tested, using rainbow trout (*Oncorhynchus mykiss*), in accordance with U.S. EPA Office of Prevention, Pesticides and Toxic Substances, Ecological Effects Test Guidelines, OPPTS 850.1075, Fish Acute Toxicity Test, Freshwater and Marine, in soft water as defined in ASTM E 729, Standard Guide for Conducting Acute Toxicity Tests on Test Materials with Fishes, Macroinvertebrates, and Amphibians.

(2) In accordance with OPPTS 850.1075, 10 fish that are 60 days \pm 15 days post-hatch shall be exposed under static conditions to each level of a wetting agent solution that contains soft water for 96 hours at 12°C \pm 1°C (54°F \pm 2°F).

Substantiation: Committee feels the inclusion of aquatic toxicity is required in this Standard.**Committee Meeting Action: Accept****Number Eligible to Vote: 13****Ballot Results:** Affirmative: 7 Negative: 2**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Explanation of Negative:**

GREINER, M.: The problem with setting an arbitrary limit of any number (not just 10 ppm), as one can see by the example below, is there is no Engineering benefit as it will not accomplish the objective of eliminating fish kills if wetting agent solutions (Class A foam or Class B foam for that matter) are allowed to enter the waterway. The only thing setting an arbitrary LC50 value of 10 ppm accomplishes is potentially restriction of trade and competition.

As an example let's look at two products:

Product A has an aquatic toxicity of 9 ppm (LC50 of 9 is an indicator of the ppm it takes to kill 50% of the fish.) Product A would not pass the arbitrary proposed limits of 10 ppm. When the product is applied at its UL Listed proportioning rate of 0.1% it is applied at 1000 ppm (0.1% x 1,000,000 = 1000). This means that while Product A did not pass the limits of 10 when applied at its UL Listed proportioning rate of 0.1% (1000 ppm) one would expect that if 9 ppm killed 50% of the fish during the aquatic toxicity test; then, 1000 ppm if allowed to enter into a water body would cause a fish kill.

Product B has an aquatic toxicity of 100 ppm (LC50 of 100 is an indicator of the ppm it takes to kill 50% of the fish.) It would pass the arbitrary proposed limits of 10 ppm. When the product is applied at its UL Listed proportioning rate of 0.1% it is applied at 1000 ppm (0.1% x 1,000,000 = 1000). This means that while product A passes the limits of 10 when applied at its UL Listed proportioning rate of 0.1% (1000 ppm) surely if 100 ppm killed 50% of the fish during the aquatic toxicity test; then, 1000 ppm if allowed to enter into a water body would cause a fish kill.

The result of Product A or Product B entering into the water body would have the same initial impact... a fish kill. After the initial impact, the prolonged impact is a function of the products BOD - Biological Oxygen Demand and COD - Chemical Oxygen Demand. Assume that in this example, Product A the BOD and COD are less than that of Product B; therefore, while both would have the same initial impact the prolonged effect of Product A would dissipate much faster than Product B even though Product A would not meet the arbitrary value it would in fact have a less impact on the environment than Product B.

As anyone who analysis this situation on a rational engineering basis can see setting an arbitrary pass/fail aquatic toxicity value of 10 ppm does not accomplish any meaningful objective. There is no correlation between the arbitrary value of 10 ppm to real world proportioning rate or real world environmental impact as illustrated above. Products passing the value will kill the same number of fish as any product that does not pass the value. The only way to set any value that would be meaningful would be to set a value that correlates to the highest proportioning rate of all products listed under the standard. A review of the current products listed under the standard reveals the highest proportioning rate to be 6%. Therefore, if the Aquatic Toxicity Limit (LD50) were set at 60,000 ppm (6% x 1,000,000 = 60,000) then we would be 100% assured that any agent that passed this requirement when entering into the water body would not produce a fish kill. The only issue is that that the highest Aquatic Toxicity of all currently UL Listed products is approx 3,000 ppm. This means that no products currently listed would pass this 60,000 ppm limit.

Since it is established that the arbitrary value of 10 ppm does not correlate with real world nor would it accomplish the object of saving fish and on the other hand a value of 60,000 would guarantee no fish kill; however, we would not have any fire fighting agents ... the only approach from a sound engineering point of view that resolves this issue is make it know to the public and

write best practices verbiage into the standard to keep fire fighting agents and their respective solutions out of the water bodies.

SHUGARMAN, B.: The ecological effects of wetting agent concentrate(s) and/or wetting agent solution(s) are to be evaluated to and comply with any specified requirements of the US EPA Office of Prevention, Pesticides and Toxic Substances Guidelines, or the equivalent. The Technical Committee on Water Additives for Fire Control and Vapor Mitigation is not charged with determining acceptable ecological effects limits.

Comment on Affirmative:

JOHNSON, C.: I agree with this proposal but the product nomenclature should be brought into compliance with committee decision.

18-34 Log #33
(5.2.7.3)**Final Action: Reject****Submitter:** Bob Carter, Hazard Control Technologies, Inc.**Recommendation:** Add text to read as follows:

5.2.7.3 Aquatic Toxicity:

5.2.7.3.1: The water additive and/or constituent Chemical Abstract Substance (CAS) ingredients must be submitted to USEPA (or federal AHJ equivalent) for evaluation. All CAS items must be included on US EPA monitored TSCA (or federal AHJ equivalent).

5.2.7.3.2: Notification must be made by manufacturer or importing agency responsible for the sale and use of the water additive to be sure the water additive is properly registered with the appropriate federal authorities having jurisdiction for the manufacture, transport and use of the water additive in any foreign national market.

5.2.7.3.3: Manufacturerers their agents and assigns should make every effort to encourage the safe handling of fire water run-off to help ensure reducing the risk of contaminating aquatic water bodies.

Substantiation: None given.**Committee Meeting Action: Reject****Committee Statement:** Proposal lacks technical justification and a test for determining the toxicity to aquatic life.**Number Eligible to Vote: 13****Ballot Results:** Affirmative: 8 Negative: 1**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Explanation of Negative:**

GREINER, M.: Looking at my comment under proposal 18-33, since there is no Engineering substantiation for setting LD50 at 10 ppm the only way to prevent fish kill is to incorporate verbiage to keep the wetting agent solutions out of the waterways and promote safe handling of the products which is what this proposal is attempting to accomplish.

18-35 Log #CP18
(5.2.7.3)**Final Action: Accept****Submitter:** Technical Committee on Water Additives for Fire Control and Vapor Mitigation.**Recommendation:** Revise text as follows:

5.2.7.3* Wetting Agent Concentrate Biodegradability. The biodegradability of the wetting agent concentrate shall be evaluated in accordance with this Section and the results recorded on the manufacturer's data sheet.

5.2.7.3.1 The evaluation shall be in accordance with U.S. EPA Office of Prevention, Pesticides and Toxic Substances, Fate, Transport, and Transformation Test Guidelines, OPPTS 835.3110, Ready Biodegradability, Section M, CO2 Evolution (Modified Sturm) Test, or equivalent.

5.2.7.3.2 Testing shall be conducted for a minimum of 28 days and shall be continued until an oxygen depletion plateau is reached.

5.2.7.3.3 Testing shall be discontinued at the end of 42 days, even if the plateau has not been reached.

5.2.7.3.4 At least one reference substance shall be used to monitor inoculum activity.

Substantiation: Committee feels this is necessary to provide clarification to the user of the Standard.**Committee Meeting Action: Accept****Number Eligible to Vote: 13****Ballot Results:** Affirmative: 8 Negative: 1**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Explanation of Negative:**

SHUGARMAN, B.: The biodegradability of wetting agent concentrate(s) and/or wetting agent solution(s) is to be evaluated to and comply with any specified requirements of the US EPA Office of Prevention, Pesticides and Toxic Substances Guidelines, or the equivalent. The Technical Committee on Water Additives for Fire Control and Vapor Mitigation is not charged with determining acceptable biodegradability criteria.

Table 5.2.8.2 Test Liquid, Coupon Immersion and Incubator Temperature Test Conditions

Test Liquid	Coupon Immersion and Incubator Temperature Test Conditions							
	Total Immersion				Partial Immersion			
	°C	°F	°C	°F	°C	°F	°C	°F
Concentrate	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)
Minimum Use Concentration	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)
Maximum Use Concentration	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)

18-36 Log #15
(5.2.8)

Final Action: Reject

Note: This proposal is reported as a “Reject” as it did not receive the simple majority affirmative vote.

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

5.2.8* Uniform Corrosion with Wetting Agent Concentrate and Solutions.

5.2.8.1 Testing of the corrosive effects of wetting agent concentrate and its solutions prepared at the minimum and maximum concentration specified for use by the manufacturer shall be conducted in accordance with either NACE Standard Test Method TM0169, or ASTM G 1 and ASTM G 31, and in accordance with 5.2.8.2 through 5.2.8.7.

5.2.8.2 ~~Results.~~ The results of the testing shall be included in the manufacturer’s technical data sheet.

5.2.8.2 ~~Samples.~~ The wetting agent concentrate and its solutions prepared at the minimum and maximum concentrations specified for use by the manufacturer, shall be tested for corrosion with coupons prepared from samples of 4130 mild steel, 2024-T3 aluminum, and UNS C27000 yellow brass (65 percent copper, 35 percent zinc) for each of the coupon immersion and incubator temperature test conditions specified in Table 5.2.8.2.
(See **Table 5.2.8.2** shown above.)

5.2.8.2.1 The wetting agent and its solutions shall be tested at the maximum and minimum use concentrations specified by the manufacturer. A minimum of three coupons of each material shall be exposed to each test liquid for each test condition. A minimum of one control coupon of each material shall also be tested without liquid immersion.

5.2.8.3 Marking and Measurement. Each coupon, approximately 25 mm × 102.6 mm × 3.2 mm (1 in. × 4 in. × 1/8 in.), shall be marked (by vibrating engraver) with a unique identification code, drilled in the upper center to insert the braided Dacron® string used to suspend it, and then its length, width, and thickness measured to the nearest 0.01 mm (0.000394 in.) for each dimension (length, width, and thickness).

5.2.8.4 Cleaning and Drying. Each coupon shall be degreased and rinsed in tap water.

5.2.8.4.1 The degreased coupon shall not be touched with a bare hand.

5.2.8.4.2 Procedure for Cleaning.

5.2.8.4.2.1 The coupons shall be cleaned chemically as described in Table 5.2.8.4.2.1, rinsed in distilled water, wiped to remove the water film, and dried at approximately 55°C (130°F) for 15 to 30 minutes.

5.2.8.4.2.2 The coupon weight shall be recorded for use in determining weight loss at the end of the 90-day storage period.

5.2.8.4.2.3 The coupons shall be cooled to room temperature, ~~shall be weighed to 0.1 mg (0.00154 grain), and shall be used immediately or stored in a desiccator until use.~~

5.2.8.4.3 The coupon weight shall be recorded for use in determining weight loss at the end of the 90-day storage period.

5.2.8.5 Test Set-Up. One coupon shall be suspended by a length of braided Dacron fishing line in a 0.95 L (32 oz) glass jar in such a way that the coupon does not touch the sides or bottom of the jar.

5.2.8.5.1 Each jar shall contain 0.8 L (24 oz) of liquid for total immersion tests or 0.4 L (12 oz) of liquid for partial immersion tests.

5.2.8.5.2 For total immersion tests, the coupon shall be completely covered with liquid.

5.2.8.5.3 For partial immersion tests, the coupon shall be suspended so that 50 % ± 5 % of one-half its length is immersed in the liquid and 50 % ± 5 % of one-half its length is exposed to the vapor.

5.2.8.5.3 For total immersion tests, the coupon shall be completely covered with liquid.

5.2.8.5.4 Each jar shall be closed and sealed with a screw cap, labeled with coupon identification and starting date, and put in an incubator at 21°C or 49°C (70°F or 120°F), dependent on the desired test condition.

5.2.8.6 Test Duration and Completion. Jars containing the test liquid (three at each exposure and temperature) shall stand undisturbed for 90 days.

5.2.8.6.1 At the end of the 90-day test period, the coupons shall be removed from the liquid and rinsed under running water to remove loosely attached corrosion products.

5.2.8.6.2 The coupons shall be lightly scrubbed with a toothbrush or other nonmetallic brush to aid in removal of scale.

5.2.8.6.3 The coupons shall be cleaned chemically using the same procedures that were used initially in accordance with Table 5.2.8.4.2.1.

5.2.8.6.4 A clean, unused coupon shall be cleaned in the same manner to serve as a control for weight lost during the cleaning process.

5.2.8.6.5 After rinsing in distilled water, oven-drying, and cooling the coupons, the final weight of each coupon shall be determined to 0.1 mg (0.00154 grain).

5.2.8.7 Corrosion Weight.

5.2.8.7.1 The corrosion weight (*Cr*) in mils per year (mpy) (MPY) shall be calculated for each sample as follows:

$$Cr = \frac{534}{\rho} \cdot \left[\left(\frac{W_{ti} - W_{tf}}{A_t \cdot t_t} \right) - \left(\frac{W_{ci} - W_{cf}}{A_c \cdot t_c} \right) \right]$$

where:

- Cr* = corrosion rate (mpy)
- W_{ti}* = initial test coupon weight (mg)
- W_{tf}* = final test coupon weight (mg)
- W_{ci}* = initial control coupon weight (mg)
- W_{cf}* = final control coupon weight (mg)
- A_t* = surface area of the test coupon (in²)
- A_c* = surface area of the control coupon (in²)
- t_t* = exposure of the test coupon (hours)
- t_c* = exposure of the control coupon (hours)
- ρ* = density of the alloy [g/cm³ (lb/in³)] as follows:

- 4130 steel = 7.86 g/cm³ (0.28 lb/in³);
- yellow brass = 8.53 g/cm³ (0.3 lb/in³);
- 2024-T3 aluminum = 2.77 g/cm³ (0.1 lb/in³)

where:

- Cr* = corrosion rate (mpy)
- W_{ti}* = initial coupon weight (mg)
- W_{tf}* = final coupon weight (mg)
- W_{tc}* = weight loss of the control (mg)
- A* = area of the coupon (in²)
- t* = exposure (hours)
- p* = density of the alloy [g/cm³ (lb/in³)] as follows:

- 4130 steel = 7.86 g/cm³ (0.28 lb/in³);
- yellow brass = 8.53 g/cm³ (0.3 lb/in³);
- 2024-T3 aluminum = 2.77 g/cm³ (0.1 lb/in³)

5.2.8.7.2 Results of replicate tests shall be averaged and rounded to the nearest 0.1 mpy.

Table 5.2.8.3 Test Liquid, Coupon Immersion and Incubator Temperature Test Conditions

Test Liquid	<u>Coupon Immersion and Incubator Temperature Test Conditions</u>							
	<u>Total Immersion</u>				<u>Partial Immersion</u>			
	<u>°C</u>	<u>°F</u>	<u>°C</u>	<u>°F</u>	<u>°C</u>	<u>°F</u>	<u>°C</u>	<u>°F</u>
Concentrate	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)
Minimum Use Concentration	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)
Maximum Use Concentration	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)	21 ± 2	(70 ± 4)	49 ± 3	(120 ± 5)

5.2.8.8 For continuous storage, manufacturer’s guidance should be sought for materials of construction or coatings other than those tested. Wetting agents, although they can have limited corrosiveness, exhibit a tendency to accelerate corrosion due to the cleaning and penetrating action and will penetrate and loosen unbonded coatings.

5.2.8.8.4 Common degreasers can include all-purpose cleaners and dishwasher soaps. The chosen degreaser should be used for all comparative testing.

Substantiation: The proposed revisions provide consistency between NFPA 18 and NFPA 18A. The proposed revisions to the corrosion rate formula includes all of the variables that are measured.

The addition of A.5.2.8.4 is the same information as NFPA 18A A.5.2.7.7.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

5.2.8* Uniform Corrosion with Wetting Agent Concentrate and Solutions.

5.2.8.1 Testing of the corrosive effects of wetting agent concentrate and its solution prepared at the minimum and maximum concentration specified for use by the manufacturer shall be conducted in accordance with either NACE Standard Test Method TM0169, or ASTM G 1 and ASTM G 31, and in accordance with 5.2.8.3 through 5.2.8.8.

5.2.8.2 Results. The results of the testing shall be included in the manufacturer’s technical data sheet.

5.2.8.3 Samples. Each test liquid, the wetting agent concentrate and its solutions prepared at the minimum and maximum concentrations specified for use by the manufacturer, shall be tested for corrosion with coupons prepared from 4130 mild steel, 2024-T3 aluminum, and UNS C27000 yellow brass (65 percent copper, 35 percent zinc) for each of the coupon immersion and incubator temperature test conditions specified in Table 5.2.8.3.

(See Table 5.2.8.3 shown on the following page.)

5.2.8.3.1 A minimum of three coupons of each material shall be exposed to each test liquid for each test condition. A minimum of one control coupon of each material shall also be tested without liquid immersion.

5.2.8.4 Marking and Measurement. Each coupon, approximately 25 mm × 102.6 mm × 3.2 mm (1 in. × 4 in. × 1/8 in.), shall be marked by vibrating engraver with a unique identification code, drilled in the upper center to insert the braided polyester string used to suspend it, and then its length, width, and thickness measured to the nearest 0.01 mm (0.000394 in.)

5.2.8.5 Cleaning and Drying. Each coupon shall be degreased and rinsed in tap water.

5.2.8.5.1 The degreased coupon shall not be touched with a bare hand.

5.2.8.5.2 Procedure for Cleaning.

5.2.8.5.2.1 The coupons shall be cleaned chemically as described in Table 5.2.8.5.2.1, rinsed in distilled water, wiped to remove the water film, and dried at approximately 55°C (130°F) for 15 to 30 minutes.

5.2.8.5.2.2 The coupons shall be cooled to room temperature, weighed to 0.1 mg (0.00154 grain), and used immediately or stored in a desiccator until use.

5.2.8.5.3 The coupon weight shall be recorded for use in determining weight loss at the end of the 90-day storage period.

5.2.8.6 Test Set-Up. One coupon shall be suspended by a length of braided polyester fishing line in a 0.95 L (32 oz) glass jar in such a way that the coupon does not touch the sides or bottom of the jar.

5.2.8.6.1 Each jar shall contain 0.8 L (24 oz) of liquid for total immersion tests or 0.4 L (12 oz) of liquid for partial immersion tests.

5.2.8.6.2 For total immersion tests, the coupon shall be completely covered with liquid.

5.2.8.6.3 For partial immersion tests, the coupon shall be suspended so that 50 % ± 5 % of its length is immersed in the liquid and 50 % ± 5 % of its length is exposed to the vapor.

5.2.8.6.4 Each jar shall be closed and sealed with a screw cap, labeled with coupon identification and starting date, and put in an incubator at 21°C or 49°C (70°F or 120°F), dependent on the desired test condition.

5.2.8.7 Test Duration and Completion. Jars containing the test liquid (three at each exposure and temperature) shall stand undisturbed for 90 days.

5.2.8.7.1 At the end of the 90-day test period, the coupons shall be removed from the liquid and rinsed under running water to remove loosely attached corrosion products.

5.2.8.7.2 The coupons shall be lightly scrubbed with a toothbrush or other nonmetallic brush to aid in removal of scale.

5.2.8.7.3 The coupons shall be cleaned chemically using the same procedures that were used initially in accordance with Table 5.2.8.4.2.1.

5.2.8.7.4 A clean, unused coupon shall be cleaned in the same manner to serve as a control for weight lost during the cleaning process.

5.2.8.7.5 After rinsing in distilled water, oven-drying, and cooling the coupons, the final weight of each coupon shall be determined to 0.1 mg (0.00154 grain).

5.2.8.8 Corrosion Rate.

5.2.8.8.1* The corrosion rate (*Cr*) in mils per year (mpy) shall be calculated for each sample as follows:

$$Cr = 534 \left(\frac{W_{ti} - W_{tf} - W_{tc}}{At\rho} \right)$$

where:

- Cr* = corrosion rate (mpy)
- W_{ti}* = initial test coupon weight (mg)
- W_{tf}* = final test coupon weight (mg)
- W_{tc}* = initial control coupon weight (mg)
- W_{cf}* = final control coupon weight (mg)
- A_t* = surface area of the test coupon (in²)
- A_c* = surface area of the control coupon (in²)
- t* = exposure of the test coupon (hours)
- t_c* = exposure of the control coupon (hours)
- ρ* = density of the alloy [g/cm³ (lb/in³)] as follows:

- 4130 steel = 7.86 g/cm³ (0.28 lb/in³);
- yellow brass = 8.53 g/cm³ (0.3 lb/in³);
- 2024-T3 aluminum = 2.77 g/cm³ (0.1 lb/in³);

$$Cr = 534 \left(\frac{W_{ti} - W_{tf} - W_{tc}}{At\rho} \right)$$

where:

- Cr* = corrosion rate (mpy)
- W_{ti}* = initial weight of test coupon (mg)
- W_{tf}* = final weight of test coupon (mg)
- W_{tc}* = weight loss of the control coupon (mg)
- A* = surface area of the test coupon (in²)
- t* = exposure of the test coupon (hours)
- ρ* = density of the alloy [g/cm³ (lb/in. 3)] as follows:
- 4130 steel = 7.86 g/cm³ (0.28 lb/in. 3);
- yellow brass = 8.53 g/cm³ (0.3 lb/in. 3);
- 2024-T3 aluminum = 2.77 g/cm³ (0.1 lb/in. 3)

5.2.8.8.2 Results of replicate tests shall be averaged and rounded to the nearest 0.1 mpy.

A.5.2.8 For continuous storage, manufacturer's guidance should be sought for materials of construction or coatings other than those tested. Wetting agents, although they can have limited corrosiveness, exhibit a tendency to accelerate corrosion due to the cleaning and penetrating action and will penetrate and loosen unbonded coatings.

A.5.2.8.5 Common degreasers can include all-purpose cleaners and dishwasher soaps. The chosen degreaser should be used for all comparative testing.

A.5.2.8.8.1 The equation assumes the surface area of the control coupon is approximately the same as the test coupons.

Committee Statement: The Committee feels the revised wording provide consistency between NFPA 18 and NFPA 18A. The proposed revisions to the corrosion rate formula includes all of the variables that are measured.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 6 Negative: 3

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

GEORGE, C.: Use ASTM procedure for calculating corrosion rate.

JOHNSON, C.: For a standard to have meaning there must be accountability through the performance limits. Simply listing them on the technical data sheet (5.2.8.2) is of little use if the AHJ does not have sufficient technical background to interpret the results. Table 4.2.3.1 from NFPA 1150 (current revision with corrections) should be inserted into this document to provide the performance requirements.

Why spend the time clarifying details when the results don't matter enough to require performance.

The formula for determining the corrosion rate comes directly from the NACE standard. It should be used in the same form as it was presented. This maintains credibility and assures that the committee does not become responsible for erroneous modifications that may occur.

Table 5.2.8.3 takes up a lot more space than the simple statement that all tests will be performed at $70 \pm 5^\circ\text{F}$ ($21.1^\circ\text{C} \pm 2.8$) and $120 \pm 5^\circ\text{F}$ ($48.9^\circ\text{C} \pm 2.8$).

VANDERSALL, H.: Paragraph 5.2.8.2 is difficult to understand. There was no Table 5.2.8.2 in the text or in the previous draft of the report. It is proposed that the method of calculating the corrosion rate be changed from that included in the referenced ASTM procedure. This should not be allowed.

18-37 Log #CP30
(5.2.8)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Reword Section 5.2.8 as follows:

5.2.8. Wetting Agent Concentrate Corrosion. Testing of the corrosive effects of wetting agent concentrate shall be conducted ...

5.2.8.2* Samples.

A.5.2.8.2 Testing on additional alloys may be necessary in order to meet the needs of the end user. Wetting agent solutions should be tested for compatibility with the materials with which they will be used in accordance with Chapter 5.

5.3.3.1 Wetting Agent Solution Corrosion. Testing of the corrosive effects of wetting agent solutions shall be conducted...

Substantiation: The proposed change clarifies that this test is to be conducted on both the wetting agent concentrate and wetting agent solution.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Comment on Affirmative:

JOHNSON, C.: The concept of allowing testing with additional materials is good; however, this section is addressing corrosion issues. Compatibility is not the appropriate term here unless compatibility is defined as having a corrosion rate less than X when tested under "specified conditions." For someone who is knowledgeable the careful choice of conditions (temperature, duration, etc.) can give a result that does not meet the intent of the testing.

18-38 Log #CP6
(Table 5.2.8.4.2.1)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise Note under Table 5.2.8.4.2.1 to read as follows

* Cleaning solutions should be discarded as they become used or discolored. If in doubt, they should be replaced. When cleaning exposed coupons, replace the solution for each wetting agent concentrate or solution tested.

A rubber stopper, nonmetallic scrubbing pad or nonmetallic brush, such as a toothbrush may be used.

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-39 Log #CP9
(5.2.8.6.2)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise text as follows:

5.2.8.6.2 The coupons shall be scrubbed with a toothbrush, nonmetallic scouring pad, or other nonmetallic brush to aid in removal of scale.

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-40 Log #24
(5.3)

Final Action: Reject

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Delete the following text:

5.3 Wetting Agent Solutions.

Substantiation: The test names have been proposed to be revised to denote whether the tests are to be conducted with wetting agent concentrate or wetting agent solution or both. The heading of 5.2 has been proposed to be revised to Wetting Agent Concentrates and Solutions. Subsequent sections may also need to be renumbered.

Committee Meeting Action: Reject

Committee Statement: The Committee formed a task group to address the separation of solutions and concentrates. See CP

Number Eligible to Vote: 13

Ballot Results: Affirmative: 8 Negative: 1

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: Section 5.2 changes were addressed in Log 16 which is not a part of our ballot. I believe this makes any changes associated with it invalid as we have not had the opportunity to vote on it.

There was much confusion as the committee meeting as to whether the topic was renaming Chapter 5 or renaming Section 5.2. My own notes show that the name of section 5.2 was revised to read "Wetting Agent Concentrates."

The text "5.3 Wetting Agent Solutions" should not be deleted as it adds some clarity.

18-41 Log #17
(5.3.1)

Final Action: Accept in Principle in Part

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

5.3.1 Solution Surface Tension. Wetting agents when added to water in concentrations specified for use by the manufacturer shall reduce the surface tension to less than 33 dynes/cm when tested at 18°C (65°F) prepared from wetting agent as received from the manufacturer shall be determined in accordance with ASTM D 1331. The surface tension of wetting agent solution prepared in the minimum and maximum concentration specified for use by the manufacturer shall be determined in accordance with ASTM D 1331.

5.3.1.1 The surface tension of wetting agent solution prepared from wetting agent concentrate as received from the manufacturer and conditioned to $18^\circ\text{C} \pm 2.7^\circ\text{C}$ ($65^\circ\text{F} \pm 5^\circ\text{F}$) shall reduce the surface tension to less than 33 dynes/cm.

5.3.1.2 The surface tension of wetting agent solution prepared from wetting agent concentrate stored at -18°C (0°F) for 16 hours and then conditioned to $18^\circ\text{C} \pm 2.7^\circ\text{C}$ ($65^\circ\text{F} \pm 5^\circ\text{F}$) shall not vary more than 5 dynes/cm from the initial measurement determined in accordance with 5.3.1.1.

Substantiation: The proposed revisions combine the Surface Tension test of 5.3.1 and the Impact of Low Temperature on Surface Tension test of 5.2.4.

Committee Meeting Action: Accept in Principle in Part

Revise text to read as follows:

5.3.1 Wetting Agent Solution Surface Tension. The surface tension of wetting agent solution prepared in the minimum and maximum concentration specified for use by the manufacturer shall be determined in accordance with ASTM D 1331.

5.3.1.1 The surface tension of wetting agent solution prepared from wetting agent concentrate as received from the manufacturer and conditioned to $18^\circ\text{C} \pm 2.7^\circ\text{C}$ ($65^\circ\text{F} \pm 5^\circ\text{F}$) shall reduce the surface tension to less than 33 dynes/cm.

Committee Statement: The Committee feels the accepted portion of the proposal meets the submitter's intent, the portion of the proposal that was rejected was rejected due to the committee's intent to maintain the requirements of Section 5.2.4. See Proposal 18-26 (Log # 11).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Comment on Affirmative:

JOHNSON, C.: I agree with this proposal but the product nomenclature should be brought into compliance with committee decision.

18-42 Log #18
(5.3.2)**Final Action: Accept in Principle****Submitter:** Blake M. Shugarman, Underwriters Laboratories Inc.**Recommendation:** Revise text to read as follows:**5.3.2 Solution Separation on Standing.**

5.3.2.1 The wetting ~~Wetting~~ agent solution, in the minimum and maximum concentrations specified for use by the manufacturer, shall display no tendency to stratify or otherwise separate when stored undisturbed standing for 30 days in closed, sealable, 100 cc transparent containers at temperatures of 0°C ± 2°C (32°F ± 3°F), 19.5°C ± 4.5°C (67°F ± 8°F), and 49°C ± 2°C (120°F ± 3°F) ~~the minimum and maximum storage temperatures and at 18°C ± 2.7°C (65°F ± 5°F).~~

5.3.2.2 The Visible separation characterized by the formation of two or more distinct layers, stratification, or precipitation occurring during the course of the test shall be considered as an indication of separation.

Substantiation: The proposed revisions provide clarification and consistency between NFPA 18 Section 5.3.2, NFPA 18A Section 5.5, and NFPA 18 Section 5.2.3 and introduce tolerances for the storage temperatures. The minimum storage temperature of 0°C is defined in 7.2. The maximum storage temperature of 49°C is consistent with the maximum intended exposure temperature of the concentrate for separation, viscosity, and corrosion tests.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

5.3.2 Solution Separation on Standing.

5.3.2.1 The wetting ~~Wetting~~ agent solution, in the minimum and maximum concentrations specified for use by the manufacturer, shall display no tendency to stratify or otherwise separate when stored undisturbed standing for 30 days in closed, sealable, 100 ml transparent containers at temperatures of 0°C ± 2°C (32°F ± 3°F), 19.5°C ± 4.5°C (67°F ± 8°F), and 49°C ± 2°C (120°F ± 3°F) ~~the minimum and maximum storage temperatures and at 18°C ± 2.7°C (65°F ± 5°F).~~

5.3.2.2 The Visible separation characterized by the formation of two or more distinct layers, stratification, or precipitation occurring during the course of the test shall be considered as an indication of separation.

Committee Statement: Submitter changed cc to ml to clarify the intent.**Number Eligible to Vote: 13****Ballot Results:** Affirmative: 8 Negative: 1**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Explanation of Negative:**

JOHNSON, C.: The actual changes have merit, however other issues remain problematic.

See Proposal 18-25 (Log #10) decision by the committee. We cannot assess "tendency" but we can say "shall not separate, stratify..."

The committee should strive for consistency in its actions. This makes it easier for the user (and the preparers for that matter) to follow the process.

18-43 Log #CP7
(5.3.2.2)**Final Action: Accept in Principle****Submitter:** Technical Committee on Water Additives for Fire Control and Vapor Mitigation,**Recommendation:** Revise text as follows:

5.3.2.2 The formation of two or more distinct layers or precipitation occurring during the course of the test shall be ~~considered~~ as an indication of separation.

7. 6.2.2* Separate Supplies. Where portable tanks are not a part of the apparatus, or where it is desired to carry the wetting agent separately for use either with water from portable tanks or with water from other sources of supply, the amount ~~considered~~ necessary shall be carried in a tank connected to proportioning equipment on the apparatus installed in accordance with NFPA 1901.

8. 5.2.8.6.2 The coupons shall be ~~highly~~ gently scrubbed with a toothbrush or other nonmetallic brush to aid in removal of scale.

9. 5.1.2 The tests detailed in this chapter shall be conducted by an approved independent laboratory using laboratory ~~practices~~ procedures in accordance with ISO/IEC 17025, 40 CFR 160, 40 CFR 792, or equivalent as applicable, and the results shall be recorded and made available by the manufacturer on a technical data sheet.

10. 1.6.2 The conversion procedure used for the U.S. units is to multiply the primary SI quantity by the conversion factor and then round the result (if necessary) to the appropriate number of ~~significant digits~~ decimal places.

11. 1.5 Equivalency.

~~Nothing in this standard is intended to prevent the use of new methods or devices, provided sufficient technical data are submitted to the authority having jurisdiction to demonstrate that the new method or devices are equivalent in quality, effectiveness, durability, and safety to those prescribed by this standard.~~

Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency. The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.

Committee Meeting Action: Accept in Principle

Committee Statement: See Committee Action on Committee Proposal 18-12 (Log #4), Committee Proposal 18-13 (Log #5), Committee Proposal 18-14 (Log #6), Committee Proposal 18-24 (Log #9), Committee Proposal 18-25 (Log #10), Committee Proposal 18-26 (Log #11), Committee Proposal 18-28 (Log #12)

Number Eligible to Vote: 13**Ballot Results:** Affirmative: 8 Negative: 1**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Explanation of Negative:**

JOHNSON, C.: This proposal is a mishmash of pieces from throughout the document. In many cases it is not clear where the text came from.

The committee was told that each proposal had to address a single issue. If this is true Proposal 18-43 (Log #CP#7) is certainly in violation.

I recognize that some of these points have been dealt with separately – as they should be. As this proposal appears it is not helpful or clarifying.

18-44 Log #19
(5.3.3)**Final Action: Reject****Submitter:** Blake M. Shugarman, Underwriters Laboratories Inc.**Recommendation:** Delete the following text:~~**5.3.3* Corrosion:**~~

~~5.3.3.1 Testing of the corrosive effects of wetting agents solutions shall be conducted in accordance with 5.2.8 for the manufacturer's recommended minimum and maximum concentrations:~~

~~5.3.3.2 The results of the testing shall be included in the manufacturer's technical data sheet:~~

Substantiation: This section is proposed to be deleted and combined with 5.2.8.

Committee Meeting Action: Reject

Committee Statement: The committee will modify this section in a different proposal

Number Eligible to Vote: 13**Ballot Results:** Affirmative: 9**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.18-45 Log #20
(5.3.4.1)**Final Action: Accept****Submitter:** Blake M. Shugarman, Underwriters Laboratories Inc.**Recommendation:** Revise text to read as follows:**5.3.4.1 Wood Crib Fire Test.**

5.3.4.1.1 The ability of wetting ~~Wetting~~ agent solutions to extinguish wood crib fires shall be determined with solution prepared at the minimum concentrations specified for use by the manufacturer shall be according to the procedures detailed in this section and evaluated to, and comply with, the requirements of UL 711/ULC S508 for Class A fires utilizing a 3-A wood crib.

5.3.4.1.2 The solution shall be applied with test shall be conducted utilizing a nominal 9.5 L (2.5 gal) listed 2-A rated water extinguisher.

Substantiation: The proposed revisions clarify that the wood crib fire test is to be conducted with the minimum concentration specified by the manufacturer and provides consistency, as applicable, with the format and content between NFPA 18 and NFPA 18A.

Committee Meeting Action: Accept**Number Eligible to Vote: 13****Ballot Results:** Affirmative: 9**Ballot Not Returned:** 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.**Comment on Affirmative:**

JOHNSON, C.: The intent of this proposal is to clarify the wording of 5.3.4.1, however the sentences have become overly complex so that it is not clear if the solution preparation, the use, or something else is in accordance with this section and UL 711.

A standard needs to be as clear as possible even if that means having more sentences. This section appears to be a good candidate for further revision at the comment stage.

18-46 Log #21
(5.3.4.2)**Final Action: Reject**

Note: This proposal is reported as a "Reject" as it did not receive the simple majority affirmative vote.

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.**Recommendation:** Revise text to read as follows:**5.3.4.2 Deep-Seated Fire Test.**

5.3.4.2.1 The ability of wetting ~~Wetting~~ agent solutions shall to extinguish deep-seated cotton fires and exhibit less runoff than water shall be determined with solution prepared at the minimum concentration specified for use by the manufacturer according to the procedures detailed in this section when tested in accordance with 5.3.4.2.2 and 5.3.4.2.3.

5.3.4.2.2 Tests shall be conducted three times with plain water and three times with the wetting agent solution prepared at the manufacturer's recommended concentrations. The runoff results of replicate tests shall be averaged.

5.3.4.2.3 The tests shall be conducted as follows using a cylindrical basket of perforated sheet steel, 114 mm (4-1/2 in.) in diameter and 178 mm (7 in.) high, and-ginned cotton and test liquid: weighing 100 g (3.5 oz) shall be used and the test conducted as follows:

(1) To contain the ginned cotton, a perforated cylinder shall be fabricated from Style 1/2 16F or 1/2 13F expanded and flattened steel sheet complying with the dimensions of ASTM F1267. The perforated cylinder shall be 178 mm \pm 3 mm (7 in. \pm 1/8 in.) high with the length of the mesh parallel with the height of the cylinder and 114 mm \pm 3 mm (4-1/2 \pm 1/8 in.) in diameter with a maximum out-of-roundness of 13 mm (1/2 in.).

(2) To accommodate the perforated cylinder, a grid having a height of 152 mm \pm 3 mm (6 in. \pm 1/8 in.) and measuring at least 350 mm \times 350 mm (13-3/4 in. \times 13-3/4 in.) shall be fabricated from Style 3/4 9F expanded and flattened steel sheet complying with the dimensions of ASTM F1267. Grid supports having a cross sectional dimension not greater than 40 mm (1 in.) shall be located at each of the corners of the grid and perpendicular to the grid.

(3) The perforated cylinder shall be placed on top of the grid with one end of the perforated cylinder in contact with the grid. A clean, dry, collection pan for runoff from the test liquid application placed under the grid below the perforated cylinder.

(4) Two quantities of ginned cotton each weighing 50 g \pm 0.5 g (1.75 oz \pm 0.02 oz) shall be prepared.

(5) The bottom half of the perforated cylinder shall be filled with 50 g (1.75 oz) of the ginned cotton.

(6) A volume of 250 mL (8.5 oz) of the test liquid (either water or wetting agent solution) shall be placed in a small container.

(7) A steel rod 35 mm \pm 0.5 mm (1.38 in. \pm 0.02 in.) in diameter and 33 mm \pm 0.5 mm (1.30 in. \pm 0.02 in.) long shall be heated to 593°C \pm 5°C (1100°F \pm 10°F).

(8) When the steel rod has been sufficiently heated, it shall be placed on the ginned cotton in the perforated cylinder.

(9) Immediately following placement of the steel rod, an additional 50 g (1.75 oz) of ginned cotton shall be placed on top of the steel rod in the perforated cylinder and the test liquid (either water or wetting agent solution) poured onto the ginned cotton. Extinguishment, as applicable, shall be noted and recorded.

(10) Within 15 minutes following application of the test liquid, the volume of runoff in the collection pan shall be measured and recorded.

(11) Following completion of the test series, the average runoff with water as the test liquid shall be compared to the average runoff with wetting agent solution as the test liquid.

—(1) Stuff 50 g (1.75 oz) of cotton into the bottom half of the basket.

—(2) Heat a steel rod 35 mm (1-3/8 in.) in diameter and 33 mm (1-5/16 in.) long to 593°C (1100°F).

—(3) Place the rod on the cotton in the basket.

—(4) Immediately insert 50 g (1.75 oz) of cotton into the basket on top of the rod.

—(5) Pour 250 cc of test liquid (water or wetting agent solution) onto the cotton and catch the runoff in a pan placed below the basket.

—(6) Measure and record the volume of runoff.

Substantiation: The proposed revisions include clarification regarding the test procedure to promote consistency, repeatability, and reproducibility.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 6 Negative: 3

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

GEORGE, C.: Plain water is ambiguous. Define plain water or use an appropriate term.

JOHNSON, C.: This test method is not clear. There are terms that need to be described or explained (plain water, grid, preparation of cotton), sentence fragments, multiple uses of the same parenthetical phrase here and there through the text rather than in any sort of order.

This reads like an instruction manual for the test operator. Is this already written up in an ASTM or other standard test method that could be referenced?

While something should be included as this document goes to comment stage, the text in the existing document should be used. This will provide time for committee members or others to correct the short comings of this proposal.

The committee should not be spending a lot of time on revising sections because some members prefer a different style (narrative, list, etc.) for the description.

VANDERSALL, H.: This proposal recommends the use of "plain water" but does not define plain water. Is tap, deionized or distilled water required? Or, on the other hand retain "plain" water for some reason and provide a definition.

18-47 Log #22
(5.3.4.3)

Final Action: Reject

Note: This proposal is reported as a "Reject" as it did not receive the simple majority affirmative vote.

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

5.3.4.3 Wood Fiber Board Penetration Fire Test.

5.3.4.3.1 The ability of wetting agent solutions shall to extinguish wood fiber board fires and exhibit less runoff and weight loss than water shall be determined with solution prepared at the minimum concentration specified for use by the manufacturer according to the procedures detailed in this section when tested in accordance with 5.3.4.3.2 and 5.3.4.3.3.

5.3.4.3.2 Tests shall be conducted three times with plain water as the test liquid and three times with the wetting agent solution as the test liquid prepared at the manufacturer's recommended concentrations. All tests shall be conducted on the same day with fiber insulation board squares prepared from the same fiber insulation board. The runoff and weight loss results of replicate tests shall be averaged.

5.3.4.3.3 Penetration tests—The tests shall be conducted as follows using fiber insulation board and test liquid:

(1) The fiber insulation board having a thickness of 13 mm \pm 10% shall be cut into six squares measuring 305 mm \pm 3 mm \times 305 \pm 3 mm (12 in. \pm 1/8 in. \times 12 in. \pm 1/8 in.), weighed, and the weight recorded.

(2) To accommodate the test fuel, a steel pan having a height of 102 mm \pm 3 mm (4 in. \pm 1/8 in.) and measuring 305 mm \pm 3 mm \times 305 \pm 3 mm (12 in. \pm 1/8 in. \times 12 in. \pm 1/8 in.) shall be placed on a level surface.

(3) To accommodate the fiber insulation board squares, a grid having a height of 152 mm \pm 3 mm (6 in. \pm 1/8 in.) and measuring at least 350 mm \times 350 mm (13-3/4 in. \times 13-3/4 in.) shall be fabricated from Style 3/4 9F expanded and flattened steel sheet complying with the dimensions of ASTM F1267. Grid supports having a cross sectional dimension not greater than 40 mm (1 in.) shall be located at each of the corners of the grid and perpendicular to the grid.

(4) A volume of 250 mL (8.5 oz) of the test liquid (either water or wetting agent solution) shall be placed in a small sprinkler bottle.

(5) The steel pan shall be filled with a sufficient amount of test fuel, commercial grade denatured alcohol, to sustain the required flame exposure duration. The grid shall be placed above the steel pan with the bottom of the grid supports on the same surface as the bottom of the steel test fuel pan. Each fiber insulation board square shall be individually placed on the grid centrally over the steel pan, the denatured alcohol ignited, a timer started, and the fiber insulation board square exposed to the flames.

(6) At 105 seconds of flame exposure, the steel pan is to be removed and replaced with a clean, dry, collection pan for runoff from the test liquid application. Immediately following positioning of the collection pan, the test liquid shall be sprayed on the surface of the fiber insulation board square that has not been exposed to flames and, if applicable, the extinguishment time recorded.

(7) Within 15 minutes following application of the test liquid, the volume of runoff in the collection pan shall be measured and recorded.

(8) Each fiber insulation board square shall then be dried, weighed, the weight recorded, and the weight loss calculated.

(9) Following completion of the test series, the average runoff and average weight loss with water as the test liquid shall be compared to the average runoff and average weight loss with wetting agent solution as the test liquid.

—(1) Weigh fiber insulation board squares measuring 305 mm \times 305 mm \times 13 mm (12 in. \times 12 in. \times 1/2 in.) and place on a wire grid.

—(2) Expose each insulating board sample to an alcohol flame from a burning pan that is placed immediately below the sample board.

—(3) Expose the flame to the board for 1-3/4 minutes (105 seconds).

—(4) Remove the fuel pan and place a clean, dry pan under the board to collect the water or agent runoff.

—(5) Spray 250 mL (8.5 oz) of test liquid (water or wetting agent solution) on the upper surface of the insulation board using a small sprinkler bottle.

—(6) Place pans underneath the board to catch any runoff that occurs.

—(7) Measure and record the volume of runoff.

—(8) Dry and weigh the boards and calculate the weight loss.

Substantiation: The proposed revisions include clarification regarding the test procedure to promote consistency, repeatability, and reproducibility.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 6 Negative: 3

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

GEORGE, C.: Plain water is ambiguous. Define plain water or use an appropriate term.

JOHNSON, C.: Same comments as 28 above for Proposal 18-46 (Log #21).

VANDERSALL, H.: Once again "plain water" is referenced without a definition. Also, the "test liquid" is referenced; test liquid should be replaced with wetting agent solution.

18-48 Log #23
(5.3.5)

Final Action: Accept

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

5.3.5* Class B Fire Extinguishment Tests.

5.3.5.1 Wetting agent solutions at the minimum concentrations specified for use by the manufacturer shall be evaluated to and comply with the requirements of UL 711/ULC S508 for Class B fires.

5.3.5.2 Tests for Class B fires shall be conducted as follows:

- (1) A 4.65 m² (50 ft²) 20 B pan fitted as described in UL 711/ULC S508 with a steel backboard that is approximately the width of the pan and approximately 0.9 m (3 ft) high shall be used.
- (2) A 51 mm (2 in.) layer of heptane fuel shall be floated on a 102 mm (4 in.) depth of water.
- (3) The fuel in the pan shall be ignited and allowed to free burn for 60 seconds.
- (4) A 37.9 L/min (10 gpm) nozzle shall be used to apply the wetting agent solution to the fire using one, or a combination, of the following methods:
 - (a) The nozzle shall be fixed in position at an angle above the horizontal in order to direct the discharge across the pan on to the backboard for the entire duration of the test.
 - (b) The nozzle shall be permitted to be moved as necessary for control and extinguishment.
- (5) In no case shall the nozzle extend over any part of the test pan.
- (6) The fire shall be extinguished within 5 minutes of the start of application of the wetting agent solution.

5.3.5.3 Extinguishment shall be achieved in two consecutive tests.

A.5.3.5 Although wetting agent solutions and Class B foams are required to pass Class B fire performance tests to obtain a listing, the tests are different. Some of the most important differences are as follows:

- (1) The tested application rate for wetting agent solutions is 8.1 L/min · m² (0.2 gpm/ft²) under NFPA 18. The tested application rate Class B foam solutions is 1.6 L/min · m² to 2.4 L/min · m² (0.04 gpm/ft² to 0.06 gpm/ft²) under NFPA 11.
- (2) There are no burnback or sealability requirements for wetting agent solutions.
- (3) There is no published application rate in NFPA 18.

There is limited, if any, experience with the extinguishment of fires in extreme depth such as tank or dike fires.

Substantiation: The proposed revisions permit the use of the minimum concentration solution and specify that the backboard be of steel construction with approximate dimensions as shown. Only approximate dimensions for the backboard are required as the size of the backboard is a function of the spray pattern of the nozzle.

Committee Meeting Action: Accept

Revise text to read as follows:

5.3.5* Class B Fire Extinguishment Tests.

5.3.5.1 Wetting agent solutions at the minimum concentrations specified for use by the manufacturer shall be evaluated to and comply with the requirements of UL 711/ULC S508 for Class B fires.

5.3.5.2 Tests for Class B fires shall be conducted as follows:

- (1) A 4.65 m² (50 ft²) 20 B pan fitted as described in UL 711/ULC S508 with a steel backboard that is approximately the width of the pan and approximately 0.9 m (3 ft) high shall be used.
- (2) A 51 mm (2 in.) layer of heptane fuel shall be floated on a 102 mm (4 in.) depth of water.
- (3) The fuel in the pan shall be ignited and allowed to free burn for 60 seconds.
- (4) A 37.9 L/min (10 gpm) nozzle shall be used to apply the wetting agent solution to the fire using one, or a combination, of the following methods:
 - (a) The nozzle shall be fixed in position at an angle above the horizontal in order to direct the discharge across the pan on to the backboard for the entire duration of the test.
 - (b) The nozzle shall be permitted to be moved as necessary for control and extinguishment.
- (5) In no case shall the nozzle extend over any part of the test pan.
- (6) The fire shall be extinguished within 5 minutes of the start of application of the wetting agent solution.

5.3.5.3 Extinguishment shall be achieved in two consecutive tests.

A.5.3.5 Although wetting agent solutions and Class B foams are required to pass Class B fire performance tests to obtain a listing, the tests are different. Some of the most important differences are as follows:

- (1) The tested application rate for wetting agent solutions is 8.1 L/min · m² (0.2 gpm/ft²) under NFPA 18. The tested application rate Class B foam solutions is 1.6 L/min · m² to 2.4 L/min · m² (0.04 gpm/ft² to 0.06 gpm/ft²) under NFPA 11.
- (2) There are no burnback or sealability requirements for wetting agent solutions.
- (3) There is no published application rate in NFPA 18.

There is limited, if any, experience with the extinguishment of fires in extreme depth such as tank or dike fires.

Committee Statement: Committee chose to maintain the use of “approximately” in this context. No substantiation was provided for the revision of language.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 8 Negative: 1

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

VANDERSALL, H.: The use of approximately in describing the width and height of the backboard is considered inappropriate. I recognize that approximately is used in other Sections of the Standard and those uses are considered appropriate because they could not impact the obtained result. However, in this case, the height of the backboard could be of particular importance. There is no reason that the dimensions of the backboard cannot be precisely specified.

Comment on Affirmative:

JOHNSON, C.: The use of the word approximately does not seem to be appropriate in a test method that goes in to so much detail.

What is the difference between the text of the original proposal and the committee revision? There does not seem to be any difference and the original action was to accept.

18-49 Log #32

(6.1)

Final Action: Accept

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

Chapter 6 Requirements for Supply of Wetting Agent

6.1 System Requirements.

6.1.1* Equipment. Wetting agent concentrate agents that complies comply with this standard shall be permitted for use with standard equipment provided said equipment is primarily designed to utilize water or foam as a medium of fire control and extinguishment.

A.6.1.1 The method whereby the wetting agent concentrate is added to water is not herein specified, specifically set forth. The solution can be premixed in tanks or can result from bringing the wetting agent concentrate into contact with water by any suitable proportioning device, provided providing said device is approved in accordance with applicable standards.

Substantiation: The proposed revisions provide clarification and consistency between NFPA 18 and NFPA 18A and correct typographical errors.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 7 Negative: 2

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: Wetting Agent needs to remain in the title. The term “supply” by itself is either meaningless or has too many meanings to be of any use.

Since the committee was scheduled to revise 18A during the same meeting the substantiation is pretty weak. Since the committee now has additional time to look at 18A, we should be focusing on doing the best we can to make the standards helpful to the user. We can then go forward and revise 18A to match new revisions to 18 where it is appropriate.

VANDERSALL, H.: Removal of Wetting Agent in the title of the Section is inappropriate. If wetting agent is retained the addition of concentrate throughout the text is un-necessary.

18-50 Log #26

(6.2)

Final Action: Accept

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

6.2 Fire Department Supply Requirements.

6.2.1 Tanks. ~~6.2.1.1~~ The manufacturer of the wetting agent concentrate shall specify if premixing is allowed.

6.2.2* Separate Supplies. Where portable tanks are not a part of the apparatus, or where it is desired to carry the wetting agent concentrate separately for use either with water from portable tanks or with water from other sources of supply, the amount of concentrate considered necessary shall be carried in a tank connected to proportioning equipment on the apparatus installed in accordance with NFPA 1901.

A.6.2.2 Where such equipment is also used to take suction from a hydrant supplied by potable water, extra care should be exercised to prevent contamination of such potable water supplies with the wetting agent concentrate or solution.

Substantiation: The proposed revisions provide clarification and consistency between NFPA 18 and NFPA 18A.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 8 Negative: 1

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

VANDERSALL, H.: See my Explanation of Negative on Proposal 18-11 (Log #CP13).

Comment on Affirmative:

JOHNSON, C.: I see no specific problems with this proposal but would like to reiterate the comment made above with regard to Proposal 18-49 (Log #32) and aligning 18 with 18A.

18-51 Log #CP8

(6.2.2* Separate Supplies)

Final Action: Accept in Principle

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise text as follows:

6.2.2* Separate Supplies. Where portable tanks are not a part of the apparatus, or where it is desired to carry the wetting agent separately for use either with water from portable tanks or with water from other sources of supply, the concentrate shall be carried in a tank, connected to proportioning equipment on the apparatus installed in accordance with NFPA 1901, and/or in the manufacturer’s original container.

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.

Committee Meeting Action: Accept in Principle

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-52 Log #CP3

Final Action: Accept

(6.3* Fixed Systems)

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise text as follows:

6.3* Fixed Systems.

Fixed systems utilizing wetting agent solution shall be permitted to be installed in accordance with one of the following standards only after an engineering analysis acceptable to the authority having jurisdiction has been conducted:

- (1) NFPA 13
- (2) NFPA 14
- (3) NFPA 15

Substantiation: Removes unenforceable language as per the NFPA Manual of Style.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-53 Log #25

Final Action: Accept

(6.3)

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

6.3* Fixed Systems. Fixed systems utilizing wetting agent solution shall be permitted to be installed in accordance with the following standards as appropriate only after an engineering analysis acceptable to the authority having jurisdiction has been conducted:

- (1) NFPA 13
- (2) NFPA 14
- (3) NFPA 15

A.6.3 In such installations consideration should be given primarily to limitations outlined in Chapter 4 and to the following:

(1) ~~The possibility~~ Possibility of increased water damage due to the ~~potentially~~ high absorption ability of the wetting agent solution

(2) ~~The possibility~~ Possibility of increased floor loads due to the ~~potential~~ retention of large volumes of wetting agent solution

(3) ~~The potential~~ Potential for contaminating the public water supply when supplying a fixed system through the fire department connection

If, during pre-incident planning, supplying a fixed system with a wetting agent solution is considered, an engineering evaluation should be conducted.

Substantiation: The proposed revisions provide clarification and consistency between NFPA 18 and NFPA 18A.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-54 Log #31

Final Action: Accept

(7.1)

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

7.1 Packaging.

7.1.1* Regulations. Packaging of wetting agent ~~water additive~~ concentrates shall conform ~~to with~~ regulations governing ground and air transport of materials.

7.1.2 Containers-Test. Containers shall comply with the construction requirements of UL 162 Section 5.2.1 and nonmetallic containers shall comply with the accelerated storage test in UL 162 Section 22.3 using the wetting agent.

A.7.1.1 Wetting agent concentrate ~~Water additive~~ containers should conform to the United Nations Performance Based Packaging Standards as codified under U.S. Department of Transportation Regulations, 49 CFR 178.600.4.

Substantiation: The proposed revisions correct typographical errors and provide clarification regarding container evaluation in accordance with UL 162 while maintaining consistency between NFPA 18 and NFPA 18A. UL 162 Section 22.3 includes reference that the test is to be conducted with concentrate. UL 162 Section 5.2.1 is included below for reference.

5.2.1 A container for liquid concentrate shall be of not less than 1 gallon (3.8 L) capacity and shall be equivalent in durability, strength, and corrosion resistance to a container constructed of steel not less than 0.0209 inch (0.56 mm) thick. A container shall be fitted with a tamper seal or use indicator and shall be provided with a pour opening having an inside diameter not less than 1-1/2 inches (38.1 mm).

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-55 Log #30

Final Action: Accept

(7.2)

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

7.2 Storage.

7.2.1 Facilities for storing the concentrate and premix solutions in accordance with the recommendations of the manufacturer shall be provided.

7.2.2 ~~No wetting~~ Wetting agent concentrate shall ~~not~~ be stored at a temperature below 0°C (32°F) or above 49°C (120°F).**4.**

Substantiation: The proposed revisions provide consistency between NFPA 18 and NFPA 18A, as well as, define the maximum storage temperature. The maximum storage temperature is consistent with the maximum intended exposure temperature of the concentrate for separation, viscosity, and corrosion tests.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-56 Log #28

Final Action: Reject

(7.3)

Note: This proposal is reported as a “Reject” as it did not receive the simple majority affirmative vote.

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

7.3 Labeling. The manufacturer shall provide the following information on a label permanently attached to the concentrate container:

- (1) Manufacturer name and address
- (2) Product name, lot number, and date of manufacture
- (3) Manufacturer’s ~~recommended proportioning ratios~~ listed concentrations for each listed application

(4) Application rate for each listed application

(5) Recommended minimum and maximum storage temperatures

(6) Suitability for premixing

(7) Emergency and first aid instructions

(8) Volume of concentrate wetting agent ~~in the container~~

(9) Listing agency mark

Substantiation: The proposed revisions provide consistency, as applicable, between NFPA 18 and NFPA 18A.

Committee Meeting Action: Accept in Part

Revise text to read as follows:

7.3 Labeling. The manufacturer shall provide the following information on a label permanently attached to the concentrate container:

- (1) Manufacturer name and address
- (2) Product name, lot number, and date of manufacture
- (3) Listed proportioning ratio(s) for each listed application
- (4) Recommended minimum and maximum storage temperatures
- (5) Suitability for premixing
- (6) Emergency and first aid instructions
- (7) Volume of wetting agent concentrate in the container
- (8) Listing agency mark

Committee Statement: Rewording of section meets the submitter’s intent.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 6 Negative: 3

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

GEORGE, C.: Eliminate recommended mix ratios and allow only those tested and listed ratios or ranges.

JOHNSON, C.: The manufacturer must provide the information developed during the listing tests. Without this section, the manufacturer could recommend some other concentration or concentration range, and the user would not realize they were using an unlisted, and potentially ineffective, concentration of a listed product.

VANDERSALL, H.: Section 7.3 (3) changed the need for the manufacturer to provide the listed concentrations to the recommended proportioning ratios. The manufacturer should not be allowed to recommend concentrations outside of the range of concentrations that have been tested and listed. Also, the un-necessary inclusion of concentrate occurs.

18-57 Log #27

Final Action: Accept in Principle

(8.1)

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

8.1* Fixed Extinguishing Systems. Fixed extinguishing systems referenced in Section 6.3 shall be inspected, tested, and maintained in accordance with the applicable system requirements of NFPA 25.

A.8.1 Due to its potentially greater penetrating power, wetting agent solution is capable of passing through small openings that would be impassable to water. For this reason it will often be found that old, but apparently sound, equipment will have a tendency to leak when charged with wetting agent solution, especially at worn packing glands. Packing glands, retainers, bushings, threaded joints, and screw unions should be inspected and replaced as necessary, and regular inspections should be held thereafter.

Substantiation: The proposed revision provide clarification and consistency between NFPA 18 and NFPA 18A, as well as, addresses the potential of these solutions being used for protection of commercial cooking equipment as referenced in Section 4.2 which would require inspection, testing, and maintenance in accordance with NFPA 17A.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

8.1* Fixed Extinguishing Systems. Fixed extinguishing systems referenced in Section 6.3 shall be inspected, tested, and maintained in accordance with the applicable system requirements of NFPA 25.

A.8.1 Due to its greater penetrating power, wetting agent solution is capable of passing through small openings that would be impassable to water. For this reason it will often be found that old, but apparently sound, equipment will have a tendency to leak when charged with wetting agent solution, especially at worn packing glands. Packing glands, retainers, bushings, threaded joints, and screw unions should be inspected and replaced as necessary, and regular inspections should be held thereafter.

Committee Statement: Committee feels that wetting agents have a greater penetration, having the word potentially is redundant.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Comment on Affirmative:

JOHNSON, C.: Same comment regarding try to match 18 to 18A when 18A is scheduled for revision in next cycle. Do what makes sense and the committee can then match 18A to 18 if necessary.

18-58 Log #29
(8.2)

Final Action: Accept

Submitter: Blake M. Shugarman, Underwriters Laboratories Inc.

Recommendation: 8.2 Inspection of Wetting Agent Concentrate. Annually, samples of wetting agent concentrate agents shall be sent to the manufacturer or qualified laboratory for quality condition testing.

Substantiation: The proposed revision provides clarification and consistency between NFPA 18 and NFPA 18A.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 8 Negative: 1

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

VANDERSALL, H.: See my Explanation of Negative on Proposal 18-11 (Log #CP13).

Comment on Affirmative:

JOHNSON, C.: Same comment regarding try to match 18 to 18A when 18A is scheduled for revision in next cycle. Do what makes sense and the committee can then match 18A to 18 if necessary.

18-59 Log #CP19
(A.4.3)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Reword existing Annex material as follows:

4.3* Compatibility of Wetting Agent Concentrate and Solutions

A.4.3 Different wetting agent concentrates and their solutions may be incompatible. Such incompatibilities may result in any or all of, but not be limited to the following conditions:

- Loss of fire fighting performance
- Coagulation and/or jelling of the concentrate or solution which may alter flow.
- Improper proportioning rates.
- Increased corrosion or other structural damage.
- Inability to maintain a stable solution

Provided that the blending and application of water agent and water additive solutions is conducted using separate delivery equipment (to avoid the potential conditions noted above), it may be beneficial to apply more than one type of wetting agent and/or water additive solution (including conventional foam solutions as governed by NFPA 11 and NFPA 1150) to take advantage of different product features and benefits.

It may be beneficial to use two or more different technologies to suppress a fire. For example apply a wetting agent solution on a 3-dimensional fuel fire to achieve suppression and then apply a conventional Class B foam blanket to provide an extra margin of safety and additional exposure protection for the resulting pooled fuel collected underneath the 3-dimensional object.

Every care should be taken to avoid applying divergent technologies together,

directed at the same delivery point or target to avoid one product interfering with another, rendering one or both less effective.

Substantiation: The Committee wanted to allow the user of the document to consider applying different types of agents covered by different NFPA Standards to achieve different objectives in conjunction with wetting agents covered by this Standard.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Comment on Affirmative:

JOHNSON, C.: Revisit my Explanation of Negative on 18-11 (Log #CP13). with regard to naming of the products and solutions covered by this standard.

VANDERSALL, H.: Need to remove the un-necessary word “concentrate”. Otherwise the additional information is worthwhile retaining.

18-60 Log #CP20
(A.5.2.4.1)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Insert new Annex material as follows:

A.5.2.4.1. There can be significant variation between surface tension results obtained from different tensiometers or different operators. This is especially true with older style manual equipment, when there are different operators, or long periods of time between measurements. To minimize the impact of variation on the results of the comparative tests, scheduling an evaluation so that the surface tensions to be compared can be measured by the same operator, on the same equipment is best. When this is not possible, measurements of known fluids such as water can be used to assess the amount of variation. The results of the surface tension measurements on the control fluid should be recorded with the results of the test product.

Substantiation: Committee feels this provides clarification of the issue which may affect the usefulness of the results.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

18-61 Log #CP26
(A.7.1.1)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise as follows:

A.7.1.1 Water additive containers should conform to the United Nations Performance Based Packaging Standards as codified under U.S. Department of Transportation Regulations, 49 CFR 178, Subpart M.

Substantiation: Provides clarification for the user as to the types of containers required.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 7 Negative: 2

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: This standard applies to wetting agents not to water additives. The text should support this.

VANDERSALL, H.: The first sentence needs to be changed from water additive containers to wetting agent containers.

Comment on Affirmative:

SHUGARMAN, B.: The words “Water additive” should be revised to “Wetting agent”.

18-62 Log #CP27
(B.1)

Final Action: Accept

Submitter: Technical Committee on Water Additives for Fire Control and Vapor Mitigation,

Recommendation: Revise as follows:

B.1 Referenced Publications. The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

B.1.1 NFPA Publication. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 11, Standard for Low-, Medium-, and High-Expansion Foam, 2005 edition.

B.1.2 Other Publications.

B.1.2.1 ISO Publication. International Organization for Standardization, 1 rue de Varembe, Case postale 56, CH-1211 Geneva 20, Switzerland.

ISO/IEC 17025, General Requirements for the Competence of Testing and Calibration Laboratories, 2005.

B.1.2.2 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 300, Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment, 2005.

UL 711/ULC S508, Rating and Testing of Fire Extinguishers, 2004, revised 2007.

B.1.2.3 U.S. Government Publication. U.S. Government Printing Office, Washington, DC 20402.

Title 40, Code of Federal Regulations, Part 160, “Good Laboratory Practice Standards,” 2007.

Title 40, Code of Federal Regulations, Part 792, “Good Laboratory Practice Standards,” 2007.

Title 49, Code of Federal Regulations, Part 178, Subpart M, “Testing of Non-bulk Packagings and Packages,” 2007.

Substantiation: Updates the referenced publications for consistency.

Committee Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 8 Negative: 1

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.

Explanation of Negative:

JOHNSON, C.: The information in B.1.2.3. should be listed in Chapter 2 as the cited texts should be listed in Chapter 5.1 to provide firm support for the AHJ.

18-63 Log #2

Final Action: Accept in Principle

(B.1.2.1)

Submitter: Bob Eugene, Underwriters Laboratories Inc.

Recommendation: Revise text as follows:

B.1.2.1 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 300, Standard for Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas, ~~1996~~ 2005.

UL 711, Rating and Testing of Fire Extinguishers, ~~2004~~ 2007.

Substantiation: Updated referenced standards to include the most recent revisions.

Committee Meeting Action: Accept in Principle

Revise text as follows:

B.1.2.1 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 300, Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment 2005.

UL 711/ULC S508, Rating and Testing of Fire Extinguishers, 2004, Revised 2007.

Committee Statement: Changes meet submitter’s intent.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9

Ballot Not Returned: 4 Caron, P., Hanauska, C., Tinsley, Jr., R., Wright, J.