Public Input No. 112-NFPA 10-2023 [Global Input]

CI # 51 - Proposed new definitions:

3.3.10.1 Electronic Remote Monitoring: The use of data-based communication between an installed fire extinguisher and an electronic monitoring system.

By definition this term relates to data being passed to or from an extinguisher and the monitoring system. The performance and requirements for this type of arrangement is contained in the body of the code. The definition should be broad enough to encompass the possibility of both wired and wireless / RF based systems. The key is that this type of monitoring uses data and not just voltage via an open/closed circuit configuration.

The term 'in-place' is probably not the best since an extinguisher is not necessarily in place which is why the monitoring system would detect an extinguisher which was removed from its mounting location and initiate a signal. The system therefore works with both in-place and removed extinguishers - hence the term 'installed' is better. Once an extinguisher is installed and its electronic monitoring is connected all required conditions are annunciated.

3.3.10.2 Electric Extinguisher Signaling Device: An attachment or component which locally indicates the status of an installed fire extinguisher or its cabinet and is not part of an interconnected monitoring system.

NEW TERM Electronic Recordkeeping: A means by which records of extinguisher inspection, testing, and maintenance events are maintained without hard-copy or paper documents. This may be used in a standalone manner or in conjunction with electronic remote monitoring so long as the recorded activity can be produced and disseminated in a format viewable to other parties.

Additional Proposed Changes

File Name	Description	Approved
10_PC18.pdf	10_PC18	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as “Reject but Hold” in Public Comment No. 18 of the (A2021) Second Draft Report for NFPA 10 and per the Regs. at 4.4.8.3.1.

Distinguish between system connected monitoring and standalone singe station devices. Also adds term for Electronic Recordkeeping to make clear the difference between electronic monitoring versus having electronic records. Electronic records may be captured in the field using computerized electronics or they can be paper based which are then archived or scanned into electronic records (PDF's) and this would suffice for recordkeeping under NFPA 10 but would not be considered 'electronic monitoring' for purposes of reducing inspection intervals or tasks required by the Code.

Submitter Information Verification

Submitter Full Name: TC ON PFE-AAA
Organization: NFPA TC ON Portable Fire Extinguishers
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 22 13:49:17 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The proposed terms are not used within NFPA 10 and can therefore not be adopted in Chapter 3.

Public Comment No. 18-NFPA 10-2020 [Global Input]

CI # 51 - Proposed new definitions:

3.3.10.1 Electronic Remote Monitoring: The use of data-based communication between an installed fire extinguisher and an electronic monitoring system.

By definition this term relates to data being passed to or from an extinguisher and the monitoring system. The performance and requirements for this type of arrangement is contained in the body of the code. The definition should be broad enough to encompass the possibility of both wired and wireless / RF based systems. The key is that this type of monitoring uses data and not just voltage via an open/closed circuit configuration.

The term 'in-place' is probably not the best since an extinguisher is not necessarily in place which is why the monitoring system would detect an extinguisher which was removed from its mounting location and initiate a signal. The system therefore works with both in-place and removed extinguishers - hence the term 'installed' is better. Once an extinguisher is installed and its electronic monitoring is connected all required conditions are annunciated.

3.3.10.2 Electric Extinguisher Signaling Device: An attachment or component which locally indicates the status of an installed fire extinguisher or its cabinet and is not part of an interconnected monitoring system.

NEW TERM Electronic Recordkeeping: A means by which records of extinguisher inspection, testing, and maintenance events are maintained without hard-copy or paper documents. This may be used in a standalone manner or in conjunction with electronic remote monitoring so long as the recorded activity can be produced and disseminated in a format viewable to other parties.

Statement of Problem and Substantiation for Public Comment

Distinguish between system connected monitoring and standalone singe station devices. Also adds term for Electronic Recordkeeping to make clear the difference between electronic monitoring versus having electronic records. Electronic records may be captured in the field using computerized electronics or they can be paper based which are then archived or scanned into electronic records (PDF's) and this would suffice for recordkeeping under NFPA 10 but would not be considered 'electronic monitoring' for purposes of reducing inspection intervals or tasks required by the Code.

Related Item

• PI #51

Submitter Information Verification

Submitter Full Name: David Phelan
Organization: NFPA 10 Committee
Affiliation: Not Representing any Entity or Client
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 02 13:35:32 EDT 2020

Committee:

Committee Statement

Committee Action: Rejected but held

Resolution: The comment is new material.

Public Input No. 113-NFPA 10-2023 [Global Input]

With regard to NFPA 10's document structure and contents of Chapter 6 (Installation) and Chapter 7 (Inspection, Maintenance, and Recharging) and as part of the following FR's which were not afforded adequate opportunity for committee discussion at the first meeting. (FR #'s 9 10, 11, 16, 53, 59, & 64)

The concept of the document structure is that whenever a new fire extinguisher, or a replacement fire extinguisher, is initially installed all applicable requirements of Chapter 6 are appled and enforceable. Thereafter, and until such time as that fire extinguisher is replaced, Chapter 6 would not be citable and anything found or perceived as deficient would have to be cited through Chapter 7.

That structure therefore requires that anything in Chapter 6 relating to an installation requirement must have companion language in Chapter 7 which requires the ongoing inspection and maintenance of those installation requirements. If not then we get a compliant installation which is not enforceable over the life of the installation and once it falls out of installation compliance there is little that can be done or cited without getting creative and going back to Chapter 6.

It is clearly within the Scope of NFPA 10 to regulate the installation of extinguishers but ALSO the maintenance requirements (Chapter 6) (See 1.1 & 1.1.1) but at present Chapter 7 is almost exclusively focused on the physical being of the extinguisher and therefore is overlooking a large component of 'proper extinguishers' which include their identification, access, conspicuity mounting, and when problems are actionable other than during the prescribed maintenance intervals. Because of the persistence of this problem the field use of the Code often reverts to Chapter 6 to 'shore up' field inspections found by code authorities who are performing site inspections and not a prescribed owners monthly inspection. It's not a legitimate approach to extinguisher maintenance and this Committee needs to continue its charge of producing a comprehensive and inclusive code document.

At present there is disparity between Chapter 6 and 7 as follows: (2018 edition and not considering any current proposals)

6.1.2 Extinguisher Readiness is most likely a maintenance requirement but it has a place in both chapters 6 and 7. Its language is key in that located and operationally ready is required at all times.... not just something which is reviewed during a monthly inspection (current Chapter 7 language).

6.1.3.1 No specific language in Chapter 7 and only reviewed during a monthly inspection. It needs standalone section to be actionable immediately upon discovery.

6.1.3.3 - 6.1.3.3.4 No specific language in Chapter 7 to address supplemental signage maintenance.

6.1.3.4.1-6.1.3.7 No specific language in Chapter 7 to address bracket condition, function, suitability, or damage either during an inspection or upon discovery.

6.1.3.8.3 If I take an existing extinguisher out of the bracket and sit it on the floor right below the bracket to block a door open where in Chapter 7 is this citable on discovery?

6.1.3.9 At present there is no requirement that extinguishers be kept or left with their operating labels facing outward after installation except during a monthly inspection in certain high risk locations (See 7.2.2.4 #1 which is only triggered by 7.2.2.3)

6.1.3.10 Chapter 6 tells us all about cabinets and then nothing in chapter 7 at all. Yes there is some minor language pending but it needs to mirror all of 6.1.3.10's points.

At present there is no language in the document which could be used to restart the extinguisher hazard analysis and selection process if an existing occupancy or installation undergoes some change that renders a previously installed fire extinguisher an incorrect choice, size, rating, location, or travel distance. Buildings often undergo physical changes that reconfigure the interior spaces and that can leave previously installed extinguishers now incorrectly located or out of travel distance rules. This is a common field problem but there is no on-point language in NFPA 10 which addresses such changes in the building or occupancy. If these changed conditions are found by a code official or a service provider performing inspection services they would be hard pressed to be able to open the document and point to a code section which would essentially force a restart of the process of evaluating hazard against current extinguisher. It would most likely need to be located somewhere in Chapter 7 right up front like a new section 7.1.5:

'Where building conditions or occupancy changes may impact currently installed fire extinguisher rating, size, placement, travel distances, or mounting an evaluation shall be performed by an individual or entity acceptable to the authority having jurisdiction to determine ongoing compliance with Chapter 5 and Annex C. Where instances of noncompliance are found corrective action shall be performed.'

Additional Proposed Changes

File Name	Description	Approved
10_PC19.pdf	10_PC19	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as “Reject but Hold” in Public Comment No. 19 of the (A2021) Second Draft Report for NFPA 10 and per the Regs. at 4.4.8.3.1.

The Committee has to ensure that what is required on installation from Chapter 6 can be tied to a maintenance requirement thereafter in Chapter 7.

Submitter Information Verification

Submitter Full Name: TC ON PFE-AAA
Organization: NFPA TC ON Portable Fire Extinguishers
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 22 13:52:21 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: There is no specific technical revision proposed in the Public Input that the committee can act upon.

Public Comment No. 19-NFPA 10-2020 [Global Input]

With regard to NFPA 10's document structure and contents of Chapter 6 (Installation) and Chapter 7 (Inspection, Maintenance, and Recharging) and as part of the following FR's which were not afforded adequate opportunity for committee discussion at the first meeting. (FR #'s 9 10, 11, 16, 53, 59, & 64)

The concept of the document structure is that whenever a new fire extinguisher, or a replacement fire extinguisher, is initially installed all applicable requirements of Chapter 6 are appled and enforceable. Thereafter, and until such time as that fire extinguisher is replaced, Chapter 6 would not be citable and anything found or perceived as deficient would have to be cited through Chapter 7.

That structure therefore requires that anything in Chapter 6 relating to an installation requirement must have companion language in Chapter 7 which requires the ongoing inspection and maintenance of those installation requirements. If not then we get a compliant installation which is not enforceable over the life of the installation and once it falls out of installation compliance there is little that can be done or cited without getting creative and going back to Chapter 6.

It is clearly within the Scope of NFPA 10 to regulate the installation of extinguishers but *ALSO* the maintenance requirements (Chapter 6) (See 1.1 & 1.1.1) but at present Chapter 7 is almost exclusively focused on the physical being of the extinguisher and therefore is overlooking a large component of 'proper extinguishers' which include their identification, access, conspicuity mounting, and when problems are actionable other than during the prescribed maintenance intervals. Because of the persistence of this problem the field use of the Code often reverts to Chapter 6 to 'shore up' field inspections found by code authorities who are performing site inspections and not a prescribed owners monthly inspection. It's not a legitimate approach to extinguisher maintenance and this Committee needs to continue its charge of producing a comprehensive and inclusive code document.

At present there is disparity between Chapter 6 and 7 as follows: (2018 edition and not considering any current proposals)

6.1.2 Extinguisher Readiness is most likely a maintenance requirement but it has a place in both chapters 6 and 7. Its language is key in that located and operationally ready is required at all times.... not just something which is reviewed during a monthly inspection (current Chapter 7 language).

6.1.3.1 No specific language in Chapter 7 and only reviewed during a monthly inspection. It needs standalone section to be actionable immediately upon discovery.

6.1.3.3 - 6.1.3.3.4 No specific language in Chapter 7 to address supplemental signage maintenance.

6.1.3.4.1-6.1.3.7 No specific language in Chapter 7 to address bracket condition, function, suitability, or damage either during an inspection or upon discovery.

6.1.3.8.3 If I take an existing extinguisher out of the bracket and sit it on the floor right below the bracket to block a door open where in Chapter 7 is this citable on discovery?

6.1.3.9 At present there is no requirement that extinguishers be kept or left with their operating labels facing outward after installation except during a monthly inspection in certain high risk locations (See 7.2.2.4 #1 which is only triggered by 7.2.2.3)

6.1.3.10 Chapter 6 tells us all about cabinets and then nothing in chapter 7 at all. Yes there is some minor language pending but it needs to mirror all of 6.1.3.10's points.

At present there is no language in the document which could be used to restart the extinguisher hazard analysis and selection process if an existing occupancy or installation undergoes some change that renders a previously installed fire extinguisher

an incorrect choice, size, rating, location, or travel distance. Buildings often undergo physical changes that reconfigure the interior spaces and that can leave previously installed extinguishers now incorrectly located or out of travel distance rules. This is a common field problem but there is no on-point language in NFPA 10 which addresses such changes in the building or occupancy. If these changed conditions are found by a code official or a service provider performing inspection services they would be hard pressed to be able to open the document and point to a code section which would essentially force a restart of the process of evaluating hazard against current extinguisher. It would most likely need to be located somewhere in Chapter 7 right up front like a new section 7.1.5:

'Where building conditions or occupancy changes may impact currently installed fire extinguisher rating, size, placement, travel distances, or mounting an evaluation shall be performed by an individual or entity acceptable to the authority having jurisdiction to determine ongoing compliance with Chapter 5 and Annex C. Where instances of non-compliance are found corrective action shall be performed.'

Statement of Problem and Substantiation for Public Comment

The Committee has to ensure that what is required on installation from Chapter 6 can be tied to a maintenance requirement thereafter in Chapter 7.

Related Item

• FR # 9 • FR # 10 • FR # 11 • FR # 16 • FR # 53 • FR # 59 • FR # 64

Submitter Information Verification

Submitter Full Name: David Phelan
Organization: NFPA 10 Committee Member
Affiliation: Not Representing any Entity or Client
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 03 08:19:22 EDT 2020
Committee:

Committee Statement

Committee Action: Rejected but held
Resolution: The public comment is new material and is being held for the next revision cycle.

Public Input No. 200-NFPA 10-2023 [Global Input]

Remove “Standard for” from all UL, CAN/ULC standard titles.

Statement of Problem and Substantiation for Public Input

The term “Standard for” is redundant and unnecessary. All references to UL publications are standards.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 201-NFPA 10-2023 [Section No. 2.3.4]	
Public Input No. 202-NFPA 10-2023 [Section No. 2.3.6]	
Public Input No. 203-NFPA 10-2023 [Section No. K.1.2.4]	
Public Input No. 204-NFPA 10-2023 [Section No. K.1.2.5]	
Public Input No. 205-NFPA 10-2023 [Section No. K.1.2.6]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 01 08:23:01 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-45-NFPA 10-2023
Statement: Publication references and organization addresses have been updated to be current. "Standard for" has been removed from all UL references as proposed in the public inputs.

Public Input No. 21-NFPA 10-2022 [Global Input]

Public Inputs 19 & 20 relating to Sections 5.5.5.1's list of some 70 other NFPA codes and standards identifies 4 cross references which are ineffective and provide no usable guidance to a user of either NFPA 10 or those other cross referenced standards. There is a good possibility that more of the remaining 66 cross referenced standards also contain obsolete or circular cross referencing back to NFPA 10. In the interest to keeping NFPA 10 up to date and the prevailing global standard for portable fire extinguishers a Task Group should be convened to review all 70 currently referenced standards to ensure those references remain accurate, valid, and technically correct. If the cross referenced standard only provides a circular reference back to NFPA 10 then that indicates that NFPA 10 should consider developing and adding specific PFE requirements directly into NFPA 10 so the ultimate goal of providing guidance to users is achieved.

Statement of Problem and Substantiation for Public Input

There is a good possibility that more of the remaining 66 cross referenced standards also contain obsolete or circular cross referencing back to NFPA 10. In the interest to keeping NFPA 10 up to date and the prevailing global standard for portable fire extinguishers a Task Group should be convened to review all 70 currently referenced standards to ensure those references remain accurate, valid, and technically correct. If the cross referenced standard only provides a circular reference back to NFPA 10 then that indicates that NFPA 10 should consider developing and adding specific PFE requirements directly into NFPA 10 so the ultimate goal of providing guidance to users is achieved.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 19-NFPA 10-2022 [Section No. 5.5.5.1]	Probable Cause for Further Investigation of Entire List in 5.5.5.1
Public Input No. 20-NFPA 10-2022 [Section No. 5.5.5.1]	Probable Cause for Further Investigation of Entire List in 5.5.5.1

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing any Group, Organization, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Fri May 20 09:29:42 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: CI-41-NFPA 10-2023

Statement: A task group has been developed to review references to other NFPA documents, within NFPA 10. The work of this task group will be reviewed at the Second Draft meeting.

Public Input No. 73-NFPA 10-2023 [Section No. 1.1 [Excluding any Sub-Sections]]

The provisions of this standard apply to the selection, installation, inspection, maintenance, recharging, and testing of portable fire extinguishers and Class D extinguishing agents. This standard does not cover lithium and other technology batteries.

Statement of Problem and Substantiation for Public Input

Currently there are no listings for fire extinguisher or UL test standard, but you will see companies that say that their product can be used a fire Lithium and other technologies batteries.

The big question is what class of fire is a lithium battery event? We know there may be some DC electric charge on the unit, we may have toxic, flammable/combustible gases released during an event where a battery is damaged or abused. Some folks may even say that it is a combustible metal fire.

By making a new class we can educate all parties on the true hazards of these types of batteries, the class of fire and develop ne UL standards for extinguisher that are used on their batteries.

I understand that I may be missing some data and other code section, but I develop the committee should review the issue related to fire extinguisher use on battery fires and determine the correct testing, listing and location to protect this hazard.

We know the hazard is real at single family homes, apartments, offices, business, and other occupancies.

There has been multiple reports of these types of fires that resulted in injuries and even deaths.

I would recommend that the committee have a working group to determine what is best for this type of event, to determine a new class of fire or exclude portable fire extinguisher from the scope of work for lithium and other technologies batteries.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 69-NFPA 10-2023 [New Section after 5.2.5]	same subject

Submitter Information Verification

Submitter Full Name: Joe McElvaney
Organization: The Hiller Companies
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 12 14:57:33 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: This standard addresses fire extinguishers and the appropriate type of extinguishing agent. There is not sufficient testing to determine what, if any, extinguishing agent is appropriate or not appropriate for batteries. Battery chemistry is constantly changing and the general statement that this standard does not apply to lithium or other batteries is not appropriate. The phrase “other technology batteries” is too broad as it doesn’t indicate what technology.

Public Input No. 59-NFPA 10-2023 [Section No. 2.2]

2.2 NFPA Publications.

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

NFPA 1, *Fire Code* , 2021 edition.

NFPA 2, *Hydrogen Technologies Code* , 2020 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems,* 2019 edition.

NFPA 18A, Standard on Water Additives for Fire Control and Vapor Mitigation, 2022 Edition

NFPA 22, *Standard for Water Tanks for Private Fire Protection,* 2018 edition.

NFPA 30, *Flammable and Combustible Liquids Code,* 2021 edition.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages,* 2021 edition.

NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials,* 2021 edition.

NFPA 40, *Standard for the Storage and Handling of Cellulose Nitrate Film,* 2022 edition.

NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals,* 2019 edition.

NFPA 51, *Standard for the Design and Installation of Oxygen–Fuel Gas Systems for Welding, Cutting, and Allied Processes,* 2018 edition.

NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work,* 2019 edition.

NFPA 52, *Vehicular Natural Gas Fuel Systems Code,* 2019 edition.

NFPA 58, *Liquefied Petroleum Gas Code,* 2020 edition.

NFPA 59, *Utility LP-Gas Plant Code,* 2021 edition.

NFPA 59A, *Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG),* 2019 edition.

NFPA 72®, National Fire Alarm and Signaling Code®, 2022 edition.

NFPA 75, *Standard for the Fire Protection of Information Technology Equipment,* 2020 edition.

NFPA 76, *Standard for the Fire Protection of Telecommunications Facilities,* 2020 edition.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations,* 2021 edition.

NFPA 99, *Health Care Facilities Code,* 2021 edition.

NFPA 99B, *Standard for Hypobaric Facilities,* 2021 edition.

NFPA *101®, Life Safety Code®,* 2021 edition.

NFPA 102, *Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures,* 2021 edition.

NFPA 115, *Standard for Laser Fire Protection,* 2020 edition.

NFPA 120, *Standard for Fire Prevention and Control in Coal Mines,* 2020 edition.

NFPA 122, *Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities,* 2020 edition.

NFPA 130, *Standard for Fixed Guideway Transit and Passenger Rail Systems,* 2020 edition.

NFPA 140, *Standard on Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Locations,* 2018 edition.

NFPA 150, *Fire and Life Safety in Animal Housing Facilities,* 2022 edition.

NFPA 160, *Standard for the Use of Flame Effects Before an Audience,* 2021 edition.

NFPA 232, *Standard for the Protection of Records,* 2022 edition.

NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations,* 2022 edition.

NFPA 301, *Code for Safety to Life from Fire on Merchant Vessels,* 2018 edition.

NFPA 302, *Fire Protection Standard for Pleasure and Commercial Motor Craft,* 2020 edition.

NFPA 303, *Fire Protection Standard for Marinas and Boatyards,* 2021 edition.

NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves,* 2021 edition.

NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair,* 2020 edition.

NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids,* 2017 edition.

NFPA 400, *Hazardous Materials Code,* 2022 edition.

NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports,* 2018 edition.

NFPA 407, *Standard for Aircraft Fuel Servicing,* 2022 edition.

NFPA 408, *Standard for Aircraft Hand Portable Fire Extinguishers,* 2017 edition.

NFPA 409, *Standard on Aircraft Hangars,* 2021 edition.

NFPA 410, *Standard on Aircraft Maintenance,* 2020 edition.

NFPA 418, *Standard for Heliports,* 2021 edition.

NFPA 423, *Standard for Construction and Protection of Aircraft Engine Test Facilities,* 2021 edition.

NFPA 484, *Standard for Combustible Metals,* 2022 edition.

NFPA 495, *Explosive Materials Code,* 2018 edition.

NFPA 498, *Standard for Safe Havens and Interchange Lots for Vehicles Transporting Explosives,* 2018 edition.

NFPA 501A, *Standard for Fire Safety Criteria for Manufactured Home Installations, Sites, and Communities,* 2021 edition.

NFPA 502, *Standard for Road Tunnels, Bridges, and Other Limited Access Highways,* 2020 edition.

NFPA 505, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations,* 2018 edition.

NFPA 655, *Standard for Prevention of Sulfur Fires and Explosions,* 2017 edition.

NFPA 731, *Standard for the Installation of Premises Security Systems,* 2020 edition.

NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials,* 2020 edition.

NFPA 804, *Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants,* 2020 edition.

NFPA 805, *Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants,* 2020 edition.

NFPA 820, *Standard for Fire Protection in Wastewater Treatment and Collection Facilities,* 2020 edition.

NFPA 909, *Code for the Protection of Cultural Resource Properties — Museums, Libraries, and Places of Worship,* 2021 edition.

NFPA 914, *Code for the Protection of Historic Structures,* 2019 edition.

NFPA 1123, *Code for Fireworks Display,* 2022 edition.

NFPA 1125, *Code for the Manufacture of Model Rocket and High-Power Rocket Motors,* 2022 edition.

NFPA 1126, *Standard for the Use of Pyrotechnics Before a Proximate Audience,* 2021 edition.

NFPA 1141, *Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas,* 2017 edition.

NFPA 1192, *Standard on Recreational Vehicles,* 2021 edition.

NFPA 1194, *Standard for Recreational Vehicle Parks and Campgrounds,* 2021 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems,* 2019 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus,* 2016 edition.

NFPA 1906, *Standard for Wildland Fire Apparatus,* 2016 edition.

NFPA 1925, *Standard on Marine Fire-Fighting Vessels,* 2018 edition.

NFPA 1962, *Standard for the Care, Use, Inspection, Service Testing, and Replacement of Fire Hose, Couplings, Nozzles, and Fire Hose Appliances,* 2018 edition.

NFPA 5000®, Building Construction and Safety Code®, 2021 edition.

Statement of Problem and Substantiation for Public Input

NFPA 10 has not previously referenced NFPA18A. NFPA 18A. Encapsulating Agents offer another option for fire extinguisher agent.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 116-NFPA 10-2023 [Section No. 2.4]	
Public Input No. 127-NFPA 10-2023 [New Section after 3.3]	
Public Input No. 137-NFPA 10-2023 [Section No. A.1.1]	

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 11 10:51:42 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-44-NFPA 10-2023

Statement: NFPA references have been removed or added due to consolidation efforts at NFPA . NFPA 18A has not been added to 2.2 as proposed since encapsulating agents were not adopted.

NFPA documents added:

NFPA 460, Standard for Aircraft Rescue and Firefighting Services at Airports, 2024 edition.

NFPA 1140, Standard for Wildland Fire Protection, 2022 edition.

NFPA 1225, Standard for Emergency Service Communications, 2022 edition.

NFPA 1900, Standard for Aircraft Rescue and Firefighting Vehicles, Automotive Fire Apparatus, Wildland Fire Apparatus, and Automotive Ambulances, 2024 edition.

NFPA 1910, Standard for the Inspection, Maintenance, Refurbishment, Testing, and Retirement of In-Service Emergency Vehicles and Marine Firefighting Vessels, 2024 edition.

NFPA documents removed:

NFPA 403 has been consolidated into NFPA 460.

NFPA 1141 has been consolidated into NFPA 1140.

NFPA 1221 has been consolidated into NFPA 1225.

NFPA 1901 and NFPA 1906 have been consolidated into NFPA 1900.

NFPA 1925 has been consolidated into NFPA 1910.

Public Input No. 143-NFPA 10-2023 [New Section after 2.3]

2.3.10

The Royal Netherland Standardization Institute (NEN)

NTA 8133:2021, Portable Fire Extinguishers- Performance requirements, tests methods and marking for suitability for extinguishing Lithium Battery Fires.

Additional Proposed Changes

File Name	Description	Approved
NTA_8133-2021-EN_Netherlands_Portable_FE_Testing_for_LIB_1_.pdf	NTA_8133-2021-EN_Netherlands_Portable_FE_Testing_for_LIB_1_.pdf	

Statement of Problem and Substantiation for Public Input

There is no accepted standard in the United States for the testing for Lithium-Ion batteries fires. We added the NEN standard to have a standard for testing and getting extinguishers approved..

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 141-NFPA 10-2023 [New Section after A.5.3.2.4]	

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 10:35:45 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The references do not appear in NFPA 10 and cannot be added to section 2.3.

Public Input No. 75-NFPA 10-2023 [Section No. 2.3.3]

2.3.3 CGA Publications.

Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151.

CGA C-1, *Methods for Pressure Testing Compressed Gas Cylinders*, ~~2016~~ 2022 .

CGA G-10.1, *Commodity Specification for Nitrogen*, ~~2016~~ 2023 .

CGA C-6, *Standard for Visual Inspection of Steel Compressed Gas Cylinders* , 2022.

CGA C-6.1, *Standard for Visual Inspection of High Pressure Aluminum Alloy Compressed Gas Cylinders* , 2019.

CGA C-6.3, *Standard for Visual Inspection of Low Pressure Aluminum Alloy Compressed Gas Cylinders* , 2019.

CGA P-15, *Standard for the Filling of Nonflammable Compressed Gas Cylinders* , 2022.

CGA P-22, *Guideline for the Responsible Management and Disposal of Compressed Gases and Their Cylinders* , 2021.

Statement of Problem and Substantiation for Public Input:

Identifies necessary updates of applicable CGA references for use within the standard.

Statement of Problem and Substantiation for Public Input

Identifies necessary updates of applicable CGA references for use within the standard.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 14:07:08 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The references do not appear in NFPA 10 and cannot be added to section 2.3.

Public Input No. 201-NFPA 10-2023 [Section No. 2.3.4]

2.3.4 UL Publications.

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

UL 1093, ~~*Standard for*~~ *Halogenated Agent Fire Extinguishers*, 1995, revised 2008.

UL 1803, ~~*Standard for*~~ *Factory Follow-Up on Third Party Certified Portable Fire Extinguishers*, 2012, revised ~~2017~~ 2021 .

Statement of Problem and Substantiation for Public Input

Update UL standards to the current edition and revision.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 200-NFPA 10-2023 [Global Input]	
Public Input No. 202-NFPA 10-2023 [Section No. 2.3.6]	
Public Input No. 203-NFPA 10-2023 [Section No. K.1.2.4]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 01 08:25:27 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-45-NFPA 10-2023
Statement: Publication references and organization addresses have been updated to be current. "Standard for" has been removed from all UL references as proposed in the public inputs.

Public Input No. 202-NFPA 10-2023 [Section No. 2.3.6]

2.3.6 UL/ULC Publications.

The following publications are bi-nationally harmonized standards for Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096, and ULC Standards, 171 Nepean Street, Suite 400, Ottawa, Ontario K2P 0B4, Canada.

UL 8, CAN/ULC-S554, *Water Based Agent Fire Extinguishers*, 2016, revised 2020 .

UL 154, CAN/ULC-S503, ~~*Standard for*~~ *Carbon-Dioxide Fire Extinguishers*, 2005, revised ~~2018~~ 2021 .

UL 299, CAN/ULC-S504, ~~*Standard for Dry*~~ *Dry Chemical Fire Extinguishers*, 2012, revised ~~2018~~ 2021 .

UL 626, CAN/ULC-S507, ~~*Standard for Water*~~ *Water Fire Extinguishers*, 2005, revised ~~2018~~ 2021 .

UL 711, CAN/ULC-S508, ~~*Standard for the Rating*~~ *Rating and Fire Testing of Fire Extinguishers*,2018, revised 2023 .

UL 2129, CAN/ULC-S566, ~~*Standard for Halocarbon*~~ *Halocarbon Clean Agent Fire Extinguishers*, 2017, revised 2021 .

Statement of Problem and Substantiation for Public Input

Update UL standards to the current edition and revision.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 200-NFPA 10-2023 [Global Input]	
Public Input No. 201-NFPA 10-2023 [Section No. 2.3.4]	
Public Input No. 203-NFPA 10-2023 [Section No. K.1.2.4]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 01 08:28:02 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-45-NFPA 10-2023
Statement: Publication references and organization addresses have been updated to be current. "Standard for" has been removed from all UL references as proposed in the public inputs.

Public Input No. 116-NFPA 10-2023 [Section No. 2.4]

2.4 References for Extracts in Mandatory Sections.

NFPA 17, *Standard for Dry Chemical Extinguishing Systems,* 2017 edition.

NFPA 17A, *Standard for Wet Chemical Extinguishing Systems,* 2017 edition.

NFPA 18, *Standard on Wetting Agents,* 2017 edition.

NFPA 18A, Standard on Water Additives for Fire Control and Vapor Mitigation, 2022 Edition

NFPA 52, *Vehicular Natural Gas Fuel Systems Code,* 2019 edition.

Statement of Problem and Substantiation for Public Input

NFPA 10 has not previously referenced NFPA18A. NFPA 18A Encapsulating Agents offer another option for fire extinguisher suppressant.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 59-NFPA 10-2023 [Section No. 2.2]	Similar request for adding text

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 06:29:18 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: NFPA 18A is not extracted into NFPA 10 and cannot be added to section 2.4.

Public Input No. 127-NFPA 10-2023 [New Section after 3.3]

Encapsulator Agent

Encapsulating Agent- any Agent that when added to water, forms spherical micelles capable of encapsulating fuel molecules; thus separating the fuel from the oxygen on a chemical molecular level. .

Statement of Problem and Substantiation for Public Input

Encapsulating Agents are part of NFPA 18A, adding the definition here will allow the use of Encapsulating Agents in extinguishers.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 59-NFPA 10-2023 [Section No. 2.2]	Referenced standard

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 07:06:44 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The term “encapsulator agent” should be defined in NFPA 18A if it is an appropriate term to be defined, as it is a water additive. NFPA 10 does not define the agent but, rather, provide the requirements for types of extinguishers associated with classification of fire (Class A, B, etc.). Additionally, the term "encapsulator agent" does not appear in NFPA 10 and can therefore not be added to Chapter 3.

Public Input No. 76-NFPA 10-2023 [Section No. 3.3]

3.3 General Definitions.

3.3.1 ANSI.

American National Standards Institute. [**52,** 2019]

3.3.2 Antifreeze Charge.

See 3.3.20, Loaded Stream Charge.

3.3.3* Carbon Dioxide.

A colorless, odorless, electrically nonconductive inert gas that is a suitable medium for extinguishing Class B and Class C fires.

3.3.4 Chemical.

3.3.4.1* Dry Chemical.

A powder composed of very small particles, usually sodium bicarbonate-, potassium bicarbonate-, or ammonium phosphate-based with added particulate material supplemented by special treatment to provide resistance to packing, resistance to moisture absorption (caking), and the proper flow capabilities. [**17,** 2017]

3.3.4.2* Wet Chemical.

Normally an aqueous solution of organic or inorganic salts or a combination thereof that forms an extinguishing agent. [**17A,** 2017]

3.3.5 Clean Agent.

Electrically non-conducting, volatile, or gaseous fire extinguishant that does not leave a residue upon evaporation.

3.3.6 Closed Recovery System.

3.3.6.1 Dry Chemical Closed Recovery System.

A system that is constructed in a manner that does not introduce foreign material into the agent being recovered and has a means of visually inspecting the recovered agent for contaminants.

3.3.6.2* Halogenated Closed Recovery System.

A system that provides for the transfer of halogenated agents between fire extinguishers, supply containers, and recharge and recovery containers so that none of the halogenated agent escapes to the atmosphere.

3.3.7 Cylinder.

3.3.7.1 High-Pressure Cylinder.

Cylinders (and cartridges) containing nitrogen, compressed air, carbon dioxide, or other gases at a service pressure higher than 500 psi (3447 kPa) at 70°F (21°C).

3.3.7.2 Low-Pressure Cylinder.

Cylinders containing fire-extinguishing agent (medium), nitrogen, compressed air, or other compressed gases at a service pressure of 500 psi (3447 kPa) or lower at 70°F (21°C).

3.3.8 DOT.

U.S. Department of Transportation. [**52,** 2019]

3.3.9* Dry Powder.

Solid materials in powder or granular form intended for the extinguishment of Class D combustible metal fires by crusting, smothering, or heat-transferring means.

3.3.10* Electronic Monitoring.

Either a local alarm device to indicate when an extinguisher is removed from its designated location or a method of electronic communication (data transmission) between an in-place fire extinguisher and an electronic monitoring device/system.

3.3.11 Extinguisher Bracket.

Extinguisher retention device designed to mount and secure a specific extinguisher model onto various surfaces by incorporating releasable straps or bands to secure the fire extinguisher.

3.3.12 Extinguisher Cabinet.

An identifiable and readily accessible fire extinguisher housing device designed to store and protect fire equipment.

3.3.13 Extinguisher Hanger.

Extinguisher mounting device designed for mounting a specific extinguisher model onto stationary vertical surfaces.

3.3.14* Extinguisher Inspection.

A quick check that a fire extinguisher is in its designated place, that it has not been actuated or tampered with, and that there is no obvious physical damage or condition to prevent its operation.

3.3.15* Extinguisher Maintenance.

A thorough examination of the fire extinguisher that is intended to give maximum assurance that a fire extinguisher will operate effectively and safely and to determine if physical damage or condition will prevent its operation, if any repair or replacement is necessary, and if hydrostatic testing or internal maintenance is required.

3.3.16* Film-Forming Foam.

A solution that will form an aqueous film on liquid fuels.

3.3.16.1* Aqueous Film-Forming Foam (AFFF).

A solution based on fluorinated surfactants plus foam stabilizers to produce a fluid aqueous film for suppressing liquid fuel vapors.

3.3.16.2* Film-Forming Fluoroprotein Foam (FFFP).

A protein-foam solution that uses fluorinated surfactants to produce a fluid aqueous film for suppressing liquid fuel vapors.

3.3.17 Flammable Liquids of Appreciable Depth.

Flammable liquids of appreciable depth are those with a depth greater than ¼ in. (6.3 mm).

3.3.18* Halogenated Agents.

Halogenated (clean) agents referenced in this standard are of the following types.

3.3.18.1 Halocarbons.

Halocarbon agents include hydrochlorofluorocarbon (HCFC), hydrofluorocarbon (HFC), perfluorocarbon (PFC), fluoroiodocarbon (FIC) types of agents, and other halocarbons that are found acceptable under the Environmental Protection Agency Significant New Alternatives Policy program.

3.3.18.2 Halons.

Halons include bromochlorodifluoromethane (Halon 1211), bromotrifluoromethane (Halon 1301), and mixtures of Halon 1211 and Halon 1301 (Halon 1211/1301).

3.3.19 Hydrostatic Testing.

Pressure testing of the extinguisher cylinder and certain hose assemblies to verify strength against unwanted rupture.

3.3.20* Loaded Stream Charge.

A water-based extinguishing agent that uses an alkali metal salt as a freezing point depressant.

3.3.21 Mild Steel Shell.

All steel shells other than stainless steel and steel shells used for high-pressure cylinders.

3.3.22 Pressure.

3.3.22.1 Extinguisher Service Pressure.

The normal operating pressure as indicated on the nameplate or cylinder of a fire extinguisher.

3.3.22.2 Factory Test Pressure.

The pressure shown on the nameplate at which a shell was tested at time of manufacture.

3.3.23 Pressurized Flammable Liquid Fires.

Fires resulting from liquids that are forced, pumped, or sprayed.

3.3.24 Recharging.

The replacement of the extinguishing agent (also includes the expellant for certain types of fire extinguishers).

3.3.25 Servicing.

Performing maintenance, recharging, or hydrostatic testing on a fire extinguisher.

3.3.26 TC.

Transport Canada, formerly Canada Transport Commission (CTC), which has jurisdiction over high- and low-pressure cylinders and cartridges in Canada.

3.3.27* Travel Distance.

The actual walking distance from a point to the nearest fire extinguisher fulfilling hazard requirements.

3.3.28 Wetting Agent.

A concentrate that, when added to water, reduces the surface tension and increases its ability to penetrate and spread. [**18,** 2017]

Add the following three definitions into Paragraph 3.3 General Definitions.

3.X.X Certified. Documented recognition of an acceptable level of knowledge and competency, acceptable to the AHJ .

Statement of Problem and Substantiation for Public Input:

A definition is needed to address the existing requirements found in Chapter 7 and 8, Paragraphs 7.1.2.1, 7.1.2.1.1, 7.1.2.1.2, 7.1.2.3, and 8.1.2.1.1.

3.X.X Trained. The instruction necessary to safely and reliably perform service functions, in accordance with NFPA 10.

S **tatement of Problem and Substantiation for Public Input:**

A definition is needed to address the existing requirements found in Chapter 7 and 8, Paragraph 7.1.2.2 and 8.1.2.1.

3.X.X Hand Portable Fire Extinguisher. A listed portable fire extinguisher having a total gross charged weight of 60 lb. (27 kg) or less equipped with carrying handles that can be carried to the fire by a single person .

Statement of Problem and Substantiation for Public Input:

Paragraph 6.1.3.9.3 includes the word “hand” portable fire extinguisher. The term, “hand portable fire extinguisher” is currently not defined in the standard. Resolution is to add a definition to Chapter 3 that is consistent with existing design standards identified in Chapter 2.

Statement of Problem and Substantiation for Public Input

Paragraph 6.1.3.9.3 includes the word “hand” portable fire extinguisher. The term, “hand portable fire extinguisher” is currently not defined in the standard. Resolution is to add a definition to Chapter 3 that is consistent with existing design standards identified in Chapter 2.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 14:18:24 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: CI-28-NFPA 10-2023

Statement: The committee is considering new defined terms "Certified", "Trained", and "Hand Portable Fire Extinguisher". Certified and Trained is expected to be reviewed from NFPA 17 for the use of these terms within NFPA 10 to ensure the new definitions do not introduce a conflict.

Public Input No. 192-NFPA 10-2023 [New Section after 3.3.1]

3.3.1 Agent Suspension

An aqueous stable mixture of solid particles that forms an extinguishing agent.

Statement of Problem and Substantiation for Public Input

As referenced in Clause 1.2.2, “Nothing in this standard shall be construed as a restriction on new technologies or alternative arrangements, provided that the level of protection as herein described is not lowered and is acceptable to the authority having jurisdiction.” A new water-based extinguishing agent in the form of an agent suspension has been evaluated as a component intended for use in fire extinguishers listed and labeled to meet or exceed all requirements of UL 711, CAN/ULC-S508 and UL 8, CAN/ULC-S554.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 191-NFPA 10-2023 [Section No. 7.3.3.1]	
Public Input No. 191-NFPA 10-2023 [Section No. 7.3.3.1]	

Submitter Information Verification

Submitter Full Name: Blake Shugarman
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 31 11:39:32 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: CI-14-NFPA 10-2023
Statement: Additional information needs to be provided (e.g., SDS, service history, previous testing, service manual, stability with vibrations, aging, temperature cycling, stability over time) to fully consider the inclusion of agent suspensions within NFPA 10.

Public Input No. 38-NFPA 10-2022 [Section No. 3.3.10]

3.3.10* Electronic Remote Monitoring.

~~Either a local alarm device to indicate when an extinguisher is removed from its designated location or a method of electronic communication (data transmission) between an in-place~~ The use of data-based communication between an installed fire extinguisher and an electronic monitoring ~~device/system.~~ system.

3.3.10.1 Electric Extinguisher Signaling Device

A device attached or connected to an installed fire extinguisher which locally indicates the status of an extingusher or its cabinet and is not part of an electronic remote monitoring system.

3.3.10.2 Electronic Recordkeeping

A means by which records of fire extinguisher inspections, testing, and/or maintenance events are maintained in whole or part with electronic devices, software, or are created electornically from hard-copy paper documents.

Statement of Problem and Substantiation for Public Input

This PI was Rejected But Held to Next Cycle during the 2nd meeting for the 2021 edition. It is again being presented with some minor edits to create clearer definitions of three possible elements of fire extinguisher inspection, testing, and maintenance involving various types and degrees of 'electronics' or computer technology.
Electronic Remote Monitoring is the term applied to system connected and extinguisher integrated monitoring as an alternative to manual monthly visual inspections.
Electric Extinguisher Signaling Device is the term applied to various anti-theft and anti-vandal devices used in conjunction with extinguishers or cabinets to sound locally if someone opens the door or lifts the extinguisher off the bracket. It is not intended for an alternative to monthly inspections but rather to solve an environmental issue.
Electronic Recordkeeping is just that and makes clear that having records in a software package or database is just an option for managing paper and does not provide any relief from other code requirements.
The intent of these terms is to make it clearer in NFPA 10 where each 'electronic' technology resides and what it can or cant be used for whether it be purely records management all the way up to full blown electronic monitoring in lieu of manual monthly inspections. If accepted these terms would need to be applied primarily in chapter 6 and 7 to effect the intended code clarity for the end users.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 17:56:59 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: The proposed terms are not used within NFPA 10 and can therefore not be adopted in Chapter 3.

Public Input No. 81-NFPA 10-2023 [Section No. 3.3.16]

3.3.16* Film-Forming Foam.

A solution that will form an aqueous film on liquid fuels.

3.3.16.1* Aqueous Film-Forming Foam (AFFF).

A solution based on fluorinated surfactants plus foam stabilizers to produce a fluid aqueous film for suppressing liquid fuel vapors.

3.3.16.2* Film-Forming Fluoroprotein Foam (FFFP).

A protein-foam solution that uses fluorinated surfactants to produce a fluid aqueous film for suppressing liquid fuel vapors.

Revise to read

3.3.16* ~~3.3.10 *~~ Foam. A discharged extinguishing agent solution of bubbles having lower densities than oil or water.

A.3.3.16 Foam is made by mixing air with properly pre-mixed agent solutions from suitably designed equipment. Discharged foam agents flow freely over burning liquid surfaces to extinguish, cool and form an air-excluding blanket able to seal combustible vapors from the oxygen present within air. The foam agents discharged and produced by portable fire extinguishers typically have expansion ratios of less than 20:1 which are classified as "Low-Expansion Foams" by the NFPA-11 Foam Standard .

3.3.16.1* ~~3.3.16 *~~ Film-Forming Foam. A solution that will form an aqueous film on liquid fuels.

3.3.16.1.1* ~~3.3.16.1 *~~ *Aqueous Film-Forming Foam (AFFF).* A solution based on fluorinated surfactants plus foam stabilizers to produce a fluid aqueous film for suppressing liquid fuel vapors.

3.3.16.1.2* ~~3.3.16.2 *~~ *Film-Forming Fluoroprotein Foam (FFFP).* A protein-foam solution that uses fluorinated surfactants to produce a fluid aqueous film for suppressing liquid fuel vapors.

3.3.16.2* ~~3.3.12.8 *~~ *Synthetic Fluorine-Free Foam (SFFF).* Foam concentrate based on a mixture of hydrocarbon surface active agents that is not formulated to contain per- or polyfluoroalkyl substances (PFAS) .

A.3.3.16.2 ~~A.3.3.12.8~~ Synthetic Fluorine-Free Foam (SFFF). Listed SFFF foam portable fire extinguisher agent solutions are intended to specifically address acceptable environmental and health related (PFAS) exposure concerns.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:

Zip:
Submittal Date: Fri May 19 15:28:40 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-17-NFPA 10-2023

Statement: The defined terms foam and synthetic flourine-free foam have been added to be consistent with the rest of NFPA 10 and other revisions being made during this revision cycle. The term “foam” has been used to replace AFFF, FFFP and SFFF throughout NFPA 10 to capture all chemical based foams. AFFF and FFFP are still permitted in many parts of the US and the world. SFFF, while not currently used in portable fire extinguishers, is also a chemical foam. The definition for foam has been extracted from NFPA 11 to remain consistent across NFPA documents.

Public Input No. 64-NFPA 10-2023 [Section No. 3.4.9]

3.4.9 Water-Type Fire Extinguisher.

A fire extinguisher containing water-based agents, such as water, film-forming foam agents (AFFF, FFFP), antifreeze, Wetting agent, Encapsulator Agent (EA), loaded stream, and wet chemical.

Statement of Problem and Substantiation for Public Input

Encapsulating Agents (EA) offer another option of water additives for extinguishers.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 12 11:16:00 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-3-NFPA 10-2023
Statement: To align with the NFPA manual of style, an annex section was created to identify examples of the defined term. This revision clarifies that foam applies to more than just “film-forming” foams. Additionally, antifreeze was removed since it is not used within the industry and is not appropriate to include in the annex.

Public Input No. 82-NFPA 10-2023 [Section No. 3.4.9]

3.4.9 Water-Type Fire Extinguisher.

A fire extinguisher containing water-based agents, such as water, film-forming foam agents (AFFF, FFFP), antifreeze, loaded stream, and wet chemical.

Revise to read

3.4.9 Water-Type Fire Extinguisher. A fire extinguisher containing water-based agents, such as water, ~~film-forming~~ foam agents ~~(AFFF, FFFP)~~ , antifreeze, loaded stream, and wet chemical.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:33:06 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-3-NFPA 10-2023
Statement: To align with the NFPA manual of style, an annex section was created to identify examples of the defined term. This revision clarifies that foam applies to more than just “film-forming” foams. Additionally, antifreeze was removed since it is not used within the industry and is not appropriate to include in the annex.

Public Input No. 145-NFPA 10-2023 [Section No. 4.1.1]

4.1.1*

Portable fire extinguishers used to comply with this standard shall be listed and labeled and shall meet or exceed all the requirements of UL 711, CAN/ULC-S508, *Standard for the Rating and Fire Testing of Fire Extinguishers*, and one of the following applicable performance standards:

(1) Carbon dioxide types: UL 154, CAN/ULC-S503, *Standard for Carbon-Dioxide Fire Extinguishers*

(2) Dry chemical types: UL 299, CAN/ULC-S504, *Standard for Dry Chemical Fire Extinguishers*

(3) Water types: UL 626, CAN/ULC-S507, *Standard for Water Fire Extinguishers*

(4) Halon types: CAN/ULC-S512, *Standard for Halogenated Agent Hand and Wheeled Fire Extinguishers*

(5) Film-forming foam types: UL 8, CAN/ULC-S554, *Water Based Agent Fire Extinguishers*

(6) Halocarbon types: UL 2129, CAN/ULC-S566, *Standard for Halocarbon Clean Agent Fire Extinguishers*

(7) Class L types: (NEN) NTA 8133:2021, *Portable Fire Extinguishers- Preformance requirments, tests methods and marking for suitability for extinguishing Lithium Battery Fires* .

Statement of Problem and Substantiation for Public Input

(NEN) NTA 8133:2021, Portable Fire Extinguishers- Performance requirements, tests methods and marking for suitability for extinguishing Lithium Battery Fires is the only known accepted standard for testing the effectiveness of an extinguishing agent on Lithium-Ion battery fires.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 117-NFPA 10-2023 [Section No. 5.3.1.2]	

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 11:01:27 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: It is unclear whether NTA 8133, Portable Fire Extinguishers Performance requirements, tests methods and marking for suitability for extinguishing Lithium Battery Fires, 2021 is a mandatory document. Non-mandatory documents cannot not be adopted by reference in the mandatory sections of NFPA 10. The proposed inclusion of the NTA document does not provide adequate substantiation that the document aligns with the rest of NFPA 10 and UL testing standards. Upon a review of the document, the committee found concerns within the document such as: The stated goal of NEN-NTA 8133:2021 is “to develop a good, standardized fire extinguishing test that can demonstrate the suitability of the extinguishing agent for extinguishing lithium[-ion] battery fires.” Suitability of the “extinguishing agent” alone and not the “fire extinguisher” would be in conflict with the requirements referenced in NFPA 10, Clause 4.1.1, specifically with reference to the scope of UL 154, CAN/ULC-S503; UL 299, CAN/ULC-S504; UL 626, CAN/ULC-S507; CAN/ULC-S512; UL 8, CAN/ULC-S554; and UL 2129, CAN/ULC-S566; which indicates “These requirements cover the construction and performance, exclusive of performance during fire tests, of portable […] fire extinguishers.” (or the equivalent). The NEN-NTA 8133:2021

Forward indicates “this NTA describes performance requirements for portable fire extinguishers, in addition to the requirements of NEN-EN 3-7+A1:2007, to demonstrate their suitability for extinguishing fires in rechargeable and non-rechargeable batteries based on lithium[-ion] chemistry with a limited capacity as used in: portable electronic equipment (smartphones, laptops); power tools and domestic appliances; portable medical equipment; toys and radio-controlled objects; drones; bicycles. This NTA contains general requirements and procedures for extinguishing tests. The size of the extinguishing tests is comparable to the battery capacities in the abovementioned applications.” The extinguishing tests referenced in NTA 8133 have a nominal battery capacity of 600 Wh and the test is conducted with flat pouch cells that are not installed in an array that considers enclosure obstructions. Each of the product types referenced in the Forward (above) includes an enclosure. No matter how successful any extinguisher and extinguishing agent combination is, the product enclosure will significantly limit if not completely prevent any extinguishing agent from reaching the cells. Further, the enclosure might contain thermal energy and exacerbate the severity of thermal runaway propagation. NEN-NTA 8133:2021, in addition to the test defined therein, also requires compliance with NEN-EN 3-7+A1:2007, Clause 6.4.2 (covering A-rating) and NEN-EN 3-7+A1:2007, Clause 9 (suitability for use on live electrical equipment at 35,000 V). This would be in conflict with the requirements referenced in NFPA 10, Clause 4.1.1, specifically with reference to UL 711 and CAN/ULC-S508, Clause 7 (Class A wood crib fire test and Class A wood panel fire test) and specifically with reference to UL 711 and CAN/ULC-S508, Clause 9 (Class C electrical conductivity test at 100,000 V). NEN-NTA 8133:2017 indicates “[a] portable fire extinguisher which is suitable for extinguishing combined flat pouch cells with a certain nominal capacity, is deemed to be suitable for extinguishing combined cylindrical cells with the same or lower nominal capacity as well.” NEN-NTA 8133:2021 only provides for pouch cells to be used for testing purposes. Cylindrical cells can result in significantly more severe thermal runaway propagation, as the propagation can occur radially outward. In addition specifying “NMC” (nickel, manganese, cobalt) cells is not deemed to be sufficient. There exist lower nickel content cells, such as NMC111, and higher nickel content cells, such as NMC811. The lower the nickel content the less the thermal runaway propagation. Nickel reduces thermal stability in order to achieve greater energy capacity (Reference: https://www.sciencedirect.com/science/article/abs/pii/S0304389418301675). Other uncontrolled test features, such as, separators and electrolyte might also influence the severity of thermal runaway propagation. In essence, the issue is whether the flat pouch cells specified are representative of the real hazards. There are several lithium-ion battery chemistries, beyond NMC as specified in NTA 8133, that might provide varying results. Chemistries include, but are not limited to, NCA (nickel cobalt aluminum cathode), LFP (lithium iron phosphate cathode), LTO (lithium titanate oxide cathode), LCO (lithium cobalt oxide cathode), and LMO (lithium manganese oxide).

Public Input No. 171-NFPA 10-2023 [Section No. 4.1.1]

4.1.1*

Portable fire extinguishers used to comply with this standard shall be listed and labeled and shall meet or exceed all the requirements of UL 711, CAN/ULC-S508, *Standard for the Rating and Fire Testing of Fire Extinguishers*, and one of the following applicable performance standards:

(1) Carbon dioxide types: UL 154, CAN/ULC-S503, *Standard for Carbon-Dioxide Fire Extinguishers*

(2) Dry chemical types: UL 299, CAN/ULC-S504, *Standard for Dry Chemical Fire Extinguishers*

(3) Water types: UL 626, CAN/ULC-S507, *Standard for Water Fire Extinguishers*

(4) Halon types: CAN/ULC-S512, *Standard for Halogenated Agent Hand and Wheeled Fire Extinguishers*

(5) Film-forming foam types: UL 8, CAN/ULC-S554, *Water Based Agent Fire Extinguishers*

(6) Halocarbon types: UL 2129, CAN/ULC-S566, *Standard for Halocarbon Clean Agent Fire Extinguishers*

(7) Encapsulating types: UL XXX, CAN/ULC-XXX, *Standard for Encapsulator Agent Fire Extinguishers* [Reserve]

Statement of Problem and Substantiation for Public Input

Fire extinguishers that utilize encapsulator agents are currently being developed by various parties but are not recognized by NFPA 10. These agents typically consist of a solution of mineral-based particles suspended in water. When the agent is applied to a fire source, the water evaporates and the particles form a solid barrier around the flaming object(s), effectively separating the fuel from the surrounding oxygen which inhibits the combustion process. Additionally, these agents generally have high heat capacities and are not electrically conductive. Encapsulator agents are currently under development, however, they have been shown to be particularly effective in controlling and suppressing fires of lithium-ion batteries, controlling thermal runaway, and reducing the explosion risk. These agents are recognized in the latest edition of NFPA 18A and UL is currently developing a certification for such agents. With these recent development, it is appropriate to reserve a section that defines the acceptance criteria for encpsulator based extinguishers.

NOTE: The amendment to this section should be reserved until the standard for for encapsulator agent fire extinguishers has been fully developed.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 17:41:50 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The reference being proposed is a water based document and covered already under UL 8 (ULC S554). Additionally, the proposed document, Standard for Encapsulator Agent Fire Extinguishers, has not yet been issued and cannot be adopted into the mandatory section of NFPA 10.

Public Input No. 170-NFPA 10-2023 [Section No. 4.1.4 [Excluding any Sub-Sections]]

Extinguishers listed for the Class C or Class L rating shall not contain an agent that is a conductor of electricity.

Statement of Problem and Substantiation for Public Input

Since fires involving lithium batteries and equipment are electrical in nature, extinguishers for Class L fires should be required not to contain agents that are conductors of electricity.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of a Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 26 18:56:54 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Class L has not been defined as a class of fire and cannot be included here. Additionally, this section refers to non-conductivity agents which is specific to Class C listed extinguishers. The inclusion of any other class of extinguisher in this section would not be appropriate. Any water-based agent contained in a fire extinguisher identified in this section must align with sections 4.1.4.1 and 4.1.4.2.

Public Input No. 13-NFPA 10-2022 [Section No. 4.2]

4.2* Identification of Contents.

A fire extinguisher shall have a label, tag, or stencil attached to it providing the following information:

(1) The content's product name as it appears on the manufacturer's ~~Material~~ Safety Data Sheet (~~MSDS~~ SDS)

(2) Listing of the hazardous material identification in accordance with *Hazardous Materials Identification System (HMIS) Implementation Manual* [in Canada, *Globally Harmonized System of Classification and Labeling of Chemicals (GHS)*]

(3) List of any hazardous materials that are in excess of 1.0 percent of the contents

(4) List of each chemical in excess of 5.0 percent of the contents

(5) Information as to what is hazardous about the agent in accordance with the ~~MSDS~~ SDS

(6) Manufacturer's or service agency's name, mailing address, and phone number

Statement of Problem and Substantiation for Public Input

As of June 1, 2015, Material Safety Data Sheets (MSDS) were required to be replaced with Safety Data Sheets (SDS)

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 14-NFPA 10-2022 [Section No. A.4.2]	

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
Zip:
Submittal Date: Fri Feb 11 10:22:21 EST 2022
Committee: PFE-AAA

Committee Statement

Resolution: FR-1-NFPA 10-2023
Statement: As of June 1, 2015, Material Safety Data Sheets (MSDS) were required to be replaced with Safety Data Sheets (SDS). This revision aligns with this change to SDS.

Public Input No. 29-NFPA 10-2022 [Section No. 4.3.2]

4.3.2

The manual shall refer to this standard as a source of ~~detailed instruction~~ additional information regarding the selection, installation, placement, and servicing of the portable fire extinguisher .

Statement of Problem and Substantiation for Public Input

NFPA 10 does not provide detailed, or any other type, of instruction on the operation of portable fire extinguishers. It is the extinguisher manufacturer's responsibility to provide detailed instructions for their respective product's operation. It is not the purchaser or end-user of a fire extinguisher's role or even capability to consult with NFPA 10 as the source of detailed information on the use, installation, or servicing of any manufacturer's extinguisher. NFPA 10 as a 'code' may certainly be applicable to the fire extinguisher but it is not the source for all things 'detailed' about a specific individual extinguisher product. For reference see 1.1.1 and 1.1.2 which clearly indicates that NFPA 10 is the minimum requirements for selection, installation, and servicing. This requirement appears to be a hold-over or simply outdated given the current state of portable fire extinguishers on the market serving every occupancy from a single family dwelling through the largest complex industrial use and it may simply be better off deleted from the document. If not, then at a minimum the reference to NFPA 10 in any extinguisher manufacturer's manual should be supplemental at best and not a 'detailed information' source.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing any Entity, Group or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed May 25 15:47:19 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: FR-2-NFPA 10-2023

Statement: It is the extinguisher manufacturer's responsibility to provide detailed instructions for their respective product's operation. It is the role of the purchaser or end-user of a fire extinguisher to properly consult with NFPA 10 as the source of requirements on the selection, installation, and servicing of any manufacturer's extinguisher.

Public Input No. 83-NFPA 10-2023 [Section No. 4.4 [Excluding any Sub-Sections]]

The following types of fire extinguishers are considered obsolete and shall be removed from service:

(1) Soda acid

(2) Chemical foam ~~(excluding film-forming agents)~~

(3) Carbon tetrachloride, methyl bromide, and chlorobromomethane (CBM)

(4) Cartridge-operated water

(5) Cartridge-operated loaded stream

(6) Copper or brass shell (excluding pump tanks) joined by soft solder or rivets

(7) Carbon dioxide extinguishers with metal horns

(8) Solid charge–type AFFF extinguishers (paper cartridge)

(9) Pressurized water fire extinguishers manufactured prior to 1971

(10) Any extinguisher that needs to be inverted to operate

(11) Any extinguisher manufactured prior to 1955

(12) Any extinguishers with 4B, 6B, 8B, 12B, and 16B fire ratings

(13) Stored-pressure water extinguishers with fiberglass shells (pre-1976)

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:35:58 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-6-NFPA 10-2023
Statement: This revision clarifies that the only chemical foam that is to be removed from service are those chemical foams that contain sodium bicarbonate with aluminium sulphate.

Public Input No. 31-NFPA 10-2022 [Section No. 5.2.2]

5.2.2 Class B Fires.

Class B fires ~~are fires in flammable liquids, combustible liquids, and flammable gases~~ involve liquids or gases which are capable of being ignited .

Statement of Problem and Substantiation for Public Input

While the technicality and nuance of what a flammable or combustible liquid / gas is under a variety of other codes, standards, and regulations matters within the context of those documents NFPA 10 is only concerned with whether or not a liquid or gas could be ignited and therefore would benefit from readily available first defense fire extinguishers. For this reason the NFPA 10 definition of a Class B fire should be broad enough to capture all possible liquid / gas materials which could become ignited and burn, regardless of how they are individual classified by other documents. This change only addresses the definition of Class B and not the technical elements of proper selection of an extinguisher, that remains a function of Annex C and the specific extinguisher product.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed May 25 16:20:15 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: The current language sufficiently covers the concerns of the submitter. The substantiation of the proposed revision does not provide clarity to an increase in safety or explain how the existing language is problematic.

Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]

5.2.6 Class L Fires

Class L fires are fires that involve the use or storage of energized lithium batteries including batteries within equipment or vehicles.

Statement of Problem and Substantiation for Public Input

Lithium batteries and energy storage systems have become the dominant type of rechargeable energy source for a variety of industrial applications including transportation and electrochemical energy storage. It is well known that extinguishment of lithium energy-related fires is difficult, requiring large quantities of water and, even with apparent success, the risk of thermal runaway and reignition remains. The growing use of lithium batteries has been followed by efforts to better understand the fire hazards posed by this technology as well as suitable fire protection and suppression methods. Despite the increasing popularity of lithium energy installations, the available research on the control and suppression of fires in installations of this type is relatively limited. As a result, few regulations pertaining to this topic have been implemented by agencies such as the ICC or NFPA. New requirements have been published in recent years relating to the use of lithium-ion batteries in energy storage systems, including NFPA 855, Standard for the Installation of Stationary Energy Storage Systems Chapter 9, Electrochemical Energy Storage Systems (2020 and 2023 editions); and International Fire Code Section 1207, Electrical Energy Storage Systems (2021 edition). However, lithium battery fires are not currently addressed as a stand-alone hazard in any NFPA standards. These proposed changes to NFPA 10 provide a basis for further development of codes and standards related to the control and suppression of lithium battery installations by acknowledging the unique fire hazard they present. This is accomplished by creating a new class of fires specific to the industrial use of lithium-ion batteries referred to in these proposals as “Class L.” In addition, language has been proposed that acknowledges the use of fire extinguishers that utilize encapsulating agents. These types of extinguishers are currently in development, although there are no test standards that have been developed for such extinguishers. However, these extinguishing agents have been acknowledged in other NFPA standards (NFPA 18A, 2022 edition) as being effective on lithium batteries.

As noted in the 2022 Edition of NFPA 18A, Section A.4.3, lithium-ion batteries and energy storage systems present unique fire hazards that include elements from multiple currently defined fire classes (Class A, Class B, Class C, and Class D). First, lithium battery fires are inherently electrical in nature and often operate at high voltages thereby presenting a Class C fire hazard. Additionally, as with other Class C hazards, once the charge in a lithium battery has been depleted, the fire can change in character to represent a Class A, Class B, or combined Class A and B fire. The organic electrolyte present in many lithium batteries is the main contributor to its Class B fire hazard due to the thermal decomposition of the organic electrolyte within the battery which produces flammable gasses and presents and explosion hazard. Lastly, while lithium-ion batteries do not contain solid lithium; lithium-metal batteries utilize solid state lithium metal anodes thereby presenting a Class D hazard. Lithium-ion batteries can also include other potentially hazardous metals such as aluminum and copper.

In addition to the combination of these four fire classes within one entity, none of the test methods for the individual fire classes adequately represent the hazard posed by lithium batteries. Typically, Class A fires are represented by wood and other cellulosic fuels, Class B fires are represented by flammable or combustible liquid pool or spill fires, and Class D fires are represented by piles of metal shavings. Clearly, tests using fuels such as these would not be able to identify the hazard associated with lithium batteries.

There is not one test arrangement that typifies a Class C fire, however, lithium batteries provide a specific additional threat that differentiates them from a typical Class C fire which is the occurrence of thermal runaway. This is a phenomenon that typically occurs when cells within the battery are damaged, contain a defect, or when a battery is misused. The damage to the cell causes a short circuit and results in a condition where the unrestricted flow of energy through the cell results in a rapid temperature increase such that heat is generated at a faster rate than the heat can escape. The increased cell temperature causes thermal degradation of the electrolyte, producing flammable gasses and often a small explosion. This damages the adjacent cells within the battery which then also begin to undergo thermal runaway. The result is a self-sustaining exothermic reaction that produces intense and long-duration fires. While for typical Class C fire, one of the first modes of action is often to deenergize the equipment, this is not possible with a battery as the battery itself is a source of electrical energy. Therefore, this reaction is sustained either until the charge in the battery is completely depleted or external actions are taken such as the use of an extinguishing agent. However, many extinguishing and suppression methods may be successful at controlling thermal runaway, few are able to completely stop this reaction.

For these reasons, it is believed that the best method for recognizing the unique hazard presented by lithium batteries and related equipment and assuring that agents specially certified for their extinguishment are used is by creating the new fire classification (Class L).

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 170-NFPA 10-2023 [Section No. 4.1.4 [Excluding any Sub-Sections]]	
Public Input No. 173-NFPA 10-2023 [Section No. 5.3.1.2]	
Public Input No. 174-NFPA 10-2023 [New Section after 5.3.2.5]	
Public Input No. 180-NFPA 10-2023 [New Section after E.7]	
Public Input No. 181-NFPA 10-2023 [New Section after E.7]	
Public Input No. 182-NFPA 10-2023 [New Section after 6.6]	
Public Input No. 183-NFPA 10-2023 [New Section after 6.6]	
Public Input No. 184-NFPA 10-2023 [New Section after 6.6]	
Public Input No. 185-NFPA 10-2023 [New Section after 6.6]	
Public Input No. 186-NFPA 10-2023 [Section No. G.1.1]	
Public Input No. 187-NFPA 10-2023 [Section No. B.2.2]	
Public Input No. 189-NFPA 10-2023 [Section No. B.1.1]	

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 17:51:08 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10.

Public Input No. 62-NFPA 10-2023 [New Section after 5.2.5]

Class L- Lithium Ion Battery

Class L fires are fires involving Lithium Ion battery which are a unique electrochemical fire hazard that involves multiple classes (Class A, Class B, Class C ,Class D) within one entity.

Additional Proposed Changes

File Name	Description	Approved
TR_F5_AM_Kiwa_Nederland_BV_Lithium_Ion_Battery_Fire_Extinguishment_Testing_Final_Report.pdf	KIWA Report	
Comments_for_5.2.5.docx	Justification notes	
Comments_for_5.2.5.docx	KIWA Testing Video	

Statement of Problem and Substantiation for Public Input

Lithium Ion battery which are a unique electrochemical fire hazard that involves multiple classes (Class A, Class B, Class C ,Class D) within one entity. Having a new Class of fire extinguisher is necessary to provide a means of extinguishing these fires.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 118-NFPA 10-2023 [Section No. 5.5.3.1]	
Public Input No. 124-NFPA 10-2023 [New Section after 5.5.4]	
Public Input No. 144-NFPA 10-2023 [New Section after 6.6]	

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 12 10:55:52 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on

Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10.

As noted in NFPA 18A- A.4.3℀

Lithium-ion battery and lithium-ion battery energy storage system (BESS) fires are unique electrochemical fire hazards that involve multiple fire classes (Class A, Class B, Class C, Class D) within one entity.

As noted in the preface of the attached KIWA report “Well-known fact is that, once started, a li-ion battery on fire is practically unstoppable and therefore difficult to extinguish.

In the conclusion of the KIWA report it is noted A hand fire extinguisher unit with (deleted) Encapsulator Agent as an additive is significantly better able to achieve suppression mode directly after ignition of a single 1,9 kWh Cleantron battery than a hand fire extinguisher unit with standard powder or foam.

As can be seen I the attached video the Encapsulator Agent (EA) extinguisher used is effective in controlling and suppressing the LIB fire while the other Agents used were not.

Having a separate Class for “L” type battery fires makes sense and will allow for specific attention to be given to providing additional solutions for this new class of fire.

As noted in NFPA 18A- A.4.3℀

Lithium-ion battery and lithium-ion battery energy storage system (BESS) fires are unique electrochemical fire hazards that involve multiple fire classes (Class A, Class B, Class C, Class D) within one entity.

As noted in the preface of the attached KIWA report “Well-known fact is that, once started, a li-ion battery on fire is practically unstoppable and therefore difficult to extinguish.

In the conclusion of the KIWA report it is noted A hand fire extinguisher unit with (deleted) Encapsulator Agent as an additive is significantly better able to achieve suppression mode directly after ignition of a single 1,9 kWh Cleantron battery than a hand fire extinguisher unit with standard powder or foam.

As can be seen I the attached video the Encapsulator Agent (EA) extinguisher used is effective in controlling and suppressing the LIB fire while the other Agents used were not.

Having a separate Class for “L” type battery fires makes sense and will allow for specific attention to be given to providing additional solutions for this new class of fire.

Public Input No. 69-NFPA 10-2023 [New Section after 5.2.5]

5.2.6 Class T Fire
Class T fires are fire that involve Lithium style batteries and other technologies.

Statement of Problem and Substantiation for Public Input

Currently there are no listings for fire extinguisher or UL test standard, but you will see companies that say that their product can be used a fire Lithium and other technologies batteries.

The big question is what class of fire is a lithium battery event? We know there may be some DC electric charge on the unit, we may have toxic, flammable/combustible gases released during an event where a battery is damaged or abused. Some folks may even say that it is a combustible metal fire.

By making a new class we can educate all parties on the true hazards of these types of batteries, the class of fire and develop ne UL standards for extinguisher that are used on their batteries.

I understand that I may be missing some data and other code section, but I develop the committee should review the issue related to fire extinguisher use on battery fires and determine the correct testing, listing and location to protect this hazard.

We know the hazard is real at single family homes, apartments, offices, business, and other occupancies.

There has been multiple reports of these types of fires that resulted in injuries and even deaths.

I would recommend that the committee have a working group to determine what is best for this type of event, to determine a new class of fire or exclude portable fire extinguisher from the scope of work for lithium and other technologies batteries.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 72-NFPA 10-2023 [New Section after 6.6]	same subject
Public Input No. 70-NFPA 10-2023 [New Section after 5.5.4.8.2]	
Public Input No. 73-NFPA 10-2023 [Section No. 1.1 [Excluding any Sub-Sections]]	

Submitter Information Verification

Submitter Full Name: Joe McElvaney
Organization: The Hiller Companies
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 12 11:26:49 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including

venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10.

Public Input No. 117-NFPA 10-2023 [Section No. 5.3.1.2]

5.3.1.2

Fire extinguishers classified for use on Class C, Class D, Class K, or ~~Class K~~ Class L hazards shall not be required to have a number preceding the classification letter.

Statement of Problem and Substantiation for Public Input

Added language for new Class L extinguishers to be consistent with other Classes of extinguishers.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 145-NFPA 10-2023 [Section No. 4.1.1]	

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 06:39:13 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10.

Public Input No. 173-NFPA 10-2023 [Section No. 5.3.1.2]

5.3.1.2

Fire extinguishers classified for use on Class C, Class D, Class K, or ~~Class K~~ Class L hazards shall not be required to have a number preceding the classification letter.

Statement of Problem and Substantiation for Public Input

Currently, numbered rating systems only exist for fire extinguishers classified for use on Class A and Class B hazards. Therefore, extinguishers for use on Class L fires have been added to Section 5.3.1.2 as those that do not require a number rating. This is subject to change depending upon the outcome of the UL certification process.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of the Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 17:57:21 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10.

Public Input No. 174-NFPA 10-2023 [New Section after 5.3.2.5]

5.3.2.6

Fire extinguishers and extinguishing agents for the protection of Class L hazards shall be of the types specifically listed and labeled for use on Class L fires.

Statement of Problem and Substantiation for Public Input

Similar to Sections 5.3.2.1 – 5.3.2.5 for Class A, B, C, D, and K hazards, this section adds the requirement that extinguishers for the protection Class L hazards must be listed and labeled for use for this specific hazard.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of the Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 17:59:49 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10.

Public Input No. 63-NFPA 10-2023 [New Section after 5.3.2.5]

5.3.2.6

Fire extinguishers for the protection of Class L hazards shall be selected from types that are specifically listed and labeled for use on Class L fires.

Statement of Problem and Substantiation for Public Input

Added language for new Class L extinguishers to be consistent with other Classes of extinguishers.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 12 10:59:03 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10.

Public Input No. 71-NFPA 10-2023 [New Section after 5.3.2.5]

5.3.2.6 Fire extinguishers for the protection of Class T hazards shall be selected for the types that are specifically listed and label for use on Class T fires.

Statement of Problem and Substantiation for Public Input

Currently there are no listings for fire extinguisher or UL test standard, but you will see companies that say that their product can be used a fire Lithium and other technologies batteries.

The big question is what class of fire is a lithium battery event? We know there may be some DC electric charge on the unit, we may have toxic, flammable/combustible gases released during an event where a battery is damaged or abused. Some folks may even say that it is a combustible metal fire.

By making a new class we can educate all parties on the true hazards of these types of batteries, the class of fire and develop ne UL standards for extinguisher that are used on their batteries.

I understand that I may be missing some data and other code section, but I develop the committee should review the issue related to fire extinguisher use on battery fires and determine the correct testing, listing and location to protect this hazard.

We know the hazard is real at single family homes, apartments, offices, business, and other occupancies.

There has been multiple reports of these types of fires that resulted in injuries and even deaths.

I would recommend that the committee have a working group to determine what is best for this type of event, to determine a new class of fire or exclude portable fire extinguisher from the scope of work for lithium and other technologies batteries.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 72-NFPA 10-2023 [New Section after 6.6]	same subject

Submitter Information Verification

Submitter Full Name: Joe McElvaney
Organization: The Hiller Companies
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 12 11:59:48 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from

cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10.

Public Input No. 10-NFPA 10-2021 [New Section after 5.5.2]

Hanged automatic sprinkler fire extinguishers

Hanged automatic sprinkler fire extinguishers are not tested or allowed to be used

Statement of Problem and Substantiation for Public Input

People are using sometimes hanged automatic sprinkler fire extinguisher replacing both extinguisher and sprinkler in existing building and the failure for these gadget is high, it should be stated clearly that it is not allowed or approved

Submitter Information Verification

Submitter Full Name: Bilal Saad
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Dec 30 01:12:51 EST 2021
Committee: PFE-AAA

Committee Statement

Resolution: An automatic sprinkler fire extinguisher as described is not a portable fire extinguisher (Reference NFPA 10, Section 3.4.3). Therefore this proposed revision is outside the scope of NFPA 10.

Public Input No. 25-NFPA 10-2022 [Section No. 5.5.2]

5.5.2 Selection for Building Protection.

Fire extinguishers for building protection shall be selected for Class A fires, regardless of the presence of any fixed fire suppression systems.

5.5.2.1

Fire extinguishers with Class C ratings shall be provided for buildings or structures which contain electrical power systems or electrical energy storage systems.

Statement of Problem and Substantiation for Public Input

When electrical power or energy is present in a building or an unenclosed structure the selection of extinguishers must consider the presence of power even if it may be battery storage or photovoltaic equipment as is trending. Not all buildings are limited to utility power and utility voltages anymore, remote buildings may be off-grid and use stored energy systems which are none the less a Class C hazard.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Sat May 21 09:24:48 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: Class C fires are fires that involve energized electrical equipment and are already covered in 5.2.3 and 5.5.3. Adding the proposed new language in 5.5.2.1 is not needed and the concerns of the submitter are already covered in the other sections mentioned.

Public Input No. 118-NFPA 10-2023 [Section No. 5.5.3.1]

5.5.3.1

Fire extinguishers for occupancy hazard protection shall be provided by fire extinguishers for Class A, B, C, D, K, or ~~K~~ L fire hazards present or anticipated to be present.

Statement of Problem and Substantiation for Public Input

Added language for new Class L extinguishers to be consistent with other Classes of extinguishers.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 62-NFPA 10-2023 [New Section after 5.2.5]	

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 06:40:40 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10.

Public Input No. 124-NFPA 10-2023 [New Section after 5.5.4]

5.5.4.5.6 Class L Rechargeable Equipment Fires

Fire extinguishers provided for the protection of Class L fires shall be listed and labeled for Class L fires.

Statement of Problem and Substantiation for Public Input

Added new section for Class L fires.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 62-NFPA 10-2023 [New Section after 5.2.5]	

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 07:00:54 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L and Class T have also not been incorporated for these reasons.

Public Input No. 119-NFPA 10-2023 [Section No. 5.5.4.2]

5.5.4.2* Three-Dimensional Fires.

Large-capacity dry chemical or Approved Encapsulator Agent (EA) extinguishers of 10 lb (4.54 kg) or greater and with a discharge rate of 1 lb/sec (0.45 kg/sec) or more shall be selected to protect these hazards.

Statement of Problem and Substantiation for Public Input

Encapsulator Agents (EA) are a suitable agent for fighting 3 dimensional fires.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 06:41:54 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: There is insufficient information to support water based agent fire extinguishers as being effective at suppressing and extinguishing three-dimensional fires. Portable fire extinguishers used to comply with NFPA 10 shall be listed and labeled (not approved).

Public Input No. 120-NFPA 10-2023 [Section No. 5.5.4.3]

5.5.4.3 Obstacle Fires.

Selection of a fire extinguisher for this type of hazard shall be based on one of the following:

(1) Extinguisher containing a vapor-suppressing foam agent or vapor Encapsulating Agent (EA).

(2) * Multiple extinguishers containing non-vapor-suppressing Class B agents intended for simultaneous application

(3) Larger capacity extinguishers of 10 lb (4.54 kg) or greater and with a minimum discharge rate of 1 lb/sec (0.45 kg/sec)

Statement of Problem and Substantiation for Public Input

Added language for Encapsulator Agents (EA) as an acceptable agent for fighting these types of fires.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 06:42:59 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: There is insufficient information to support water based encapsulating agent fire extinguishers as being effective at vapor-suppressing and extinguishing obstacle fires.

Public Input No. 84-NFPA 10-2023 [Section No. 5.5.4.4]

5.5.4.4* Water-Soluble Liquid Fires (Polar Solvents).

~~Aqueous film-forming foam (AFFF) and film-forming fluoroprotein (FFFP) foam~~ Foam types of fire extinguishers shall not be selected for the protection of water-soluble flammable or combustible liquids, unless specifically referenced on the fire extinguisher's nameplate.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:37:46 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-7-NFPA 10-2023
Statement: There are several different types of foam fire extinguishers listed and labeled for this type of application. This revision covers all listed and labeled foam fire extinguishers.

Public Input No. 106-NFPA 10-2023 [Section No. 5.5.4.6.1]

5.5.4.6.1

Fire extinguishers for the protection of ~~delicate~~ energized electronic equipment shall be selected from types specifically listed and labeled for Class C hazards. *(See 5.3.2.3.)*

Statement of Problem and Substantiation for Public Input

1. There is no specific definition for delicate electronic equipment.

2. Today a very broad scope of electronic equipment exist that can be considered delicate.

3. Existing language technically prohibits the use or placement of dry chemical extinguisher models within most common occupancies and applications, presenting liability issues.

4. Section requirements should only apply to potentially energized electronic equipment fire can occur and not applications where packaged or stored electronic equipment is simply present.

5. Code requirement objectives have always addressed minimum necessary fire safety and extinguishment needs and not dictate the owner's equipment exposure clean up and/or replacement decisions. The 72 other NFPA standards identified within chapter two already address special occupancy and hazard extinguisher recommendations where specifically desired agent types can be dictated.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 17:07:28 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Language has been added to sections A.5.5.4.6 and A.5.5.4.6.2 which added guidance on delicate electronics.

Public Input No. 39-NFPA 10-2022 [Section No. 5.5.4.6.1]

5.5.4.6.1

Fire extinguishers for the protection of ~~delicate~~ life safety or mission critical electronic equipment shall be selected from types specifically listed and labeled for Class C hazards. *(See 5.3.2.3.)*

Statement of Problem and Substantiation for Public Input

This is an effort to provide better user guidance to the ambiguity of 'delicate electronics'. In a society where practically every desk and workstation now has a computer, tablet, or touchscreen on it we are surrounded by electronics which are generally delicate by design. There is a huge disparity between a POS tablet and a 250K ATM machine yet 'delicate' is the word we provide for guidance. Nothing in NFPA 10 prevents an owner or operator from selecting something better than the code minimum but we should instead focus on those electronics which are providing a life safety or mission critical function in a building as the carve out for clean agent protection without risk of dry chemical residue. It may not so much be the monetary value of the equipment to consider but rather the harm or risk provided by an impaired life safety or mission critical electronics. Stopping the incipient fire is certainly the intent but preserving function of life safety and mission critical equipment is also part of a successful outcome.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 40-NFPA 10-2022 [Section No. 5.5.4.6.2]	
Public Input No. 41-NFPA 10-2022 [Section No. A.5.5.4.6]	

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 18:13:30 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: Language has been added to sections A.5.5.4.6 and A.5.5.4.6.2 which added guidance on delicate electronics.

Public Input No. 107-NFPA 10-2023 [Section No. 5.5.4.6.2]

~~5.5.4.6.2~~ ~~*~~ –

~~Dry chemical fire extinguishers shall not be installed for the protection of delicate electronic equipment.~~

Statement of Problem and Substantiation for Public Input

1. There is no specific definition for delicate electronic equipment.

2. Today a very broad scope of electronic equipment exist that can be considered delicate.

3. Existing language technically prohibits the use or placement of dry chemical extinguisher models within most common occupancies and applications, presenting liability issues.

4. Section requirements should only apply to potentially energized electronic equipment fire can occur and not applications where packaged or stored electronic equipment is simply present.

5. Code requirement objectives have always addressed minimum necessary fire safety and extinguishment needs and not dictate the owner's equipment exposure clean up and/or replacement decisions. The 72 other NFPA standards identified within chapter two already address special occupancy and hazard extinguisher recommendations where specifically desired agent types can be dictated.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 17:11:21 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Language has been added to sections A.5.5.4.6 and A.5.5.4.6.2 which added guidance on delicate electronics.

Public Input No. 40-NFPA 10-2022 [Section No. 5.5.4.6.2]

5.5.4.6.2*

Dry chemical fire extinguishers shall not be installed for the protection of ~~delicate electronic~~ life safety and mission critical electronic equipment.

Statement of Problem and Substantiation for Public Input

See PI #39 for explanation. This PI simply incorporates the proposed changed.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 39-NFPA 10-2022 [Section No. 5.5.4.6.1]	
Public Input No. 41-NFPA 10-2022 [Section No. A.5.5.4.6]	

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 18:21:11 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: Language has been added to sections A.5.5.4.6 and A.5.5.4.6.2 which added guidance on delicate electronics.

Public Input No. 125-NFPA 10-2023 [Section No. 5.5.4.7.1]

5.5.4.7.1

Only water, Encapsulator Agent (EA), or foam extinguishers shall be installed in areas where pool chemicals containing chlorine or bromine are stored.

Statement of Problem and Substantiation for Public Input

Added language for Encapsulator Agent (EA) to be acceptable to fire fires in these locations.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 07:02:37 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: There is insufficient information to support water based encapsulating agent fire extinguishers as being effective for areas containing oxidizers.

Public Input No. 70-NFPA 10-2023 [New Section after 5.5.4.8.2]

5.5.4.9 Class T Lithium and other battery technologies

Fire extinguisher or container of Class T extinguishing agent provided for the protection of Class T fire shall be listed and labeled for Class T fires.

Statement of Problem and Substantiation for Public Input

Currently there are no listings for fire extinguisher or UL test standard, but you will see companies that say that their product can be used a fire Lithium and other technologies batteries.

The big question is what class of fire is a lithium battery event? We know there may be some DC electric charge on the unit, we may have toxic, flammable/combustible gases released during an event where a battery is damaged or abused. Some folks may even say that it is a combustible metal fire.

By making a new class we can educate all parties on the true hazards of these types of batteries, the class of fire and develop ne UL standards for extinguisher that are used on their batteries.

I understand that I may be missing some data and other code section, but I develop the committee should review the issue related to fire extinguisher use on battery fires and determine the correct testing, listing and location to protect this hazard.

We know the hazard is real at single family homes, apartments, offices, business, and other occupancies.

There has been multiple reports of these types of fires that resulted in injuries and even deaths.

I would recommend that the committee have a working group to determine what is best for this type of event, to determine a new class of fire or exclude portable fire extinguisher from the scope of work for lithium and other technologies batteries.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 69-NFPA 10-2023 [New Section after 5.2.5]	same subject

Submitter Information Verification

Submitter Full Name: Joe McElvaney
Organization: The Hiller Companies
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 12 11:52:36 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that

hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L and Class T have also not been incorporated for these reasons.

Public Input No. 2-NFPA 10-2021 [New Section after 5.5.5.1]

Fire Extinguisher Use

The employer shall prepare and issue an Organizational Statement in accordance with NFPA 600 which defines the roles, expectations and training for any person required or expected to Fight a Fire with a Fire Extinguisher.

Statement of Problem and Substantiation for Public Input

Its one thing to provide and have fire extinguishers, but it is another to Fight a Fire. By directing NFPA 10 to NFPA 600, the employer will be able to clarify and outline the expectations for Fire Fighting.

Submitter Information Verification

Submitter Full Name: Matthew Heafey
Organization: BCH
Street Address:
City:
State:
Zip:
Submittal Date: Thu Nov 04 14:04:39 EDT 2021
Committee: PFE-AAA

Committee Statement

Resolution: This revision has not been adopted since fire brigade requirements are outside the scope of NFPA 10, see section 1.2. NFPA 1081 is the document that covers the training of fire brigades.

Public Input No. 19-NFPA 10-2022 [Section No. 5.5.5.1]

5.5.5.1*

Where portable fire extinguishers are required to be installed, the following documents shall be reviewed for the occupancies outlined in their respective scopes:

(1) NFPA 1
(2) NFPA 2
(3) ~~NFPA 22~~ DELETE NFPA 22
(4) NFPA 30
(5) NFPA 30A
(6) NFPA 33
(7) NFPA 40
(8) NFPA 45
(9) NFPA 51
(10) NFPA 51B
(11) NFPA 52
(12) NFPA 58
(13) NFPA 59
(14) NFPA 59A
(15) *NFPA 72*
(16) NFPA 75
(17) NFPA 76
(18) NFPA 96
(19) NFPA 99
(20) NFPA 99B
(21) NFPA *101*
(22) NFPA 102
(23) NFPA 115
(24) NFPA 120
(25) NFPA 122
(26) NFPA 130
(27) NFPA 140
(28) NFPA 150
(29) NFPA 160
(30) NFPA 232
(31) NFPA 241
(32) NFPA 301
(33) NFPA 302
(34) NFPA 303
(35) NFPA 307
(36) NFPA 326
(37) NFPA 385
(38) NFPA 400
(39) NFPA 403
(40) NFPA 407
(41) NFPA 408
(42) NFPA 409
(43) NFPA 410

(44) NFPA 418
(45) NFPA 423
(46) NFPA 484
(47) NFPA 495
(48) NFPA 498
(49) NFPA 501A
(50) NFPA 502
(51) NFPA 505
(52) NFPA 655
(53) NFPA 731
(54) NFPA 801
(55) NFPA 804
(56) NFPA 805
(57) NFPA 820
(58) NFPA 909
(59) NFPA 914
(60) NFPA 1123
(61) NFPA 1125
(62) NFPA 1126
(63) NFPA 1141
(64) NFPA 1192
(65) NFPA 1194
(66) NFPA 1221
(67) NFPA 1901
(68) NFPA 1906
(69) NFPA 1925
(70) *NFPA 5000*

Statement of Problem and Substantiation for Public Input

NFPA 22-2023 Edition contains no language or guidance on the selection, placement, or distribution of portable fire extinguishers. A search of the document found zero matches for the phrase 'fire extinguisher' or 'extinguisher'. As written NFPA 10 is directing users to a document which provides no guidance or information to make an informed portable fire extinguisher decision. If NFPA 10 believes portable fire extinguishers in / at fire protection water tanks are necessary then it should develop direct language in the body of NFPA 10 to provide users with clear guidance.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 21-NFPA 10-2022 [Global Input]	

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township - Code Enforcement
Affiliation:	Friend of the Codes - Not Representing Any Entity, Group, or Special Interest.
Street Address:	
City:	

State:
Zip:
Submittal Date: Fri May 20 09:15:23 EDT 2022
Committee: PFE-AAA

Committee Statement

Resolution: FR-40-NFPA 10-2023
Statement: Reference to NFPA 22 has been removed since it does not have extinguisher call outs. All other NFPA references have been removed, or added, due to consolidation into other NFPA documents.

Public Input No. 20-NFPA 10-2022 [Section No. 5.5.5.1]

5.5.5.1*

Where portable fire extinguishers are required to be installed, the following documents shall be reviewed for the occupancies outlined in their respective scopes:

(1) NFPA 1

(2) NFPA 2

(3) NFPA 22

(4) NFPA 30

(5) NFPA 30A

(6) ~~NFPA 33~~
~~NFPA 40~~

(7) DELETE NFPA 33

(8) DELETE NFPA 40

(9) NFPA 45

(10) NFPA 51

(11) ~~NFPA 51B~~ DELETE NFPA 51B

(12) NFPA 52

(13) NFPA 58

(14) NFPA 59

(15) NFPA 59A

(16) *NFPA 72*

(17) NFPA 75

(18) NFPA 76

(19) NFPA 96

(20) NFPA 99

(21) NFPA 99B

(22) NFPA *101*

(23) NFPA 102

(24) NFPA 115

(25) NFPA 120

(26) NFPA 122

(27) NFPA 130

(28) NFPA 140

(29) NFPA 150

(30) NFPA 160

(31) NFPA 232

(32) NFPA 241

(33) NFPA 301

(34) NFPA 302

(35) NFPA 303

(36) NFPA 307

(37) NFPA 326

(38) NFPA 385

(39) NFPA 400

(40) NFPA 403

(41) NFPA 407

(42) NFPA 408

(43) NFPA 409
(44) NFPA 410
(45) NFPA 418
(46) NFPA 423
(47) NFPA 484
(48) NFPA 495
(49) NFPA 498
(50) NFPA 501A
(51) NFPA 502
(52) NFPA 505
(53) NFPA 655
(54) NFPA 731
(55) NFPA 801
(56) NFPA 804
(57) NFPA 805
(58) NFPA 820
(59) NFPA 909
(60) NFPA 914
(61) NFPA 1123
(62) NFPA 1125
(63) NFPA 1126
(64) NFPA 1141
(65) NFPA 1192
(66) NFPA 1194
(67) NFPA 1221
(68) NFPA 1901
(69) NFPA 1906
(70) NFPA 1925
(71) *NFPA 5000*

Statement of Problem and Substantiation for Public Input

NFPA 33-2021, NFPA 40-2022, & NFPA 51-B 2019 all contain references to NFPA 10 for the selection, placement, and distribution of portable fire extinguishers. There is no specific guidance or criteria in any of those three standards which provide a code user assistance or guidance to make informed portable fire extinguisher decisions. This means NFPA 10 is sending users facing those example hazards or occupancies to the specific standard only to find out that those standards send the user back to NFPA 10. As written these are all examples of circular code pathways which provide no usable information or guidance in the ultimate mission of portable fire extinguisher selection, placement, or distribution. Either NFPA 10 should fill this hole with specific language or it should delete the cross reference to a circular pathway.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 21-NFPA 10-2022 [Global Input]	

Submitter Information Verification

Submitter Full Name: David Phelan

Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Organization, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Fri May 20 09:22:13 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: FR-40-NFPA 10-2023

Statement: Reference to NFPA 22 has been removed since it does not have extinguisher call outs. All other NFPA references have been removed, or added, due to consolidation into other NFPA documents.

Public Input No. 22-NFPA 10-2022 [Section No. 5.5.5.2]

5.5.5.2

~~In no case shall the requirements of the documents in~~ 5.5.5.1 ~~be less than those specified in this standard.~~ DELETE

Statement of Problem and Substantiation for Public Input

As written 5.5.5.2 has no mechanism for enforcement nor is there any established process by which another TC that is considering portable fire extinguisher language is required to review, consider, or consult with NFPA 10 to ensure they are not creating language in their standard which is less restrictive or provides a lesser degree of protection than what NFPA 10 may contain. As a result, TC's operate independently of NFPA 10 and this particular requirement with the end result being a code 'requirement' that is not being upheld in spirit or protocol. Based on the history of such conflicting standards operating independently of 5.5.5.2 it should simply be deleted from NFPA 10 so as to not cause a future problem for someone who may in fact be complying with a PFE requirement in another standard while unknowingly violating NFPA 10. If there is not going to be any correlation or enforcement as part of the development process by or through NFPA then the end users should not be subject to future penalty or harm simply by following one NFPA code or standard and not being aware of the other, more restrictive language, in NFPA 10.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 36-NFPA 10-2022 [New Section after A.5.5.5.1]	
Public Input No. 36-NFPA 10-2022 [New Section after A.5.5.5.1]	

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Organization, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Fri May 20 09:40:17 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: The requirements given in NFPA 10 are a minimum, see 1.1.1. Where other NFPA standards reference the requirements of NFPA 10 in whole or in part does not imply a conflict. The submitter has also not identified existing conflicts between NFPA 10 and other NFPA documents, which would facilitate the need of a change to this section.

Public Input No. 23-NFPA 10-2022 [New Section after 6.1.3.9.3]

6.1.3.9.4 NEW SECTION

Where portable fire extinguishers are installed in corridors, walkways, passageways, or aisles which form an accessible route or accessible circulation path and the bottom of the installed fire extinguisher is between 27-inches and 80-inches above the finished floor there shall be no part of the extinguisher, bracket, or cabinet which protrudes more than 4-inches from the wall.

PROPOSED ANNEX MATERIAL TO NEW 6.1.3.9.4

This requirement in NFPA 10 addresses projections which can pose an interference to persons using various mobility aids and directly imports the requirements in the Americans with Disabilities Act and the ANSI A117 Barrier Free Code. Since a portable fire extinguisher could present an interference issue it is important that persons who install them understand that compliance with NFPA 10 and accessibility requirements may be necessary depending on the specific installation location. This language in NFPA 10 mirrors the requirements in both the Americans with Disabilities Act and the ANSI A117 Barrier Free Code.

Statement of Problem and Substantiation for Public Input

The installation of portable fire extinguishers could unintentionally trigger non-compliance for projections along various routes or pathways which are required to be accessible for persons using mobility aids. The language in this input places the relevant information from the two prevailing accessibility codes into NFPA 10 to ensure that installers, owners, and code officials are aware of and complying with this critical 'non-fire-extinguisher code' requirement. Field experience continues to show that this type of installation conflicts occur and despite efforts to publicize the requirement and provide support materials many installers and owners remain unaware of the requirement since it isn't contained in the 'fire extinguisher code' they are typically familiar with.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Sat May 21 08:28:39 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: NFPA 10 provides minimum requirements for fire extinguishers and any additional ADA code requirements that are more prescriptive should not be adopted into NFPA 10. Other NFPA documents also already cover the ADA concern such as NFPA 101. Additionally, language cannot be lifted directly from other documents outside of NFPA. Any requirements from another standard developer must be adopted by reference.

Public Input No. 24-NFPA 10-2022 [Sections 6.1.3.11.1.1, 6.1.3.11.1.2]

Sections 6.1.3.11.1.1, 6.1.3.11.1.~~2~~ 2 CHANGE TITLE TO 'CABINETS' - Delete 'Locked'

6.1.3.11.1.1

Cabinets housing fire extinguishers shall not be locked, except where fire extinguishers are subject to malicious use or theft and the cabinets include a means of emergency access. Locking of cabinets shall be approved by the Authority Having Jurisdiction.

6.1.3.11.1.2 NEW

Cabinets shall not be fitted, equipped, or modified with locking devices except as provided or specified by the cabinet manufacturer.

6.1.3.11.1.2

Cabinets housing fire extinguishers with break-front panels shall be provided with breaker bars ~~or~~ , hammers, or another device provided by the cabinet manufacturer and designed for accessing the extinguisher during a fire emergency.

6.1.3.11.1.3

Cabinets housing fire extinguishers shall be sized to accommodate the intended extinguisher with adequate clearance around the top and sides of the extinguisher to ensure immediate access and retrieval using two hands simultaneously.

6.1.3.11.1.4

Where cabinets are equipped with local sounders or door alarms they shall not interfere with access or removal of the fire extinguisher as described in 6.1.3.11.1.3.

Statement of Problem and Substantiation for Public Input

The new language regarding clearance around the extinguisher and cabinet was previously located in the Annex. The reality is that when extinguishers are installed in cabinets there needs to be adequate clearance for a novice to react and anxiously grab a fire extinguisher in a worst-case two handed grab and run fashion. That needs to be a clear code requirement, not a suggestion in an Annex. The title of the section is revised to reflect it applies to all cabinets, not just those which may be locked. Lastly, the revisions prevent the field installation or modification of a cabinet to lock using common methods like a padlock & hasp or slide bolt. Modification of a cabinet to accommodate such improvised locking methods could impair break-front operation, restrict removal through the opening, or compromise the integrity and rating of a fire-resistance rated extinguisher cabinet. Similarly the means to operate a break-front cabinet must be what the cabinet manufacturer provides, not a field-substitution of a long carriage bolt, heavy lug nut, or a recent favorite.... just pick up a rock from the gravel driveway and throw it.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 47-NFPA 10-2022 [Section No. A.6.1.3.11]	
Public Input No. 47-NFPA 10-2022 [Section No. A.6.1.3.11]	

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	

Submittal Date: Sat May 21 08:51:22 EDT 2022
Committee: PFE-AAA

Committee Statement

Resolution: All requirements in NFPA 10 must align with the approval of the authorities having jurisdiction and adding such language is not needed. NFPA 10 is a selection, maintenance, and installation document. The annex of 6.1.3.11 adequately covers the proposed new section of 6.1.3.11.1.3 without making requirements on the manufacturing of cabinets which is outside the scope of NFPA 10.

Public Input No. 35-NFPA 10-2022 [New Section after 6.1.3.11.1.2]

6.1.3.11.1.3 (May Not Be Correct But Belongs in 6.1.3.11 Somewhere)

Non-locking fire extinguisher cabinets shall be openable by a handle, knob, lever, or other device which can be operated with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

Statement of Problem and Substantiation for Public Input

This language imports the existing ANSI A117 Barrier Free Code and Americans with Disabilities Act language covering operable parts of built-in storage cabinets and ensures that the means to access a fire extinguisher cabinet is compliant with those codes and affords a person with a disability the intended access to a fire extinguisher cabinet the same as any other person. This topic is currently pending a written interpretation from the ICC's Barrier Free Committee and a similar interpretation is being sought under the Americans with Disabilities Act. While these are not available for inclusion or attachment to this PI it is anticipated that they will be available in time for the first meeting so as to be reviewed and considered by the entire Committee.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 17:36:38 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: This is extracted from other documents that are more prescriptive than NFPA 10. NFPA 10 provides only minimum requirements for fire extinguishers and does not prevent more stringent codes from being implemented. Additionally, language can not be lifted from other codes, standards, or documents from another organizations. To adopt language from another organization must be done so by reference. Additionally, terms like tight grasping, pinching, and twisting are difficult to enforce.

Public Input No. 34-NFPA 10-2022 [Section No. 6.1.3.11.1.2]

6.1.3.11.1.2

Cabinets housing fire extinguishers with break-front panels shall be provided with breaker bars or hammers, designed for accessing the extinguisher during a fire emergency.

6.1.3.11.1.3

Tools provided to operare a break-front extinguisher cabinet must be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist to effectively clear the break-front panel and have access to the fire extingusher.

Statement of Problem and Substantiation for Public Input

This language imports the existing ANSI A117 Barrier Free Code and Americans with Disabilities Act language covering operable parts of built-in storage cabinets and ensures that the means to access a locked fire extinguisher is compliant with those codes and affords a person with a disability the intended access to a locked fire extinguisher as any other person. This topic is currently pending a written interpretation from the ICC's Barrier Free Committee and a similar interpretation is being sought under the Americans with Disabilities Act. While these are not available for inclusion or attachment to this PI it is anticipated that they will be available in time for the first meeting so as to be reviewed and considered by the entire Committee.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing any Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 17:25:56 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: This is extracted from other documents that are more prescriptive than NFPA 10. NFPA 10 provides only minimum requirements for fire extinguishers and does not prevent more stringent codes from being implemented. Additionally, language can not be lifted from other codes, standards, or documents from another organizations. To adopt language from another organization must be done so by reference. Additionally, terms like tight grasping, pinching, and twisting are difficult to enforce.

Public Input No. 42-NFPA 10-2022 [Section No. 6.1.3.11.6.1]

6.1.3.11.6.1

~~The~~
Listed fire resistance rated cabinets shall be installed in accordance with the cabinet manufacturer's installation instructions.

6.1.3.11.6.2 Listed fire resistance rated cabinets shall not be field-modified to accommodate local conditions without the written approval of the cabinet manufacturer.

6.1.3.11.6.3 Listed fire resistance rated cabinets shall not diminish the structural integrity or load carrying capability of the fire or smoke rated assembly.

6.1.3.11.6.4 The provisions of 6.1.3.11.6 shall not apply to existing fire resistance rated cabinet installations previously approved by the AHJ .

Statement of Problem and Substantiation for Public Input

The installation of a fire resistance rated cabinet in a fire resistant or smoke protected assembly requires strict conformity with the manufacturer's instructions and may not negatively impact the load carrying ability of the assembly. The cabinet must not be field modified to solve a fit or finish issue. These are all critical elements of protecting the rated assembly yet NFPA 10 does not have language to uphold such when a fire resistance rated cabinet is installed in a protected assembly.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 18:35:52 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: Any field-modification would violate the listing of the cabinet.

Public Input No. 194-NFPA 10-2023 [New Section after 6.2.1.2.2]

6.2.1.2.3

In storage areas of Group S Occupancies where forklift, powered industrial truck, or powered cart operators are the primary occupants, fixed extinguishers shall not be required where in accordance with all of the following:

(1) Use of vehicle-mounted extinguishers shall be approved by the fire code official.

(2) Each vehicle shall be equipped with a 10-pound, 40A:80B:C extinguisher affixed to the vehicle using a mounting bracket approved by the extinguisher manufacturer or the fire code official for vehicular use.

(3) Not less than two spare extinguishers of equal or greater rating shall be available on site to replace a discharged extinguisher.

(4) Vehicle operators shall be trained in the proper operation, use, and inspection of extinguishers.

(5) Inspections of vehicle-mounted extinguishers shall be performed daily.

Statement of Problem and Substantiation for Public Input

New warehouses are being built larger with racking systems that create aisles much longer than the required distance to reach a fire extinguisher, even when an extinguisher is installed on each end of the aisle. Oftentimes, there is no location for an extinguisher to be installed in the middle of an aisle. It is not uncommon to see continuous aisle lengths up to 300-450 ft in new warehouses. As an example, even an aisle with a length of 180 ft would require an extinguisher on either end of the aisle as well as an extinguisher in the middle of the aisle, totaling 3 extinguishers per aisle, to meet the travel distance requirement. When this number is multiplied by the number of aisles in the warehouse, the number of extinguishers adds up very quickly. The number of extinguishers needed to meet the travel distance requirements also is difficult for employees to inspect and maintain regularly. Additionally, there is always concern when installing extinguishers in the middle of an aisle that they will be struck by the vehicles using the aisles. It is becoming more common to attach extinguishers to vehicles in order to ensure that an employee always has access to an extinguisher. The above requirements were taken from Section 906.1.1.3.1 through 906.1.1.3.5 of the 2021 Edition of the International Building Code.

Submitter Information Verification

Submitter Full Name: Claire Brezinski
Organization: The FPI Consortium, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 31 15:27:48 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Some of this language is pulled from a document that supersedes NFPA 10. NFPA 10 does not determine what occupancies require fire extinguishers. Additionally, loading fire extinguishers on vehicles would put fire extinguishers in unknown locations in any given time.

Public Input No. 126-NFPA 10-2023 [Section No. 6.3.1.1.2]

6.3.1.1.2

Up to three ~~AFFF or FFFP~~ AFFF , FFFP or Encapsulator Agent (EA) fire extinguishers of at least 2½ gal (9.46 L) capacity shall be permitted to be used to fulfill extra hazard requirements.

Statement of Problem and Substantiation for Public Input

Added language for Encapulator Agenet being an acceptable agent for these types of hazards.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 07:04:25 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The term “encapsulator agent” should be defined in NFPA 18A if it is an appropriate term to be defined, as it is a water additive. NFPA 10 does not define the agent but, rather, provide the requirements for types of extinguishers associated with classification of fire (Class A, B, etc.). Additionally, the term "encapsulator agent" does not appear in NFPA 10 and can therefore not be added to Chapter 3.

Public Input No. 85-NFPA 10-2023 [Section No. 6.3.1.1.2]

6.3.1.1.2

Up to three ~~AFFF or FFFP~~ foam fire extinguishers of at least $2^{1}/$~~2~~ ~~gal~~ .5 gal (9.46 L) capacity shall be permitted to be used to fulfill extra hazard requirements.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:40:49 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-9-NFPA 10-2023
Statement: There are several different types of foam fire extinguishers listed and labeled for this type of application. This revision covers all listed and labeled foam fire extinguishers. The section has been moved to be a subsection to 6.3.1.1.1.

Public Input No. 128-NFPA 10-2023 [Section No. 6.3.1.1.3]

6.3.1.1.3

Two AFFF ~~or FFFP~~ , FFP or Encapsulator Agent (EA) fire extinguishers of at least 1.6 gal (6 L) capacity shall be permitted to be used to fulfill ordinary hazard requirements.

Statement of Problem and Substantiation for Public Input

Added language to add Encapsulator Agents (EA) as an acceptable agent for these types of hazards.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 07:31:34 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: There is insufficient information to support including encapsulator agent for ordinary hazard requirements.

Public Input No. 86-NFPA 10-2023 [Section No. 6.3.1.1.3]

6.3.1.1.3

Two ~~AFFF or FFFP fire~~ foam fire extinguishers of at least 1.6 gal (6 L) capacity shall be permitted to be used to fulfill ordinary hazard requirements.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:44:32 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-10-NFPA 10-2023
Statement: There are several different types of foam fire extinguishers listed and labeled for this type of application. This revision covers all listed and labeled foam fire extinguishers. This section has also been updated to be a subsection of 6.3.1.1.1.

Public Input No. 129-NFPA 10-2023 [Section No. 6.3.2.3]

6.3.2.3

AFFF-~~ or FFFP~~ , FFFP-, or Encapsulator Agent (EA) - type fire extinguishers shall be permitted to be provided on the basis of 1-B of protection per 1 ft^2 (0.09 m^2) of hazard. *(For fires involving water-soluble flammable liquids, see 5.5.4.4.)*

Statement of Problem and Substantiation for Public Input

Added language to add Encapsulator Agents (EA) as an acceptable agent for these types of hazards.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 07:32:30 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: There are currently no listed fire extinguishers that use an encapsulator agent and therefore cannot be adopted into NFPA 10.

Public Input No. 87-NFPA 10-2023 [Section No. 6.3.2.3]

6.3.2.3

~~AFFF- or FFFP-type~~ Foam fire extinguishers shall be permitted to be provided on the basis of 1-B of protection per 1 ft^2 (0.09 m^2) of hazard. *(For fires involving water-soluble flammable liquids, see 5.5.4.4.)*

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:46:02 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-11-NFPA 10-2023
Statement: There are several different types of foam fire extinguishers listed and labeled for this type of application. This revision covers all listed and labeled foam fire extinguishers.

Public Input No. 88-NFPA 10-2023 [Section No. 6.3.2.3]

6.3.2.3

~~AFFF- or FFFP-type~~ Foam fire extinguishers shall be permitted to be provided on the basis of 1-B of protection per 1 ft^2 (0.09 m^2) of hazard. *(For fires involving water-soluble flammable liquids, see 5.5.4.4.)*

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:47:16 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-11-NFPA 10-2023
Statement: There are several different types of foam fire extinguishers listed and labeled for this type of application. This revision covers all listed and labeled foam fire extinguishers.

Public Input No. 130-NFPA 10-2023 [Section No. 6.3.2.4]

6.3.2.4

Two or more fire extinguishers of lower ratings, other than AFFF-~~ or~~ , FFFP-, Encapsulator Agent (EA)- type fire extinguishers, shall not be used in lieu of the fire extinguisher required for the largest hazard area.

Statement of Problem and Substantiation for Public Input

Added language to add Encapsulator Agents (EA) as an acceptable agent for these types of hazards.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 07:33:16 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: There are currently no listed fire extinguishers that use an encapsulator agent and therefore cannot be adopted into NFPA 10.

Public Input No. 89-NFPA 10-2023 [Section No. 6.3.2.4]

6.3.2.4

Two or more fire extinguishers of lower ratings, other than ~~AFFF- or FFFP-type fire~~ foam fire extinguishers, shall not be used in lieu of the fire extinguisher required for the largest hazard area.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:48:32 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-12-NFPA 10-2023
Statement: There are several different types of foam fire extinguishers listed and labeled for this type of application. This revision covers all listed and labeled foam fire extinguishers.

Public Input No. 131-NFPA 10-2023 [Section No. 6.3.2.5]

6.3.2.5

Up to three AFFF-~~ or~~ , FFFP-, Encapsulator Agent (EA)- type fire extinguishers shall be permitted to fulfill the requirements, provided the sum of the Class B ratings meets or exceeds the value required for the largest hazard area.

Statement of Problem and Substantiation for Public Input

Added language to add Encapsulator Agents (EA) as an acceptable agent for these types of hazards.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 07:33:49 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: There are currently no listed fire extinguishers that use an encapsulator agent and therefore cannot be adopted into NFPA 10.

Public Input No. 90-NFPA 10-2023 [Section No. 6.3.2.5]

6.3.2.5

Up to three ~~AFFF- or FFFP-type fire~~ foam fire extinguishers shall be permitted to fulfill the requirements, provided the sum of the Class B ratings meets or exceeds the value required for the largest hazard area.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:49:52 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-13-NFPA 10-2023
Statement: There are several different types of foam fire extinguishers listed and labeled for this type of application. This revision covers all listed and labeled foam fire extinguishers.

Public Input No. 144-NFPA 10-2023 [New Section after 6.6]

6.7 Installations for Class L Hazards.

6.7.1 * _

Class L fire extinguishers shall be provided for hazards where there is a potential for fires involving Lithium Ion batteries such as tablets, laptops, mobile phones, e-bikes, e-scooters and other micro-mobility devices.

6.7.2

Maximum travel distance shall not exceed 30 ft (9.1 m) from the hazard to the extinguishers.

..

Statement of Problem and Substantiation for Public Input

Added language to add Class L hazard locations definition.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 62-NFPA 10-2023 [New Section after 5.2.5]	Definition

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 10:55:41 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 182-NFPA 10-2023 [New Section after 6.6]

6.7 Installations for Class L Hazards

Statement of Problem and Substantiation for Public Input

With the addition of Class L fires, the installation requirements of extinguishers for the protection of Class L hazards must be defined. These requirements will be defined within the new Section 6.7. This input provides the new heading for this section.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of the new Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 19:20:10 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 183-NFPA 10-2023 [New Section after 6.6]

6.7.1

Fire extinguishers or extinguishing agents with Class L ratings shall be provided where there is a potential for fires involving energized lithium-based energy storage batteries, including batteries in equipment or vehicles.

Statement of Problem and Substantiation for Public Input

Extinguishers for each fire class are required to have the correct rating relative to the hazard. This section was added to require that provided fire extinguishers contain agent that is adequate to protect the specified Class L hazard.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of the Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Asociates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 19:25:10 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 184-NFPA 10-2023 [New Section after 6.6]

6.7.2

Fire extinguishers or extinguishing agents shall be located not more than 75 ft (22.9 m) of travel distance from the Class L hazard. (See Section E.8.)

Statement of Problem and Substantiation for Public Input

This section was added to define the maximum travel distance of fire extinguishers to Class L hazards. The proposed maximum travel distance is based on that for Class D fires which can also produce fast growing, high temperature fires. This is also the maximum travel distance allowed for any type of extinguisher. This is subject to change based on results of develpoing certification standards.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of the Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 19:35:44 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 185-NFPA 10-2023 [New Section after 6.6]

6.7.3

Size or number of extinguishers shall be determined on the basis of the specific hazard including the quantity and capacity of lithium batteries, area to be covered, and recommendations by the fire extinguisher manufacturer based on data from control tests.

Statement of Problem and Substantiation for Public Input

Without results from standard tests to gauge fire extinguisher performance on Class L hazards, the manufacturer of extinguishers for Class L fires should provide specific guidance on extinguisher distribution. Therefore this seciton specifies that the size or number of fire extinguishers required to protect these hazards will depend on the specific installation and guidance from the extinguisher manufacturer based on tests they have performed. This language is similar to that for the protection of Class D hazards.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 19:38:45 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 72-NFPA 10-2023 [New Section after 6.6]

6.6 Installations for Class T Hazards.

6.6.1* -

Fire extinguishers or extinguishing agents with Class T ratings shall be provided for fires involving combustible metals.

6.6.2

Fire extinguishers or extinguishing agents (media) shall be located not more than 75 ft (22.9 m) of travel distance from the Class T hazard.

6.6.3* -

Portable fire extinguishers or extinguishing agents (media) for Class T hazards shall be provided in those areas where lithium batteries or other battery technologies are used, stored or handled.

6.6.4* -

Size determination shall be on the basis of the specific battery types, size, charge, area to be covered, and recommendations by the fire extinguisher manufacturer based on data from control tests.

Statement of Problem and Substantiation for Public Input

Currently there are no listings for fire extinguisher or UL test standard, but you will see companies that say that their product can be used a fire Lithium and other technologies batteries.

The big question is what class of fire is a lithium battery event? We know there may be some DC electric charge on the unit, we may have toxic, flammable/combustible gases released during an event where a battery is damaged or abused. Some folks may even say that it is a combustible metal fire.

By making a new class we can educate all parties on the true hazards of these types of batteries, the class of fire and develop ne UL standards for extinguisher that are used on their batteries.

I understand that I may be missing some data and other code section, but I develop the committee should review the issue related to fire extinguisher use on battery fires and determine the correct testing, listing and location to protect this hazard.

We know the hazard is real at single family homes, apartments, offices, business, and other occupancies.

There has been multiple reports of these types of fires that resulted in injuries and even deaths.

I would recommend that the committee have a working group to determine what is best for this type of event, to determine a new class of fire or exclude portable fire extinguisher from the scope of work for lithium and other technologies batteries.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 69-NFPA 10-2023 [New Section after 5.2.5]	
Public Input No. 71-NFPA 10-2023 [New Section after 5.3.2.5]	

Submitter Information Verification

Submitter Full Name: Joe McElvaney

Organization: The Hiller Companies
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 12 12:08:59 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class T has not been incorporated for these reasons.

Public Input No. 26-NFPA 10-2022 [Section No. 6.6.2]

6.6.2

~~Maximum travel distance shall not exceed 30 ft (9.1 m) from the hazard to the extinguishers.~~

Class K portable fire extinguishers shall be located in the path of egress from the cooking hazard but not less than 10-feet or more than 20-feet from the hazard. This applies to temporary and permanently installed cooking hazards.

6.6.2.1.

Where a cooking hazard is protected by a fixed fire extinguishing system, a placard shall be conspicuously posted near the Class K portable fire extinguisher that states the fixed fire protection system shall be actuated prior to using the fire extinguisher.

6.6.2.2

The Class K portable fire extinguisher and placard required by 6.6.2.1 shall be conspicuously located and within reach of the manual activator for the fire extinguishing system, if a manual activator is present.

6.6.2.3

The Authority Having Jurisdiction is permitted to modify the travel distance and location requirement of the Class K portable fire extinguisher required in 6.6.2 and 6.6.2.2 based on site conditions.

Statement of Problem and Substantiation for Public Input

It is well understood that the Class K extinguisher is a secondary fire fighting element when fixed extinguishing systems are present and the standing requirement for the instruction placard is meant to reinforce this to a novice user under the heat of the moment. The placard requirement was relocated from 5.5.5.3 into Chapter 6 since the placard is an installation requirement and not an extinguisher selection requirement. The changes to extinguisher travel distance and location relative to the manual activator (if present) is intended to bring harmony to installations. NFPA 17-A (wet chemical) does not require a Class K portable extinguisher nor does it even reference to NFPA 10. Likewise NFPA 10 always had general and broad language about installing extinguishers in path of travel (6.1.3.2) but never clearly tied this to a path of egress from a kitchen or cooking area. This new clear language places all of the relevant installation language for Class K extinguishers into one single place within NFPA 10. It also brings together the two necessary elements of the fixed system manual activator and the portable extinguisher & placard. It makes little sense to put a placard with the extinguisher that says go do this first (pull manual activator) before using Class K extinguisher if the person (novice employee) then has to go hunt around for the 4-inch diameter metal pull ring somewhere on the wall. FYI - NFPA 17-A & NFPA 5000 do not specify a location for the manual activator other than requiring it be readily accessible in the path of egress (no distance rules in 17-A 5.2.1.10) unless modified by the AHJ. NFPA 17-A does have Annex material which describes the location of the manual activator as 10-20 feet from the cooking hazard. The global model fire and building codes already require that the manual activator be located between 10-20 feet from the hazard so as to be relatively safe from the immediate hazard while the employee is moving towards the exit. In total these changes harmonize NFPA 10, 17-A, 5000, and the global model codes with regard to where the manual activator is installed and that the Class K extinguisher and placard are also co-located in the same immediate vicinity to afford the best possible outcome from a novice user responding to a cooking fire event.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing and Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Sat May 21 09:49:12 EDT 2022

Committee: PFE-AAA

Committee Statement

Resolution: The first proposed statement has been removed from NFPA 96 and would not be appropriate to adopt into NFPA 10 as this would conflict with many kitchen configurations. There is already an NFPA 10 placard requirement, see 5.5.4.5.3. AHJs needs to refer back to NFPA 96 when modifying the travel distance and location requirements of extinguishers near cooking hazards.

Public Input No. 27-NFPA 10-2022 [Section No. 6.7]

6.7 Solid-Fuel Cooking Appliances.

All solid-fuel cooking ~~appliances (~~ operations, whether temporary or ~~not~~ permanent, or under a hood ~~) with fire boxes~~ or not, with a total fire box(s) volume of 5 ft^3 (0.14 m^3) ~~volume or~~ or less shall ~~have at least a~~ be provided with a minimum of a listed 2-A-rated water-type fire extinguisher or a 1.6 gal (6 L) wet-chemical fire extinguisher that is listed for Class K fires. A single portable fire extinguisher rated 2A:K is also suitable for meeting this requirement.

6.7.1

All solid-fuel cooking operations, whether temporary or permanent, or under a hood or not, with a total fire box(s) volume greater than 5 ft^3 (0.14 m^3) volume shall be provided with a minimum 1.6 gal (6L) Class K portable fire extinguisher and shall also comply with the hose protection requirements of NFPA 96 Section 14.7.9.

6.7.2

Portable fire extinguishers installed to comply with this section shall be placed no less than 10-feet nor more than 20-feet from the hazard(s) they protect.

6.7.2.1

Portable fire extinguishers are permitted to cover multiple solid fuel cooking hazards provided they comply with 6.7.2.

Statement of Problem and Substantiation for Public Input

At present the NFPA 10 solid fuel language only applies to 'appliances' and that is a very specific term which can fail to capture the total breadth of solid fuel cooking operations, often which are in open pits, drums, or other containers which are not appliances. We are addressing the hazard of the operation, whether that be a single firebox appliance, drum, pit, grill, etc. or a permanent cookline in a building with multiple solid fuel cooking devices. NFPA 10 also only has language when the solid fuel firebox is less than 5 ft3 without clarifying if that is per single cooking device or in the aggregate of multiple solid fuel cooking devices. It also does not provide any requirements nor guidance for how to address a solid fuel cooking operation which has a total of more than 5ft3 of solid fuel pit(s), leaving a big hole to be filled without any guidance. While NFPA 96 does contain language for more than 5ft3 there is no direct pathway to it from the solid fuel section and it relies on the user to have access to a second code document which is not always adopted or referenced by the AHJ. These changes collectively bring NFPA 10 to the level where it addresses all related requirements for solid fuel protection without relying on external documents or potentially not adopted other standards. Despite what many believe NFPA 96 is not as widely adopted or referenced as it once was given the rise in prominence of the global mechanical and fire codes which no longer externally reference NFPA 96 for all solid fuel matters. Lastly, there is proposed placement and travel distance guidance given which correlates to manual activator locations for fixed systems as well as when temporary or outdoor cooking operations occur.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Sat May 21 10:02:37 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: NFPA 10 provides minimum requirements for portable fire extinguishers. NFPA 96 needs to be followed when it has more restrictive requirement for cooking hazards, which is outside the scope of NFPA 10.

Public Input No. 45-NFPA 10-2022 [New Section after 7.1.4.2]

7.1.4.3
Field applied labels or stickers which are directly affixed to the extinguisher cylinder shall not be located on the front face in the 120-degree area measured as 60-degrees left and 60-degrees right of the cylinder centerline.

Statement of Problem and Substantiation for Public Input

The UL standards for dry chem, water based, and CO2 extinguishers reserve the front face of the extinguisher cylinder for the required pictograms, instructions, and
text necessary to inform a novice user as to extinguisher deployment. These requirements are specifically to prohibit and eliminate extraneous information which could
confuse or confound a novice user under emergency conditions. The 120-degree area language is imported directly from the UL standards and by placing it in Chapter 7 it would make the requirement to uphold the original installation requirements in 6.1.3.10 enforceable as part of ongoing inspection and maintenance. At present NFPA 10 has original installation language in Chapter 6 (6.1.3.10) to regulate this practice but NFPA 10 lacks anything which could be cited for an existing installation as part of the periodic inspection cycle. Commonly found field conditions include service provider advertisement, inventory barcodes, location name / numbers, and anti-tamper/theft warnings.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 19:21:20 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: The adoption of this language would conflict with 6.1.3.6.10.3. Additionally, language cannot be lifted directly from other documents outside of NFPA. Any requirements from another standard developer must be adopted by reference.

Public Input No. 169-NFPA 10-2023 [Section No. 7.2.1]

7.2.1 Inspection Frequency.

7.2.1.1*

Fire extinguishers shall be manually inspected when initially placed in service.

7.2.1.2*

Fire extinguishers and Class D extinguishing agents shall be inspected either manually or by means of an electronic monitoring device/system at intervals not exceeding 31 days, except in buildings containing a hospital, where the interval shall be quarterly .

7.2.1.2.1

Fire extinguishers and Class D extinguishing agents shall be inspected at least once per calendar month, except in buildings containing a hospital, where the interval shall be quarterly .

7.2.1.3*

Fire extinguishers and Class D extinguishing agents shall be manually inspected daily, weekly, or ~~weekly~~ monthly when conditions exist that indicate the need for more frequent inspections.

7.2.1.4

Extinguishers that are electronically monitored for location only, such as those monitored by means of a switch to indicate when the extinguisher is removed from its bracket or cabinet, shall be manually inspected in accordance with 7.2.2.

Additional Proposed Changes

File Name	Description	Approved
NFPA_10_inspection_data_for_PI.zip		

Statement of Problem and Substantiation for Public Input

The healthcare industry is heavily regulated by the Center for Medicare & Medicaid Services (CMS). Hospitals must meet the CMS's Conditions of Participation in order to receive CMS reimbursement for their services which is a substantial part of their income. CMS k-tag K355 requires portable fire extinguishers to be inspected in accordance with NFPA 10. It is routine for hospitals to be required to produce documentation of monthly fire extinguisher inspections during licensure and accreditation surveys.

The American Society of Health Care Engineering gathered 2022 fire extinguisher inspection data from dozens of hospitals. The data submitted with the Public Input indicates that 291,476 monthly fire extinguisher inspection resulted in only 269 deficient conditions which is a 0.092% failure rate. Based on this data, it is appropriate to reduce the inspection frequency in buildings containing a hospital when only 1 in 1000 fire extinguishers inspections locate a failing condition.

One of the reasons for such a low failure rate is that hospitals are required to perform Environment of Care survey rounds which are likely to pick up if a fire extinguisher is missing from its normal location or has another obvious deficient condition. Furthermore, all new construction projects in health care occupancies are required to be provided with sprinkler protection which provides another additional layer of safety to the building occupants.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 168-NFPA 10-2023 [New Section after 7.2.4.2.3]	

Submitter Information Verification

Submitter Full Name: Lennon Peake
Organization: Koffel Associates, Inc.

Affiliation: American Society of Health Care Engineering
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 26 13:20:33 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Monthly inspections are based on the characteristics of an extinguisher and not on the occupancy. Regardless of the occupancy a fire extinguisher is located, a monthly inspection is required to ensure the extinguisher is operational for life safety. The monthly inspection aligns with the extinguisher manufacturer recommendations and with the product listing.

Public Input No. 53-NFPA 10-2022 [New Section after 7.2.1.1]

7.2.1.1.a. Intervals of portable fire extinguishers

Interval of all type portable fire extinguishers should not exceed one month as per 7.2.2. Inspection Procedures

Statement of Problem and Substantiation for Public Input

It is immediately clear that all hand-held fire extinguishers must be checked once a month

Submitter Information Verification

Submitter Full Name: Kamil Lagiewka
Organization: Seawareness
Affiliation: Seawareness
Street Address:
City:
State:
Zip:
Submittal Date: Thu Oct 06 06:50:13 EDT 2022
Committee: PFE-AAA

Committee Statement

Resolution: This requirement is already provided in 7.2.1.2.

Public Input No. 50-NFPA 10-2022 [Section No. 7.2.1.2 [Excluding any Sub-Sections]]

Fire extinguishers and Class D extinguishing agents shall be inspected either manually or by means of an electronic monitoring device/system ~~at intervals not exceeding 31 days~~ monthly with a minimum of 3 weeks and a maximum of 5 weeks between inspections .

Statement of Problem and Substantiation for Public Input

This change allows inspections for fire extinguishers to meet the once per calendar month inspection while allowing for variations in inspectors' schedules. These allowances do not impact the intent of having a functional fire extinguisher available for use in case of fire. These allowances are already used in NFPA 101 (2020 Edition) for emergency lighting.

Submitter Information Verification

Submitter Full Name: Katherine Moore
Organization: Savannah River Nuclear Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 02 13:55:19 EDT 2022
Committee: PFE-AAA

Committee Statement

Resolution: The reference in the substantiation to NFPA 101 is for emergency lighting which does not relate to the scope of NFPA 10. Adopting a minimum of 3 weeks would conflict with 7.2.1.3.

Public Input No. 111-NFPA 10-2023 [New Section after 7.2.1.2.1]

7.2.2 Performance-Based Option

7.2.2.1 As an alternative means of compliance with 7.2.1, subject to the AHJ, fire extinguishers shall be permitted to be inspected under a written performance-based program.

7.2.2.2 Goals established under a performance-based program shall provide assurance that the fire extinguisher is maintained in proper condition.

7.2.2.3 Technical justification for inspection intervals shall be documented in writing.

7.2.2.4 The performance-based option shall include historical data acceptable to the AHJ.

Additional Proposed Changes

File Name	Description	Approved
10_PC4.pdf	10_PC4	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as “Reject but Hold” in Public Comment No. 4 of the (A2021) Second Draft Report for NFPA 10 and per the Regs. at 4.4.8.3.1.

This Public Comment is related to Committee Input 50 to allow a performance-based option for inspection of fire extinguishers.

This new section provides a basis for implementing and monitoring a performance-based program provided that approval is obtained by the authority having jurisdiction. The concept of a performance based inspection program is to establish the requirements and frequencies at which inspection must be performed to demonstrate an acceptable level of operational reliability. The goal is to balance the inspection frequency with proven reliability of the extinguisher. The goal of a performance-based inspection program is also to adjust inspection frequencies commensurate with historical documented equipment reliability. Frequencies of inspection under a performance-based program may be extended or reduced from the prescriptive inspection requirements when continued inspection and testing has been documented indicating a higher or lower degree of reliability as compared to the authority having jurisdiction’s expectations of performance.

As an example, fire extinguisher inspection could increase from monthly to weekly when the failure rate exceeds the authority having jurisdiction’s expectations or the inspection frequency could decrease from monthly to quarterly when the failure trends indicate an increase in reliability. A fundamental requirement of this performance-based program would be the continual monitoring of fire extinguisher failure rates and determining if they exceed the maximum allowable failure rates as agreed upon with the authority having jurisdiction. The process used to complete this review would be documented and be repeatable.

Submitter Information Verification

Submitter Full Name: TC ON PFE-AAA
Organization: NFPA TC ON Portable Fire Extinguishers
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 22 13:43:43 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-22-NFPA 10-2023

Statement: This revision provides a basis for implementing and monitoring a performance-based program, provided that approval is obtained by the authority having jurisdiction on a per site basis. The concept of a performance-based inspection program is to establish the requirements and frequencies at which inspection must be performed to demonstrate an acceptable level of operational reliability. The goal is to balance the inspection frequency with proven reliability of the extinguisher. The goal of a performance-based inspection program is also to adjust inspection frequencies commensurate with historical documented equipment reliability. Frequencies of inspection under a performance-based program can be extended or reduced from the prescriptive inspection requirements when continued inspection has been documented indicating a higher or lower degree of reliability as compared to the authority having jurisdiction's expectations of performance.

Public Comment No. 4-NFPA 10-2020 [New Section after 7.2.1.2.1]

7.2.2 Performance-Based Option

7.2.2.1 As an alternative means of compliance with 7.2.1, subject to the AHJ, fire extinguishers shall be permitted to be inspected under a written performance-based program.

7.2.2.2 Goals established under a performance-based program shall provide assurance that the fire extinguisher is maintained in proper condition.

7.2.2.3 Technical justification for inspection intervals shall be documented in writing.

7.2.2.4 The performance-based option shall include historical data acceptable to the AHJ.

Statement of Problem and Substantiation for Public Comment

This Public Comment is related to Committee Input 50 to allow a performance-based option for inspection of fire extinguishers.
This new section provides a basis for implementing and monitoring a performance-based program provided that approval is obtained by the authority having jurisdiction. The concept of a performance-based inspection program is to establish the requirements and frequencies at which inspection must be performed to demonstrate an acceptable level of operational reliability. The goal is to balance the inspection frequency with proven reliability of the extinguisher. The goal of a performance-based inspection program is also to adjust inspection frequencies commensurate with historical documented equipment reliability. Frequencies of inspection under a performance-based program may be extended or reduced from the prescriptive inspection requirements when continued inspection and testing has been documented indicating a higher or lower degree of reliability as compared to the authority having jurisdiction's expectations of performance.

As an example, fire extinguisher inspection could increase from monthly to weekly when the failure rate exceeds the authority having jurisdiction's expectations or the inspection frequency could decrease from monthly to quarterly when the failure trends indicate an increase in reliability.

A fundamental requirement of this performance-based program would be the continual monitoring of fire extinguisher failure rates and determining if they exceed the maximum allowable failure rates as agreed upon with the authority having jurisdiction. The process used to complete this review would be documented and be repeatable.

Related Item

• CI 50

Submitter Information Verification

Submitter Full Name: Lennon Peake
Organization: Koffel Associates, Inc.
Affiliation: American Society of Healthcare Engineering
Street Address:
City:
State:
Zip:
Submittal Date: Tue Feb 18 10:37:05 EST 2020

Committee: PFE-AAA

Committee Statement

Committee Action: Rejected but held

Resolution: The public comment constitutes new material because CI-50 did not include draft performance-based code language. The language as submitted allows a performance-based program but provides no enforceable criteria for such a program (as does performance-based design requirements in other codes and standards).

Public Input No. 43-NFPA 10-2022 [Section No. 7.2.2 [Excluding any Sub-Sections]]

Periodic inspection ~~or electronic monitoring~~ of fire extinguishers shall include a check of at least the following items:

(1) Location in designated place
(2) Visibility of the extinguisher or means of indicating the extinguisher location
(3) Access to the extinguisher
(4) Pressure gauge reading or indicator in the operable range or position
(5) Fullness determined by weighing or hefting
(6) Condition of tires, wheels, carriage, hose, and nozzle for wheeled extinguishers
(7) Indicator for nonrechargeable extinguishers using push-to-test pressure indicators
(8) Extinguisher fits securely in bracket or on hanger
(9) Extinguisher bracket or hanger is securely mounted to supporting surface or object
(10) Extinguisher cabinet, if present, is in good condition and operating order
(11) Locked extinguisher cabinets are equipped with correct break-front tool or device
(12) Fire rated cabinets, if also present, are intact and maintaining assembly integrity
(13) Extinguisher bag or soft cover, if present, is in good condition to protect extinguisher
(14) Supplemental signage such as wall pendants and co-located extinguisher placards remains valid and legible

Statement of Problem and Substantiation for Public Input

These additional requirements for the periodic inspection of fire extinguishers capture the ongoing presence or condition of extinguisher trim which was required by Chapter 6. At present, there are no requirements for extinguisher trim equipment which were mandated as part of the initial extinguisher installation to ever again be checked or maintained. That's simply a hole which needs to be plugged with requirements to inspect and address extinguisher installation issues which NFPA 10 regulated. The inspection process needs to look beyond the physical red can hanging on the wall to capture to other elements listed.
The 'electronic monitoring, wording was removed since the elements in items 8-14 are not able to be electronically monitored at the present time. While the subject of electronic monitoring remains actively under discussion by NFPA 10 these additional inspection items are not meant to impair the implementation of electronic monitoring technology but nonetheless this PI fills an important gap in Chapter 7 to support what was required in Chapter 6. If 7.2.2 is not the correct placement for these items then feel free to move them elsewhere in Chapter 7 and specify a frequency for inspection or verification.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 18:45:13 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: The proposed language is overly prescriptive and creates a barrier to the introduction of new technology into NFPA 10. There is no added benefit to the additional items proposed in the inspection list and is beyond the intent of this section to perform a quick check, giving some assurance that the extinguisher is in operational condition. The additional listed items are functions performed during the annual maintenance, performed by trained personnel, and not during the monthly inspection cycle.

Public Input No. 52-NFPA 10-2022 [Section No. 7.2.2 [Excluding any Sub-Sections]]

Periodic inspection or electronic monitoring of fire extinguishers shall include a check of at least the following items:

- ~~Location in designated place~~
- ~~Visibility of the extinguisher or means of indicating the extinguisher location~~
- ~~Access to the extinguisher~~
- ~~Pressure gauge reading or indicator in the operable range or position~~
- ~~Fullness determined by weighing or hefting~~
- ~~Condition of tires, wheels, carriage, hose, and nozzle for wheeled extinguishers~~
- ~~Indicator for nonrechargeable extinguishers using push-to-test pressure indicators~~

Powder cartridge types,

1 Control of the overall condition.

- Make sure it is accessible, reported, preferably visible from a distance and be installed on a fixed support.

- Check the presence and the good condition of the plastic seal and locking device. - Clean the entire extinguisher.

- Check the apparent condition of the fire extinguisher (absence of corrosion, accidental deformation, check the base).

2 Control of the mark of conformity's.

- Check the presence and the good state of the verification label that it contains the months, years and nature

of the interview, as well as the ID of the person who intervened during the last visit.

- Check the presence of the marks of conformity of the appliance

- Check the readability of the operating instructions marked on the device.

3 Check the pressure inside.

- Make sure there is no pressure in the extinguisher by activating the nozzle

Note: where the unit is under pressure, it is necessary to depressurize the tank by turning with the

headcap down and by operating the nozzle.

4. Turning extinguisher upside down,

- Return the extinguisher

- Loosen the powder by shaking the device strongly upwards

Water and foam extinguishers,

Same as above only item 1 to 3 required,

Co2 extinguishers,

Same as above only item 1 to 2 required,.
3 Check the test date written on the extinguisher.

Test of CO2 cylinder must be carried out no more than 10 years after the last test or according

the regulations “in force”.

- Check that the markings are on the cylinder shoulder. If you can’t read the individual number and

the year of manufactured: Remove from service any extinguishers with markings outside this zone.

Statement of Problem and Substantiation for Public Input

There is a gap what exactly should be checked during monthly inspection of portable fire extinguisher.
My proposed is divided for eacht type of extinguishers and cover all checks.
This suggestion is more clear and will be increase safety.

Submitter Information Verification

Submitter Full Name: Kamil Lagiewka
Organization: SEAWARENESS
Affiliation: SEAWARENESS
Street Address:
City:
State:
Zip:
Submittal Date: Thu Oct 06 06:37:35 EDT 2022
Committee: PFE-AAA

Committee Statement

Resolution: Section 7.2.2 is intended to be a general list of items that can be checked monthly on any type of extinguisher by facility personnel or members of the general public. The proposed language rewrites all of 7.2.2 in a way that does not align with NFPA 10 monthly inspection requirements and also is not compliant with existing manufacturer service manuals.

Public Input No. 77-NFPA 10-2023 [Section No. 7.2.2 [Excluding any Sub-Sections]]

Periodic inspection or electronic monitoring of fire extinguishers shall include a check of at least the following items:

(1) Location in designated place

(2) Visibility of the extinguisher or means of indicating the extinguisher location

(3) Access to the extinguisher

(4) Pressure gauge reading or indicator in the operable range or position

(5) Fullness determined by weighing or hefting

(6) Condition of tires, wheels, carriage, hose, and nozzle for wheeled extinguishers

(7) Indicator for nonrechargeable extinguishers using push-to-test pressure indicator

(8) Broken or missing safety seals and tamper indicators

(9) Physical damage and corrosion

(10) Missing Parts

Statement of Problem and Substantiation for Public Input:

The current list of inspection procedures (1-7) required to be checked does not include broken or missing safety seals/ tamper indicators and more problematic issues like physical damage, corrosion, or missing parts.

Statement of Problem and Substantiation for Public Input

The current list of inspection procedures (1-7) required to be checked does not include broken or missing safety seals/tamper indicators and more problematic issues like physical damage, corrosion, or missing parts.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 14:29:03 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Section 7.2.2 is intended to be a monthly quick check performed by facility personnel. These proposed items are covered during annual maintenance, performed by trained personnel, and not during the monthly inspection cycle.

Public Input No. 110-NFPA 10-2023 [Section No. 7.2.4.1.1]

7.2.4.1.1

Where manual inspections are conducted, records for manual inspections shall be kept on a tag or label attached to the fire extinguisher, ~~on~~ as well as an inspection checklist maintained on file, or by an electronic method.

Additional Proposed Changes

File Name	Description	Approved
10_PC3.pdf	10_PC3	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as “Reject but Hold” in Public Comment No. 3 of the (A2021) Second Draft Report for NFPA 10 and per the Regs. at 4.4.8.3.1.

If the only record for inspection is a tag or a label attached to the fire extinguisher itself, there is a chance that that record could become lost or stolen. Having a checklist along with the tag or label will ensure that a record for inspection is maintained elsewhere. The electronic method would solve the issue, but not everyone uses that method.

Submitter Information Verification

Submitter Full Name: TC ON PFE-AAA
Organization: NFPA TC ON Portable Fire Extinguishers
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 22 13:37:48 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: It is the responsibility of the facility owner to maintain records of a manual inspection. The decision to maintain multiple forms of record is the responsibility of the owner. NFPA 10 only requires one form of record keeping.

Public Comment No. 3-NFPA 10-2020 [Section No. 7.2.4.1.1]

7.2.4.1.1

Where manual inspections are conducted, records for manual inspections shall be kept on a tag or label attached to the fire extinguisher, ~~on~~ as well as an inspection checklist maintained on file, or by an electronic method.

Statement of Problem and Substantiation for Public Comment

If the only record for inspection is a tag or a label attached to the fire extinguisher itself, there is a chance that that record could become lost or stolen. Having a checklist along with the tag or label will ensure that a record for inspection is maintained elsewhere. The electronic method would solve the issue, but not everyone uses that method.

Related Item

• FR-48

Submitter Information Verification

Submitter Full Name: Joseph Giroux
Organization: North MS Medical Center
Street Address:
City:
State:
Zip:
Submittal Date: Mon Feb 10 15:05:25 EST 2020
Committee: PFE-AAA

Committee Statement

Committee Action: Rejected but held

Resolution: The public comment constitutes new material since the proposed text is not germane to the action taken on FR-48. It is being held for the next revision cycle.

Public Input No. 37-NFPA 10-2022 [Section No. 7.2.4.2]

7.2.4.2 Electronic ~~Inspection~~ Monitoring Records.

7.2.4.2.1

Where electronically monitored systems are employed for inspections, records shall be kept for fire extinguishers found to require corrective action.

7.2.4.2.2

Records for electronic monitoring shall be kept to demonstrate that at least the last 12 monthly inspections have been performed.

7.2.4.2.3

For electronically monitored fire extinguishers, where the extinguisher causes a signal at a control unit when a deficiency in any of the conditions listed in 7.2.2 occurs, record keeping shall be provided in the form of an electronic event log at the control panel.

Statement of Problem and Substantiation for Public Input

This change makes it clear to all users that this section only applies to electronic monitoring systems and does not apply to fire extinguisher inspections that are performed manually but employ a computerized or 'electronic' method of keeping records. Common examples could be manual inspections with handheld devices which rely on user-input for inspection findings OR a manual inspection using pen & paper which are then scanned or digitized in a storage format such as PDF. This code clearly allows electronic recordkeeping (7.2.4.1.1) but this section (7.2.4.2) is limited only to true electronic fire extinguisher monitoring.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 17:48:56 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: Although both terms are correct, the preferred term is "inspection."

Public Input No. 168-NFPA 10-2023 [New Section after 7.2.4.2.3]

TITLE OF NEW CONTENT

7.2.5 Performance-Based Option.

7.2.5.1

As an alternate means of compliance with 7.2.1 , subject to the AHJ, fire extinguishers shall be permitted to be inspected under a written performance-based program.

7.2.5.2

Goals established under a performance-based program shall provide assurance that the fire extinguisher is maintained in proper condition.

7.2.5.3

Technical justification for inspection, testing, and maintenance intervals shall be documented in writing.

7.2.5.4

The performance-based option shall include historical data acceptable to the AHJ.

Additional Proposed Changes

File Name	Description	Approved
NFPA_10_inspection_data_for_PI.zip		

Statement of Problem and Substantiation for Public Input

This new section provides a basis for implementing and monitoring a performance-based program provided that approval is obtained by the authority having jurisdiction. The concept of a performance-based inspection program is to establish the requirements and frequencies at which inspection must be performed to demonstrate an acceptable level of operational reliability. The goal is to balance the inspection frequency with proven reliability of the extinguisher. The goal of a performance-based inspection program is also to adjust inspection frequencies commensurate with historical documented equipment reliability. Frequencies of inspection under a performance-based program may be extended or reduced from the prescriptive inspection requirements when continued inspection and testing has been documented indicating a higher or lower degree of reliability as compared to the authority having jurisdiction's expectations of performance.

As an example, fire extinguisher inspection could increase from monthly to weekly when the failure rate exceeds the authority having jurisdiction's expectations or the inspection frequency could decrease from monthly to quarterly when the failure trends indicate an increase in reliability.

A fundamental requirement of this performance-based program would be the continual monitoring of fire extinguisher failure rates and determining if they exceed the maximum allowable failure rates as agreed upon with the authority having jurisdiction. The process used to complete this review would be documented and be repeatable.

The American Society of Health Care Engineering gathered 2022 fire extinguisher inspection data from dozens of hospitals. The data submitted with the Public Input indicates that 291,476 monthly fire extinguisher inspection resulted in only 269 deficient conditions which is a 0.092% failure rate. It is appropriate to allow a performance based option due to the low failure rates.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 169-NFPA 10-2023 [Section No. 7.2.1]	

Submitter Information Verification

Submitter Full Name: Lennon Peake
Organization: Koffel Associates, Inc.
Affiliation: American Society of Health Care Engineering
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 26 13:14:12 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-22-NFPA 10-2023

Statement: This revision provides a basis for implementing and monitoring a performance-based program, provided that approval is obtained by the authority having jurisdiction on a per site basis. The concept of a performance-based inspection program is to establish the requirements and frequencies at which inspection must be performed to demonstrate an acceptable level of operational reliability. The goal is to balance the inspection frequency with proven reliability of the extinguisher. The goal of a performance-based inspection program is also to adjust inspection frequencies commensurate with historical documented equipment reliability. Frequencies of inspection under a performance-based program can be extended or reduced from the prescriptive inspection requirements when continued inspection has been documented indicating a higher or lower degree of reliability as compared to the authority having jurisdiction's expectations of performance.

Public Input No. 190-NFPA 10-2023 [Section No. 7.3.2.1]

7.3.2.1 Physical Condition.

An annual external visual examination of all fire extinguishers shall be made to detect obvious physical damage, corrosion, or nozzle blockage to verify that the operating instructions are present, legible, and facing forward, and that the HMIS information is present and legible, and to determine if a 6-year interval examination or hydrostatic test is due.

7.3.2.1.1

At the time of the annual external visual examination, a check of at least the inspection items of 7.2.2 and the external examination items of 7.3.2.1 shall be conducted.

N **7.3.2.1.2** Improperly labeled or marked fire extinguishers as referenced within sections 6.1.3.10 and 7.3.4 shall be replaced or removed from service until corrected.

Statement of Problem and Substantiation for Public Input

Improperly labeled and marked fire extinguishers continue to remain in service, because there currently is no requirement to correct or resolve such conditions. Improperly labeled extinguishers represent obvious communication and operational delay issues.

ANSI/UL fire extinguisher design requirements addressing labeling requirements specifically prohibit the placement of any advertising information on the front such as addresses or phone numbers which might distract essential operational information.

Supporting References:

NFPA-10 paragraph 6.1.3.10.2….. Hazardous Material Identification System (HMIS) labels, 6-year maintenance labels, hydrostatic test labels or other labels shall not be located or placed on the front of the extinguisher.

NFPA-10 paragraph 7.3.5 Corrective Action. When maintenance of any fire extinguisher reveals a deficiency, immediate corrective action shall be taken.

UL-299 fire extinguisher design and listing standard part 69.4 ……. When the manufacturer's name or trade name is placed below the use code symbols, it shall not contain any other information that distracts attention from the operating instructions, such as an address or telephone number.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 30 20:51:31 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-24-NFPA 10-2023
Statement: Improperly labeled and marked fire extinguishers continue to remain in service because there have been no requirements to correct or resolve such conditions. Improperly labeled extinguishers represent obvious communication, delay, or confusion for novice users.

Public Input No. 132-NFPA 10-2023 [Section No. 7.3.3.1]

7.3.3.1* Maintenance Intervals.

Fire extinguishers shall be internally examined at intervals not exceeding those specified in Table 7.3.3.1.

Table 7.3.3.1 Maintenance Involving Internal Examination

Extinguisher Type	Internal Examination Interval (years)
Stored-pressure loaded stream and antifreeze	1
Pump tank water and pump tank, calcium chloride based	1
Dry chemical, cartridge- and cylinder-operated, with mild steel shells	1*
Dry powder, cartridge- and cylinder-operated, with mild steel shells	1*
Wetting agent	1
Ecapsulator agent	5
Stored-pressure water	5
AFFF (aqueous film-forming foam)	3†
FFFP (film-forming fluoroprotein foam)	3†
Stored-pressure dry chemical, with stainless steel shells	5
Carbon dioxide	5
Wet chemical	5
Dry chemical stored-pressure, with mild steel shells, brazed brass shells, and aluminum shells	6
Halogenated agents	6
Dry powder, stored-pressure, with mild steel shells	6

*Dry chemical and dry powder in cartridge- or cylinder-operated extinguishers are examined annually.

†The extinguishing agent in liquid charge-type AFFF and FFFP extinguishers is replaced every 3 years, and an internal examination (teardown) is normally conducted at that time.

Statement of Problem and Substantiation for Public Input

Added language for Encapsulator Agenets (EA) maintenance schedule involving internal inspection.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 07:36:21 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-15-NFPA 10-2023
Statement: The term “foam” has been used to replace AFFF, FFFP and SFFF (which was proposed by public input) to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world. SFFF, while not currently used in

portable fire extinguishers, is also a synthetic foam.

Encapsulator agent has not been added to the table since there is insufficient information to support including encapsulator agent.

The footnote for dry chemical and dry chemical powder has been removed as it provides no additional value to the table.

The footnote extending the internal examination interval for foam extinguishing agents has not been adopted because no technical information has been provided to support a 5-year interval. There might be extinguishers in the market that are more prone to internal degradation than others. Including the exception to the 3 year interval would not be appropriate for foam extinguishers in the market that are more susceptible to degradation. Additionally, the current footnote has been removed because it led the user to believe that they are required to replace the agent every 3 years, which is in conflict with 7.8.2.3.1.

Public Input No. 191-NFPA 10-2023 [Section No. 7.3.3.1]

7.3.3.1* Maintenance Intervals.

Fire extinguishers shall be internally examined at intervals not exceeding those specified in Table 7.3.3.1.

Table 7.3.3.1 Maintenance Involving Internal Examination

Extinguisher Type	Internal Examination Interval (years)
Stored-pressure loaded stream and antifreeze	1
Pump tank water and pump tank, calcium chloride based	1
Dry chemical, cartridge- and cylinder-operated, with mild steel shells	1*
Dry powder, cartridge- and cylinder-operated, with mild steel shells	1*
Wetting agent	1
Stored-pressure water	5
AFFF (aqueous film-forming foam)	3†
FFFP (film-forming fluoroprotein foam)	3†
Stored-pressure dry chemical, with stainless steel shells	5
Carbon dioxide	5
Wet chemical and agent suspension	5
Dry chemical stored-pressure, with mild steel shells, brazed brass shells, and aluminum shells	6
Halogenated agents	6
Dry powder, stored-pressure, with mild steel shells	6

*Dry chemical and dry powder in cartridge- or cylinder-operated extinguishers are examined annually.

†The extinguishing agent in liquid charge-type AFFF and FFFP extinguishers is replaced every 3 years, and an internal examination (teardown) is normally conducted at that time.

Statement of Problem and Substantiation for Public Input

As referenced in Clause 1.2.2, “Nothing in this standard shall be construed as a restriction on new technologies or alternative arrangements, provided that the level of protection as herein described is not lowered and is acceptable to the authority having jurisdiction.” A new water-based extinguishing agent in the form of an agent suspension has been evaluated as a component intended for use in fire extinguishers listed and labeled to meet or exceed all requirements of UL 711, CAN/ULC-S508 and UL 8, CAN/ULC-S554.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 192-NFPA 10-2023 [New Section after 3.3.1]	
Public Input No. 192-NFPA 10-2023 [New Section after 3.3.1]	

Submitter Information Verification

Submitter Full Name: Blake Shugarman
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 31 11:19:37 EDT 2023

Committee: PFE-AAA

Committee Statement

Resolution: CI-14-NFPA 10-2023

Statement: Additional information needs to be provided (e.g., SDS, service history, previous testing, service manual, stability with vibrations, aging, temperature cycling, stability over time) to fully consider the inclusion of agent suspensions within NFPA 10.

Public Input No. 91-NFPA 10-2023 [Section No. 7.3.3.1]

7.3.3.1* Maintenance Intervals.

Fire extinguishers shall be internally examined at intervals not exceeding those specified in Table 7.3.3.1.

Table 7.3.3.1 Maintenance Involving Internal Examination

Extinguisher Type	Internal Examination Interval (years)
Stored-pressure loaded stream and antifreeze	1
Pump tank water and pump tank, calcium chloride based	1
Dry chemical, cartridge- and cylinder-operated, with mild steel shells	1*
Dry powder, cartridge- and cylinder-operated, with mild steel shells	1*
Wetting agent	1
Stored-pressure water	5
AFFF (aqueous film-forming foam)	3†
FFFP (film-forming fluoroprotein foam)	3†
SFFF (synthetic fluorine-free foam)	3†
Stored-pressure dry chemical, with stainless steel shells	5
Carbon dioxide	5
Wet chemical	5
Dry chemical stored-pressure, with mild steel shells, brazed brass shells, and aluminum shells	6
Halogenated agents	6
Dry powder, stored-pressure, with mild steel shells	6

*Dry chemical and dry powder in cartridge- or cylinder-operated extinguishers are examined annually.~~†The extinguishing agent in liquid charge-type AFFF and FFFP extinguishers is replaced every 3 years, and an internal examination (teardown) is normally conducted at that time~~

†Foam extinguishing agents having 5-year replacement interivals are exempt from this reuqirement .

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:52:15 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-15-NFPA 10-2023

Statement: The term “foam” has been used to replace AFFF, FFFP and SFFF (which was proposed by public input) to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world. SFFF, while not currently used in portable fire extinguishers, is also a synthetic foam.

Encapsulator agent has not been added to the table since there is insufficient information to support including encapsulator agent.

The footnote for dry chemical and dry chemical powder has been removed as it provides no additional value to the table.

The footnote extending the internal examination interval for foam extinguishing agents has not been adopted because no technical information has been provided to support a 5-year interval. There might be extinguishers in the market that are more prone to internal degradation than others. Including the exception to the 3 year interval would not be appropriate for foam extinguishers in the market that are more susceptible to degradation. Additionally, the current footnote has been removed because it led the user to believe that they are required to replace the agent every 3 years, which is in conflict with 7.8.2.3.1.

Public Input No. 78-NFPA 10-2023 [Section No. 7.3.4.1.1]

7.3.4.1.1

The tag or label, as a minimum, shall identify the following:

(1) Month and year maintenance was performed

(2) Person performing the work

(3) Name of the agency performing the work

Edit line to read as revised

(3) Name /address of the agency performing the work

Statement of Problem and Substantiation for Public Input:

Without an address and contact details enforcement and follow-up is difficult especially in locations that do not possess licensing requirements.

Statement of Problem and Substantiation for Public Input

Without an address and contact details enforcement and follow-up is difficult especially in locations that do not possess licensing requirements.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 14:34:11 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-25-NFPA 10-2023
Statement: An address has been included to 7.3.4.1.1(3) since without an address and contact details enforcement and follow-up is difficult especially in locations that do not possess licensing requirements.

Public Input No. 114-NFPA 10-2023 [Section No. 7.6]

7.6 Electronic Monitoring System Maintenance.

7.6.1 Electronic Monitoring.

The components of the monitoring device/system shall be tested and maintained annually in accordance with the manufacturer's maintenance manual, with the following items included as a minimum:

(1) Power supply inspection/battery change

(2) Obstruction sensor inspection

(3) Location sensor inspection

(4) Pressure indication inspection

(5) Connection continuity inspection *(see 7.6.1.1 and 7.6.1.2)*

7.6.1.1

One hundred percent of all units shall be tested upon initial installation or reacceptance with verification of communication between the device connecting the fire extinguisher electronic monitoring device/system and the fire alarm control or other control unit to ensure proper signals are received at the control unit and remote annunciator(s), if applicable.

7.6.1.2

One hundred percent of all units shall be tested annually with verification of communication between the device connecting the fire extinguisher electronic monitoring device/system and the fire alarm control unit or other control unit to ensure proper signals are received at the control unit and remote annunciator(s), if applicable.

7.6.2 Fire Alarm System.

Where used in conjunction with fire alarm systems, fire extinguisher electronic monitoring devices shall be inspected and maintained in accordance with *NFPA 72*.

7.6.2.1

Where used in conjunction with non-fire alarm systems, fire extinguisher electronic monitoring devices shall be inspected and maintained as required in 7.6.1 through 7.6.1.2 and the manufacturer's installation and maintenance manual(s).

7.6.3 Corrective Action.

Where maintenance of any monitoring system reveals a deficiency, immediate corrective action shall be taken.

Additional Proposed Changes

File Name	Description	Approved
10_PC35.pdf	10_PC35	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Reject but Hold" in Public Comment No. 35 of the (A2021) Second Draft Report for NFPA 10 and per the Regs. at 4.4.8.3.1.

The requirements for the inspection, testing, and maintenance of fire alarm system connected extinguisher monitoring devices is already established in NFPA 72(2019) and it requires the following: Table 14.3.1 #19-1 visual inspection of FE monitoring devices on a semi-annual basis. Table 14.4.3.2 #19-1 testing at acceptance and annually thereafter.

The changes here apply to non-fire alarm system electronic fire extinguisher monitoring and the modifications bring the inspection and testing requirements into sync with those for NFPA 72 connected systems. There is no reason or justification to apply a less restrictive inspection routine to non-fire alarm connected systems than that which is required by NFPA 72 for fire alarm connected extinguisher monitoring. The goal is the same and the backbone control system is irrelevant to the end result.

The terminology was also modified to make it clear that the NFPA 72 requirements or this section's requirements apply to the inspection, testing, and maintenance of the equipment. Each term is specifically defined and triggers a different activity. Without all three together something is being left out in the overall process. Inspection is a visual activity, testing is a physical demonstration of function, and maintenance is what is done to keep it working over the course of time and exposure.

Submitter Information Verification

Submitter Full Name: TC ON PFE-AAA
Organization: NFPA TC ON Portable Fire Extinguishers
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 22 14:39:40 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: This section is on maintenance and testing which is an annual requirement and aligns with NFPA 72. This section is not intended to address inspections.

Public Comment No. 35-NFPA 10-2020 [Section No. 7.6]

7.6 Electronic Monitoring System Maintenance.

7.6.1 Electronic Monitoring ~~.~~

~~The components of the monitoring device/~~

System Inspection

T he fire extinguisher electronic monitoring system shall be

~~tested and maintained annually in accordance with the manufacturer's maintenance manual, with the following items included as a minimum~~

inspected semi-annually and at a minimum include the following :

(1) Power supply inspection/battery change

(2) Obstruction sensor inspection

(3) Location sensor inspection

(4) Pressure indication inspection

(5) Connection continuity inspection *(see 7.6.1.1 and 7.6.1.2)*

7.6.1.1

One hundred percent of all units shall be tested upon initial installation or reacceptance ~~with verification of~~ to verify communication between the device connecting the fire extinguisher electronic monitoring device/system and the fire alarm control or other control unit to ensure proper signals are received at the control unit and remote annunciator(s), if applicable.

7.6.1.2

One hundred percent of all units shall be tested annually ~~with verification of~~ to verify communication between the device connecting the fire extinguisher electronic monitoring device/system and the fire alarm control unit or other control unit to ensure proper signals are received at the control unit and remote annunciator(s), if applicable.

7.6.2 Fire Alarm System.

Where ~~used in conjunction with fire~~ connected to a fire alarm systems, the fire extinguisher electronic monitoring devices shall be inspected, tested, and maintained in accordance with *NFPA 72*.

7.6.2.1

Where used in conjunction with non-fire alarm systems, fire extinguisher electronic monitoring devices shall be inspected, tested, and maintained as required in 7.6.1 through 7.6.1.2 and the manufacturer's installation and maintenance manual(s).

7.6.3 Corrective Action.

Where the inspection, testing, or maintenance of any monitoring system reveals a deficiency, immediate corrective action shall be taken.

Statement of Problem and Substantiation for Public Comment

The requirements for the inspection, testing, and maintenance of fire alarm system connected extinguisher monitoring devices is already established in NFPA 72(2019) and it requires the following:
Table 14.3.1 #19-1 visual inspection of FE monitoring devices on a semi-annual basis.
Table 14.4.3.2 #19-1 testing at acceptance and annually thereafter.

The changes here apply to non-fire alarm system electronic fire extinguisher monitoring and the modifications bring the inspection and testing requirements into sync with those for NFPA 72 connected systems. There is no reason or justification to apply a less restrictive inspection routine to non-fire alarm connected systems than that which is required by NFPA 72 for fire alarm connected extinguisher monitoring. The goal is the same and the backbone control system is irrelevant to the end result.
The terminology was also modified to make it clear that the NFPA 72 requirements or this section's requirements apply to the inspection, testing, and maintenance of the equipment. Each term is specifically defined and triggers a different activity. Without all three together something is being left out in the overall process. Inspection is a visual activity, testing is a physical demonstration of function, and maintenance is what is done to keep it working over the course of time and exposure.

Related Item

• FR # 24 • FR # 23

Submitter Information Verification

Submitter Full Name: David Phelan
Organization: NFPA 10 Committee Member
Affiliation: Not Representing any Entity or Client
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 07 12:14:14 EDT 2020
Committee: PFE-AAA

Committee Statement

Committee Action: Rejected but held
Resolution: The proposed language requires additional research and correlation with NFPA 72. It is being held for the next revision cycle.

Public Input No. 44-NFPA 10-2022 [Section No. 7.6]

7.6 Electronic Monitoring System Inspection, Testing, and Maintenance~~.~~

7.6.1 Electronic Monitoring System Inspection .

The components of ~~the monitoring device/system shall be tested and maintained annually in accordance with the manufacturer's maintenance manual, with the following items included as a minimum~~ all electronic monitoring devices or systems shall be inspected semi-annually and at a minimum include the following :

(1) Power supply inspection/battery change

(2) Obstruction sensor inspection

(3) Location sensor inspection

(4) Pressure indication inspection

(5) Connection continuity inspection *(see 7.6.1.1 and 7.6.1.2)*

7.6.1.1

One hundred percent of all units shall be tested upon initial installation or reacceptance ~~with verification of~~ to verify communication between the device connecting the fire extinguisher electronic monitoring device/ system and the fire alarm control or other control unit to ensure proper signals are received at the control unit and remote annunciator(s), if applicable.

7.6.1.2

One hundred percent of all units shall be tested annually ~~with verification of communication~~ to verify communication between the device connecting the fire extinguisher electronic monitoring device/ system and the fire alarm control unit or other control unit to ensure proper signals are received at the control unit and remote annunciator(s), if applicable.

7.6.2 Fire Alarm System.

Where ~~used in conjunction with fire alarm systems,~~ connected to a fire alarm system, the fire extinguisher electronic monitoring devices shall be inspected, tested, and maintained in accordance with *NFPA 72*.

7.6.2.1– Non-Fire Alarm Connected System.

Where used in conjunction with non-fire alarm systems, fire extinguisher electronic monitoring devices shall ~~be inspected and maintained as required in 7.6.1 through 7.6.1.2 and the manufacturer's installation and maintenance manual(s)~~ be tested annually in accordance with the manufacturer's instructions .

7.6.3 Corrective Action.

Where the inspection, testing, or maintenance of any fire extinguisher monitoring device or system reveals a deficiency or impairment , immediate corrective action shall be taken or manual periodic inspections shall be instituted until corrective action is completed .

7.6.4 Discontinuation of Electronic Monitoring

7.6.4.1 Where electronic monitoring is discontinued manual periodic inspections in accordance with this chapter shall immediately resume and the Authority Having Jurisidiction shall be notified.

Statement of Problem and Substantiation for Public Input

This PI was placed on Reject But Hold status from the prior cycle and is presented again for consideration. This language seeks to hold both fire alarm connected and non-fire alarm connected electronic monitoring systems to the same standard for inspection, testing, and maintenance as currently found in NFPA 72, which includes a semi-annual visual inspection of connected devices. There is no justification to create two different standards of inspection, testing, and maintenance just because the electronic monitoring may be via a stand alone control unit versus the building fire alarm control unit. The terminology of inspection, testing, and maintenance was deliberately used to follow NFPA 72 and presented in an easy to follow form.
A new edit was added to address the actions needed if an electronic monitoring device or system is impaired or deficient as well as the actions required should electronic monitoring be discontinued at a site.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 19:00:46 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: This section is on maintenance and testing which is an annual requirement and aligns with NFPA 72. This section is not intended to address inspections.

Public Input No. 9-NFPA 10-2021 [Section No. 7.6]

7.6 Electronic Monitoring System Maintenance.

7.6.1 Electronic Monitoring.

The components of the monitoring device/system shall be tested and maintained annually in accordance with the manufacturer's maintenance manual, with the following items included as a minimum:

(1) Power supply inspection/battery change

(2) Obstruction sensor inspection

(3) Location sensor inspection

(4) Pressure indication inspection

(5) Connection continuity inspection *(see 7.6.1.1 and 7.6.1.2)*

7.6.1.1

One hundred percent of all units shall be tested upon initial installation or reacceptance with verification of communication between the device connecting the fire extinguisher electronic monitoring device/system and the fire alarm control or other control unit to ensure proper signals are received at the control unit and remote annunciator(s), if applicable.

7.6.1.2

One hundred percent of all units shall be tested annually with verification of communication between the device connecting the fire extinguisher electronic monitoring device/system and the fire alarm control unit or other control unit to ensure proper signals are received at the control unit and remote annunciator(s), if applicable.

7.6.2 Fire Alarm System.

Where used in conjunction with fire alarm systems, fire extinguisher electronic monitoring devices shall be inspected and maintained in accordance with *NFPA 72*.

7.6.2.1

Where used in conjunction with non-fire alarm systems, fire extinguisher electronic monitoring devices shall be inspected and maintained as required in 7.6.1 through 7.6.1.2 and the manufacturer's installation and maintenance manual(s).

7.6.3 Corrective Action.

Where maintenance of any monitoring system reveals a deficiency, immediate corrective action shall be taken.

Additional Proposed Changes

File Name	Description	Approved
LLT.1639510938943.docx		

Statement of Problem and Substantiation for Public Input

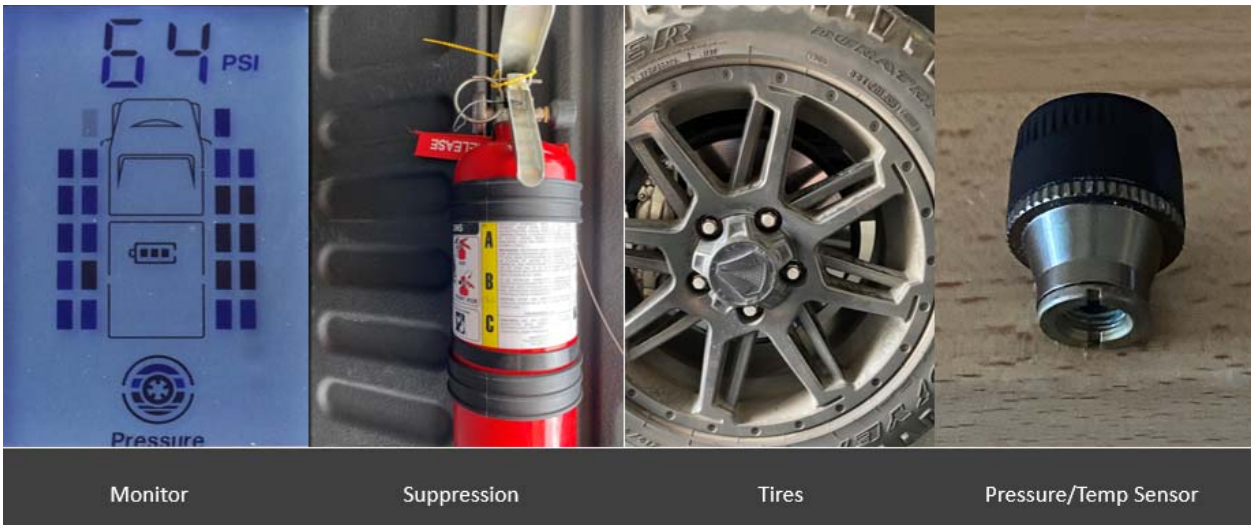
I would proposed that section 7.6.1 point 2 text to include 2. obstruction sensor inspection (if applicable) & 7.6.1 point 3 text to include 3. local sensor inspection (if applicable). section 7.6.1 point 5 text to include 5. Connection continuity inspection (if applicable - 7.6.1.1 * 7.6.1.2) It is well know that many fire extinguishers exist in homes and RV's, these systems are not governed by the same rules as business/workplaces such as monthly inspections. in many cases fire extinguishers are placed in cabinets, cupboards and garages without being looked at until too late. The proposed systems are simple use and require minimal to no maintenance unless batteries require replacing, or the extinguisher has been used. The systems are pre-set for High/Low Temperature and High/Low pressure, when either fall out of parameter a signal is sent to the main monitor triggering an Alarm. It is also setup to alarm if the extinguisher is removed from location, used or tampered with. Saving life, saving property is the goal of these systems and allowing such monitoring to be used in homes and vehicles could save many lives and protect fire fighters from dangers and could be avoided. Our systems utilize standard USB C charging for 247 monitors (with battery backup) and either sealed or user replaceable CR batteries installed within the sensor.

Submitter Information Verification

Submitter Full Name: Martin Bruce
Organization: EGB Global
Street Address:
City:
State:
Zip:
Submittal Date: Tue Dec 14 14:37:18 EST 2021
Committee: PFE-AAA

Committee Statement

Resolution: There are various types of electronic monitoring in the industry. This is a minimum list that would apply to systems with all of these components. Where a particular electronic monitoring doesn't have one of these items, then the testing and maintenance would not apply as the system does not have the identified component.



LLT-1 is a pressure and temperature monitoring system for static or dynamic equipment for fire extinguisher system on the market. This technology provides additional safety and assurance to vehicles and buildings.

It is designed to continuously monitor pressure and temperature of fire extinguisher equipment and offers both visual and audible warnings when pre-programed settings fall out of range.

- TPMS – total pressure monitoring system – anything pressure & temperature sensitive
- For cars, tow vehicles, motor homes, buses, 5th wheels, travel trailers, 4x4s & trucks, homes and buildings
- For fire extinguishers
- 24/7 fire extinguisher monitoring
- Visual & audible pressure loss warnings
- High accuracy
- Low and high-pressure/temperature alarms
- Pressure reading range 0-252 psi (pre-settable windows)
- Temperature rating -40 + 125C (pre-settable windows)
- Sensors can be mounted internally or externally depending on application and range.
- Sensor locking system.
- Sensor power source - CR1632 batteries, replaceable or single use
- Low Battery warning
- Singla warning

Public Input No. 150-NFPA 10-2023 [New Section after 7.8.2.2.2]

7.8.2.3 Encapsulator Agent (EA)

The premixed agent in liquid-charge-type EA fire extinguishers shall be replaced following the fire extinguisher manufacturer's instructions, not to exceed the 5-year hydrostatic test interval.

Statement of Problem and Substantiation for Public Input

Added language for Encapsulator Agent (EA) replacement consistent with other agents in the Standard.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 11:40:43 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: This has not been adopted because portable fire extinguishers with encapsulator agents are not listed and labeled, which does not comply with NFPA 10. NFPA 10 requires extinguishers to be listed and labeled and meet or exceed all the requirements of ANSI/UL 711, CAN/ULC-S508, Standard for the Rating and Fire Testing of Fire Extinguishers, and one of the performance standards, such as, ANSI/UL 8, CAN/ULC -S554, Water Based Agent Fire Extinguishers (reference NFPA 10, Section 4.1.1).

Public Input No. 151-NFPA 10-2023 [New Section after 7.8.2.2.2]

7.8.3.2.1

Only the Encapsulator Agent (EA) specified on the extinguisher nameplate shall be used for recharge.

Statement of Problem and Substantiation for Public Input

Added language for Encapsulator Agent (EA) replacement consistent with other agents in the Standard.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 11:43:44 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: This has not been adopted because portable fire extinguishers with encapsulator agents are not listed and labeled, which does not comply with NFPA 10. NFPA 10 requires extinguishers to be listed and labeled and meet or exceed all the requirements of ANSI/UL 711, CAN/ULC-S508, Standard for the Rating and Fire Testing of Fire Extinguishers, and one of the performance standards, such as, ANSI/UL 8, CAN/ULC -S554, Water Based Agent Fire Extinguishers (reference NFPA 10, Section 4.1.1).

Public Input No. 92-NFPA 10-2023 [Section No. 7.8.2.3]

7.8.2.3 AFFF, FFFP and ~~FFFP~~ SFFF .

7.8.2.3.1

The premixed agent in ~~liquid-charge-type AFFF and FFFP fire~~ foam fire extinguishers shall be replaced following the fire extinguisher manufacturer's instructions, not to exceed the 5-year hydrostatic test interval.

7.8.2.3.2

Only the foam agent specified on the extinguisher nameplate shall be used for recharge.

7.8.2.3.3

The agent in nonpressurized ~~AFFF and FFFP fire~~ foam fire extinguishers that is subjected to agent analysis in accordance with manufacturer's instructions shall not be required to comply with 7.8.2.3.1.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 15:58:22 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-18-NFPA 10-2023
Statement: The term "foam" has been used to replace AFFF, FFFP and SFFF (which was proposed by public input) to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world. SFFF, while not currently used in portable fire extinguishers, is also a chemical foam.

Public Input No. 196-NFPA 10-2023 [Section No. 7.8.3.3.1]

7.8.3.3.1

The remaining dry chemical in a discharged fire extinguisher shall be permitted to be re-used, provided that ~~it is thoroughly checked for the proper type, contamination, and condition~~ its chemical composition continues to match the agent listed on the nameplate and it remains free of significant moisture .

Statement of Problem and Substantiation for Public Input

Removed text is ambiguous/vague.

The current wording is like going to a mechanic and telling him to check the condition of your vehicle. What does the mechanic actually check? Lots of different things (filters, tires, brakes, fluids, etc.) and it may vary from mechanic to mechanic.

What exactly should the contractor be checking to determine a dry chemical agent's condition? Chemical composition, moisture content, moisture repellency, particle size distribution, bulk density, etc.? Is it totally up to the contractor or does this standard need to specify what exactly, at minimum, should be checked?

In my opinion, verifying the chemical composition and moisture content is the bare minimum.

The chemical composition, not just the type (agents of the same type can have different chemical compositions), needs to be verified to ensure the agent matches what is listed on the nameplate as required by the standard. To my understanding, the equipment has only ever been evaluated (i.e. listed) with the agent(s) listed on the nameplate. i.e. we have no idea if/how the extinguisher will work with any other agent. Using any other agent (or a mixture of agents, anything unlike the listed agent's chemical composition) voids the listing and no longer meets this standard.

Moisture content, one of the most common forms of contamination, is a benchmark used in most, if not all, standards concerned with the dry chemical inspection, testing, and maintenance. Moisture can lead to caking of the agent (which can lead to poor flow) and/or corrosion (and thus weakening) of the vessel.

When specifying what exactly needs to be checked, please consider how a contractor will do this. Most attributes can't be verified visually. What's more, not all product data sheets specify requirements for these attributes. Can we trust maintenance records? (i.e. last time the records state the extinguisher was filled with Manufacturer X's ABC agent, that must be what is in there/its chemical composition must be that of Manufacture X's ABC agent)

Submitter Information Verification

Submitter Full Name: Grant Lobdell
Organization: Dyne Technologies LLC
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 01 00:00:00 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: It is not practical during recharge to ensure that the chemical composition of the agent on the nameplate or agent identified in 7.8.3.1 is the same chemical composition of the agent inside the extinguisher. The dry chemical composition of the agent is proprietary. Additionally, the submitter has not provided a technical substantiation to show that the current process is inadequate and that chemical composition testing would result in substantial reduction of risk.

Public Input No. 197-NFPA 10-2023 [Section No. 7.8.3.4.2]

7.8.7.8. 3.4.2 –

~~Prior to re-use, the dry chemical shall be thoroughly checked for the proper type, contamination, and condition~~

Any dry chemical being reused shall have a chemical composition that matches the agent listed on the nameplate and shall be free of significant moisture .

Statement of Problem and Substantiation for Public Input

Removed text is ambiguous/vague.

The current wording is like going to a mechanic and telling him to check the condition of your vehicle. What does the mechanic actually check? Lots of different things (filters, tires, brakes, fluids, etc.) and it may vary from mechanic to mechanic.

What exactly should the contractor be checking to determine a dry chemical agent's condition? Chemical composition, moisture content, moisture repellency, particle size distribution, bulk density, etc.? Is it totally up to the contractor or does this standard need to specify what exactly, at minimum, should be checked?

In my opinion, verifying the chemical composition and moisture content is the bare minimum.

The chemical composition, not just the type (agents of the same type can have different chemical compositions), needs to be verified to ensure the agent matches what is listed on the nameplate as required by the standard. To my understanding, the equipment has only ever been evaluated (i.e. listed) with the agent(s) listed on the nameplate. i.e. we have no idea if/how the extinguisher will work with any other agent. Using any other agent (or a mixture of agents, anything unlike the listed agent's chemical composition) voids the listing and no longer meets this standard.

Moisture content, one of the most common forms of contamination, is a benchmark used in most, if not all, standards concerned with the dry chemical inspection, testing, and maintenance. Moisture can lead to caking of the agent (which can lead to poor flow) and/or corrosion (and thus weakening) of the vessel.

When specifying what exactly needs to be checked, please consider how a contractor will do this. Most attributes can't be verified visually. What's more, not all product data sheets specify requirements for these attributes. Can we trust maintenance records? (i.e. last time the records state the extinguisher was filled with Manufacturer X's ABC agent, that must be what is in there/its chemical composition must be that of Manufacture X's ABC agent)

Submitter Information Verification

Submitter Full Name: Grant Lobdell
Organization: Dyne Technologies LLC
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 01 00:39:17 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: It is not practical during recharge to ensure that the chemical composition of the agent on the nameplate or agent identified in 7.8.3.1 is the same chemical composition of the agent inside the extinguisher. The dry chemical composition of the agent is proprietary. Additionally, the submitter has not provided a technical substantiation to show that the current process is inadequate and that chemical composition testing would result in substantial reduction of risk. The requirement of 7.8.3.1 already

covers the concern of using the same specified agent on the nameplate or proven equivalent agent.

Public Input No. 199-NFPA 10-2023 [Section No. 7.8.3.4.3]

7.8.3.4.3

Where doubt exists with respect to the ~~type, contamination, or condition~~ chemical composition or moisture content of the dry chemical, the dry chemical shall be discarded.

Statement of Problem and Substantiation for Public Input

Removed text is ambiguous/vague.

The current wording is like going to a mechanic and telling him to check the condition of your vehicle. What does the mechanic actually check? Lots of different things (filters, tires, brakes, fluids, etc.) and it may vary from mechanic to mechanic.

What exactly should the contractor be checking to determine a dry chemical agent's condition? Chemical composition, moisture content, moisture repellency, particle size distribution, bulk density, etc.? Is it totally up to the contractor or does this standard need to specify what exactly, at minimum, should be checked?

In my opinion, verifying the chemical composition and moisture content is the bare minimum.

The chemical composition, not just the type (agents of the same type can have different chemical compositions), needs to be verified to ensure the agent matches what is listed on the nameplate as required by the standard. To my understanding, the equipment has only ever been evaluated (i.e. listed) with the agent(s) listed on the nameplate. i.e. we have no idea if/how the extinguisher will work with any other agent. Using any other agent (or a mixture of agents, anything unlike the listed agent's chemical composition) voids the listing and no longer meets this standard.

Moisture content, one of the most common forms of contamination, is a benchmark used in most, if not all, standards concerned with the dry chemical inspection, testing, and maintenance. Moisture can lead to caking of the agent (which can lead to poor flow) and/or corrosion (and thus weakening) of the vessel.

When specifying what exactly needs to be checked, please consider how a contractor will do this. Most attributes can't be verified visually. What's more, not all product data sheets specify requirements for these attributes. Can we trust maintenance records? (i.e. last time the records state the extinguisher was filled with Manufacturer X's ABC agent, that must be what is in there/its chemical composition must be that of Manufacture X's ABC agent)

Submitter Information Verification

Submitter Full Name: Grant Lobdell
Organization: Dyne Technologies LLC
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 01 01:39:20 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The proposed text leaves out consideration of contamination which is an important aspect of the requirement. The current language covers the concern of chemical composition with "type" and the concern of moisture with "contamination."

Public Input No. 115-NFPA 10-2023 [Section No. 7.10]

7.10 Cabinets.

~~Missing breaker bars or hammers and broken, damaged, or missing break-front panels on fire extinguisher cabinets shall be replaced.~~

Fire extinguisher cabinets shall be maintained in working order at all times in accordance with the manufacturer's instructions.

7.10.1

Whenever damage is found to a cabinet it shall be immediately repaired in accordance with the cabinet manufacturer's instructions or guidance.

7.10.2

When the operating handles, knobs, front panels containing identification labels or symbols, tinted covers on exterior cabinets, hammers, breaker bars, or other operating tool or device is missing it shall be replaced immediately.

7.10.3

Fire resistance rated cabinets shall be maintained at all times to ensure the integrity of fire and smoke rated construction and the original listing or approval.

7.10.3.1

Where the doors, glass panels, or latches on fire resistance rated cabinets are missing ordamaged they shall be repaired or replaced in accordance with the manufacturer's instructions or guidance.

7.10.4

Exterior fire extinguisher cabinets shall be maintained according to the manufacturer's instructions to prevent damage to the extinguisher or the intrusion of water, dust, dirt, insects, or other contaminants.

7.10.5

Fire extinguisher cabinets shall not be used for the storage of any non-fire protection equipment.

7.10.6

Fire extinguisher bags and soft covers shall me maintained in good condition free of rips, tears, cuts, or damaged fasteners that could permit contaminant entry.

7.10.6.1

Fire extinguisher bags and soft covers that can not be repaired to restore contaminant free integrity shall be replaced.

7.10.6.2

Fire extinguisher bags and soft covers which are faded or have illegible markings shall be replaced.

Additional Proposed Changes

File Name	Description	Approved
10_PC36.pdf	10_PC36	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as “Reject but Hold” in Public Comment No. 36 of the (A2021) Second Draft Report for NFPA 10 and per the Regs. at 4.4.8.3.1.

There are no fire extinguisher cabinet maintenance requirements in Chapter 7 so now we have something to work from.

Submitter Information Verification

Submitter Full Name: TC ON PFE-AAA
Organization: NFPA TC ON Portable Fire Extinguishers
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 22 14:42:49 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fire extinguisher cabinets are not smoke rated. The proposed list of requirements are redundant to the cabinet manufacturer's maintenance instructions. Fire extinguisher cabinets are required to be listed.

Public Comment No. 36-NFPA 10-2020 [Section No. 7.10]

7.10 Cabinets.

~~Missing breaker bars or hammers and broken, damaged, or missing break-front panels on fire extinguisher cabinets shall be replaced.~~

Fire extinguisher cabinets shall be maintained in working order at all times in accordance with the manufacturer's instructions.

7.10.1

Whenever damage is found to a cabinet it shall be immediately repaired in accordance with the cabinet manufacturer's instructions or guidance.

7.10.2

When the operating handles, knobs, front panels containing identification labels or symbols, tinted covers on exterior cabinets, hammers, breaker bars, or other operating tool or device is missing it shall be replaced immediately.

7.10.3

Fire resistance rated cabinets shall be maintained at all times to ensure the integrity of fire and smoke rated construction and the original listing or approval.

7.10.3.1

Where the doors, glass panels, or latches on fire resistance rated cabinets are missing or damaged they shall be repaired or replaced in accordance with the manufacturer's instructions or guidance.

7.10.4

Exterior fire extinguisher cabinets shall be maintained according to the manufacturer's instructions to prevent damage to the extinguisher or the intrusion of water, dust, dirt, insects, or other contaminants.

7.10.5

Fire extinguisher cabinets shall not be used for the storage of any non-fire protection equipment.

7.10.6

Fire extinguisher bags and soft covers shall me maintained in good condition free of rips, tears, cuts, or damaged fasteners that could permit contaminant entry.

7.10.6.1

Fire extinguisher bags and soft covers that can not be repaired to restore contaminant free integrity shall be replaced.

7.10.6.2

Fire extinguisher bags and soft covers which are faded or have illegible markings shall be replaced.

Statement of Problem and Substantiation for Public Comment

There are no fire extinguisher cabinet maintaince requirements in Chapter 7 so now we have something to work from.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 38-NFPA 10-2020 [New Section after 7.13]	
Public Comment No. 38-NFPA 10-2020 [New Section after 7.13]	

Related Item

• FR # 53

Submitter Information Verification

Submitter Full Name: David Phelan
Organization: NFPA 10 Committee Member
Affiliation: Not Representing any Entity or Client
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 07 12:41:11 EDT 2020
Committee: PFE-AAA

Committee Statement

Committee Action: Rejected but held
Resolution: The proposed language is new material and is being held for the next revision cycle.

Public Input No. 46-NFPA 10-2022 [Section No. 7.10]

7.10 Cabinets.

~~Missing breaker bars or hammers and broken, damaged, or missing break-front panels on fire extinguisher cabinets shall be replaced.~~

Fire extinguisher cabinets shall be maintained in working order at all times in accordance with the manufacturer' instructions.

7.10.1 Whenever damage to a cabinet is found it shall be immediately repaired in accordance with the cabinet manufacturer's instructions or guidance.

7.10.2 When the operating handles, knobs, front panels containing identification labels or symbols, tinted covers on exterior cabinets, hammers, breaker bars, or other operating tool or device is missing it shall be replaced immediately with parts provided by or specified by the cabinet manufacturer.

7.10.3 Fire resistance rated cabinets shall be maintained at all times to ensure the integrity of fire and smoke rated construction and the original listing or approval.

7.10.3.1 Where the doors, glass panels, or latches on fire resistance rated cabinets are missing or damaged they shall be repaired or replaced in accordance with the manufacturer's instructions or guidance.

7.10.4 Exterior fire extinguisher cabinets shall be maintained according to the manufacturer's instructions to prevent damage to the extinguisher or the intrusion of water, dust, dirt, insects, or other contaminants.

7.10.5 Fire extinguisher cabinets shall not be used for the storage of any non-fire protection equipment.

7.10.6 Fire extinguisher bags and soft covers shall me maintained in good condition free of rips, tears, cuts, or damaged fasteners that could permit contaminant entry or delay removal.

7.10.6.1 Fire extinguisher bags and soft covers that can not be repaired to restore contaminant free integrity shall be replaced.

7.10.6.2 Fire extinguisher bags and soft covers which are faded or have illegible markings shall be replaced.

Statement of Problem and Substantiation for Public Input

This material was awarded Reject But Hold status at the last cycle and is presented here again for consideration. At present there is very little language in Chapter 7 for the ongoing maintenance of cabinets and bags, save for one line in 7.10. Field experience has shown that as time goes on cabinets become damaged, vandalized, or otherwise ineffective and repairs can be difficult to cite without language in Chapter 7 to support all which was required as part of the original installation in Chapter 6. This language also makes it clear that improvised or rudimentary field repairs are not appropriate and must instead follow the product manuals or manufacturer guidance.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 19:29:40 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: Fire extinguisher cabinets are not smoke rated. The proposed list of requirements are redundant to the cabinet manufacturer's maintenance instructions. Fire extinguisher cabinets are required to be listed.

Public Input No. 104-NFPA 10-2023 [Section No. 7.13.4.1]

7.13.4.1

New extinguishers requiring an initial charge in the field (such as pressurized water, ~~AFFF~~ foam , ~~FFFP,~~ or wet chemical extinguishers) shall not be required to have a verification-of-service collar installed.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:33:09 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-19-NFPA 10-2023
Statement: The term “foam” has been used to replace AFFF, FFFP and SFFF (which was proposed by public input) to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world. SFFF, while not currently used in portable fire extinguishers, is also a chemical foam.

Public Input No. 152-NFPA 10-2023 [Section No. 7.13.4.1]

7.13.4.1

New extinguishers requiring an initial charge in the field (such as pressurized water, AFFF, FFFP, EA, or wet chemical extinguishers) shall not be required to have a verification-of-service collar installed.

Statement of Problem and Substantiation for Public Input

Added language for Encapsulator Agent (EA) replacement consistent with other agents in the Standard

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 11:48:24 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: This has not been adopted because portable fire extinguishers with encapsulator agents are not listed and labeled, which does not comply with NFPA 10. NFPA 10 requires extinguishers to be listed and labeled and meet or exceed all the requirements of ANSI/UL 711, CAN/ULC-S508, Standard for the Rating and Fire Testing of Fire Extinguishers, and one of the performance standards, such as, ANSI/UL 8, CAN/ULC -S554, Water Based Agent Fire Extinguishers (reference NFPA 10, Section 4.1.1).

Public Input No. 79-NFPA 10-2023 [Section No. 8.1.2 [Excluding any Sub-Sections]]

Cylinders and cartridges bearing U.S. Department of Transportation (DOT) or Transport Canada (TC) markings shall be retested in accordance with the applicable DOT or TC regulations.

Revise to read

8.1.2 Cylinders and cartridges bearing U.S. Department of Transportation (DOT) or Transport Canada (TC) markings shall be requalified /retested in accordance with the applicable DOT or TC regulations.

Statement of Problem and Substantiation for Public Input:

DOT/TC uses the term “requalify” versus “retesting” which is commonly used in NFPA standards. This modification helps resolve confusion in the field.

Statement of Problem and Substantiation for Public Input

DOT/TC uses the term “requalify” versus “retesting” which is commonly used in NFPA standards. This modification helps resolve confusion in the field.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire E
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 14:38:10 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-29-NFPA 10-2023
Statement: DOT/TC uses the term “requalify” versus “retesting”. This revision helps resolve confusion for the user.

Public Input No. 135-NFPA 10-2023 [Section No. 8.3.1 [Excluding any Sub-Sections]]

At intervals not exceeding those specified in Table 8.3.1, fire extinguishers shall be hydrostatically retested.

Table 8.3.1 Hydrostatic Test Intervals for Extinguishers

Extinguisher Type	Test Interval (years)
Stored-pressure water, water mist, loaded stream, and/or antifreeze	5
Wetting agent	5
AFFF (aqueous film-forming foam)	5
FFFP (film-forming fluoroprotein foam)	5
Encapsulator Agent (EA)	5
Dry chemical with stainless steel shells	5
Carbon dioxide	5
Wet chemical	5
Dry chemical, stored-pressure, with mild steel shells, brazed brass shells, or aluminum shells	12
Dry chemical, cartridge- or cylinder-operated, with mild steel shells	12
Halogenated agents	12
Dry powder, stored-pressure, cartridge- or cylinder-operated, with mild steel shells	12

Statement of Problem and Substantiation for Public Input

Added language for Encapsulator Agent (EA) replacement consistent with other agents in the Standard.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 09:57:26 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-16-NFPA 10-2023

Statement: The term “foam” has been used to replace AFFF, FFFP and SFFF (which was proposed by public input) to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world. SFFF, while not currently used in portable fire extinguishers, is also a synthetic foam.

Encapsulator agent has not been added to the table since there is insufficient information to support including encapsulator agent.

Public Input No. 93-NFPA 10-2023 [Section No. 8.3.1 [Excluding any Sub-Sections]]

At intervals not exceeding those specified in Table 8.3.1, fire extinguishers shall be hydrostatically retested.

Table 8.3.1 Hydrostatic Test Intervals for Extinguishers

Extinguisher Type	Test Interval (years)
Stored-pressure water, water mist, loaded stream, and/or antifreeze	5
Wetting agent	5
AFFF (aqueous film-forming foam)	5
FFFP (film-forming fluoroprotein foam)	5
SFFF (synthetic fluorine-free foam)	5
Dry chemical with stainless steel shells	5
Carbon dioxide	5
Wet chemical	5
Dry chemical, stored-pressure, with mild steel shells, brazed brass shells, or aluminum shells	12
Dry chemical, cartridge- or cylinder-operated, with mild steel shells	12
Halogenated agents	12
Dry powder, stored-pressure, cartridge- or cylinder-operated, with mild steel shells	12

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:00:59 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-16-NFPA 10-2023
Statement: The term “foam” has been used to replace AFFF, FFFP and SFFF (which was proposed by public input) to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world. SFFF, while not currently used in portable fire extinguishers, is also a synthetic foam.

Encapsulator agent has not been added to the table since there is insufficient information to support including encapsulator agent.

Public Input No. 55-NFPA 10-2023 [Section No. 8.5.1.5]

8.5.1.5

All tests shall be conducted using **Approved** _ test fittings and adapters.

Statement of Problem and Substantiation for Public Input

Its only suggestion, as safety is more high priority so I would suggest that we need to add *Approved* in below clause before test,

8.5.1.5 All tests shall be conducted using test fittings and adapters.

Submitter Information Verification

Submitter Full Name: Yousuf Imran
Organization: Fire Engineering
Street Address:
City:
State:
Zip:
Submittal Date: Sun Jan 08 15:45:51 EST 2023
Committee: PFE-AAA

Committee Statement

Resolution: This is a defined term in NFPA 10, see 3.2.1 and its inclusion here may cause confusion for the user.

Public Input No. 80-NFPA 10-2023 [Section No. 8.8.2.1]

8.8.2.1

Condemned cylinders shall be stamped “CONDEMNED” on the top, head, shoulder, or neck with a steel stamp.

Revise section to read as follows

8.8.2.1 Condemned non specification cylinders shall be stamped “CONDEMNED” on the top, head, shoulder, or neck with a steel stamp.

8.8.2.1.1 Condemned non specification cylinders can alternately be rendered unusable by one of the following methods that include, drilling or burning a hole into the side of the cylinder or cutting the cylinder in half making them incapable of holding pressure.

8.8.2.1.2 The disposition of condemned specification cylinders shall be done in accordance with the applicable DOT or TC regulations.

Statement of Problem and Substantiation for Public Input:

The proposed section changes are necessary to clarify cylinder disposition requirements associated with non specification and specification type cylinders.

Statement of Problem and Substantiation for Public Input

The proposed section changes are necessary to clarify cylinder disposition requirements associated with non specification and specification type cylinders.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 14:41:55 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The substantiation of the Public Input does not provide a technical justification on why cylinder disposition requirements associated with non specification and specification type cylinders need to be clarified.

Public Input No. 137-NFPA 10-2023 [Section No. A.1.1]

A.1.1

Many fires are small at origin and can be extinguished by the use of portable fire extinguishers. Notification of the fire department as soon as a fire is discovered is strongly recommended. This alarm should not be delayed by awaiting results of the application of portable fire extinguishers.

Fire extinguishers can represent an important segment of any overall fire protection program. However, their successful functioning depends upon the following conditions having been met:

(1) The fire extinguisher is located in accordance with the requirements of Chapter 6 and is in working order.

(2) The fire extinguisher is of the correct type for a fire that can occur.

(3) The fire is discovered while still small enough for the fire extinguisher to be effective.

(4) The fire is discovered by a person ready, willing, and able to use the fire extinguisher.

Fixed systems are covered by the following NFPA standards:

(1) NFPA 11

(2) NFPA 12

(3) NFPA 12A

(4) NFPA 13

(5) NFPA 14

(6) NFPA 15

(7) NFPA 17

(8) NFPA 17A

(9) NFPA 18A

(10) NFPA 96

(11) NFPA 750

(12) NFPA 2001

Statement of Problem and Substantiation for Public Input

NFPA 10 has not previously referenced NFPA18A. NFPA 18A Encapsulating Agents offer another option for fire extinguisher agent.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 59-NFPA 10-2023 [Section No. 2.2]	

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 10:01:21 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: NFPA 18A addresses water additives that might be added to fixed systems but NFPA 18A is not a standard on fixed systems themselves. A.1.1 provides a list of NFPA standards that provide criteria for fixed systems.

Public Input No. 138-NFPA 10-2023 [New Section after A.3.3.16.2]

8.3.3.17

Encapsulator Agent (EA) - Encapsulator agents create spherical micelles that provide three key features 1) encapsulates fuel molecules separating fuel from the oxygen rendering the fuel non-flammable, non-inginitable and non explosive. 2) Modifies the heat reduction mechanism of a droplet creating the ability to absorb more heat per mass than a plain water droplet. 3) Interrupts free radicals greatly reducing the formation of toxic soot and smoke.

Statement of Problem and Substantiation for Public Input

Added language to provide examples of where Encapsulating Agents (EA) may be used.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 10:04:31 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The term “encapsulator agent” should be defined in NFPA 18A if it is an appropriate term to be defined, as it is a water additive. NFPA 10 does not define the agent but, rather, provide the requirements for types of extinguishers associated with classification of fire (Class A, B, etc.). Additionally, the term "encapsulator agent" does not appear in NFPA 10 and can therefore not be added to Chapter 3.

Public Input No. 14-NFPA 10-2022 [Section No. A.4.2]

A.4.2

Federal OSHA regulations require that manufacturers communicate information as to the type of chemicals in a product that can be hazardous and the level of hazard. This information is contained in the ~~MSDS~~ SDS created for each chemical or mixture of chemicals and is summarized on labels or tags attached to the product. Additionally, state and local authorities have enacted similar acts and regulations requiring identification of chemicals and hazardous ingredients in products. ~~MSDSs~~ SDSs for fire extinguisher agents are available on request from fire equipment dealers or distributors or the fire equipment manufacturer.

The identification of contents information enables determination of the type of chemicals contained in the fire extinguisher and helps to resolve complications arising from an unusual use of the agent. The *Hazardous Materials Identification System (HMIS)*, developed by the American Coatings Association, uses a three-place format with numerical indexes from 0 to 4. The first place is for “toxic properties,” the second place is for “flammability,” and the third place is for “reactivity” with other chemicals. Most fire extinguishers have a 0 numerical index in the second and third places because they are nonflammable and relatively inert.

Information on the HMIS can be obtained from Label Master, Inc., in Chicago, IL, or from the American Coatings Association in Washington, DC. Extinguisher contents information can be integrated into the standard fire extinguisher label in some form, or it can be on a separate label or tag. The following example is a typical chemical contents identification marking:

CONTENTS:

ABC DRY CHEMICAL/HMIS 1-0-0 MUSCOVITE MICA, MONOAMMONIUM PHOSPHATE AMMONIUM

SULFATE/NUISANCE DUST IRRITANT/CONTENTS

UNDER PRESSURE

[Manufacturer’s Name, Mailing Address, Phone Number]

Statement of Problem and Substantiation for Public Input

As of June 1, 2015, Material Safety Data Sheets (MSDS) were required to be replaced with Safety Data Sheets (SDS)

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 13-NFPA 10-2022 [Section No. 4.2]	

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
Zip:
Submittal Date: Fri Feb 11 10:26:10 EST 2022
Committee: PFE-AAA

Committee Statement

Resolution: FR-1-NFPA 10-2023

Statement: As of June 1, 2015, Material Safety Data Sheets (MSDS) were required to be replaced with Safety Data Sheets (SDS). This revision aligns with this change to SDS.

Public Input No. 179-NFPA 10-2023 [New Section after A.5.1]

A.5.2

Lithium-ion battery and lithium-ion battery energy storage system (BESS) fires are unique electrochemical fire hazards that involve multiple fire classes (Class A, Class B, Class C, Class D) within one entity. While BESS are covered by NFPA 855 , it should be noted that lithium-ion battery fires as a stand-alone hazard are not currently addressed in any NFPA standard. According to NFPA research reports, copious amounts of plain water are required to extinguish lithium-ion battery fires, and they can still exhibit thermal runaway up to 72 hours after initial extinguishment.

Water additive based on spherical micelle technology (encapsulator agents) conforming to Section 7.7 has been tested extensively by independent third-party testing organizations, including Kiwa, Dekra, Daimler, Dutech, Bosch, Fraunhofer University, and TU Clausthal. This testing has been controlled, scientific, and highly instrumented, documenting fire suppression, control and elimination of thermal runaway, and encapsulation of both flammable electrolyte and other explosive off-gases, rendering them nonexplosive. Encapsulating technology reduces the toxicity of HF gas exposure to humans.

In addition, the copious amounts of water used to suppress lithium-ion battery fires create copious amounts of run-off containing hydrofluoric acid, creating an environmental issue and expensive HAZMAT disposal cost. Compared to water, water additive solution uses a reasonable amount of solution and has been documented to modify the chemistry of the run-off, making it suitable for additional dilution and disposal in a municipal water treatment plant. Testing documentation can be found in the NFPA Research Library and Archives.

Statement of Problem and Substantiation for Public Input

This language has been included to provide context on developing extinguishing agents for use on lithium batteries, specifically encapsulating fire extinguishing agents. These agents typically consist of a solution of mineral-based particles suspended in water. When the agent is applied to a fire source, the water evaporates and the particles form a solid barrier around the flaming object(s), effectively separating the fuel from the surrounding oxygen which inhibits the combustion process Additionally, these agents generally have high heat capacities and are not electrically conductive. Encapsulator agents are currently under development, however, they have been shown to be particulalry effective in controlling and suppressing fires of lithium-ion batteries, eliminating thermal runaway, and reducing the explosion risk. These agents are recognized in the latest edition of NFPA 18A. UL is currently developing a certification for these types of agents. Since these agents are recognized by other NFPA standards, recognition of encapsulators by NFPA 10 is appropriate. This language has been extracted verbatum from Section A.4.3 of the 2022 Edition of NFPA 18A.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 18:25:33 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The introduction of this annex language does not provide usable information to the user of NFPA 10 because lithium-ion batteries are not a class of fire and at this time addressed within the document.

Public Input No. 28-NFPA 10-2022 [Section No. A.5.1]

A.5.1

Many Class A fires start as small fires that are often smoldering with little surface burning. A Class A fire that involves a flammable liquid is initially more intense and spreads rapidly. An example of this type of fire is where an open container of flammable liquid is spilled in a room containing furnishings and is ignited. The fire will rapidly involve combustible materials, including the furnishings in the vicinity of the spill. The flammable liquid works as an accelerant and speeds up the rate at which the fire spreads. There is a marked difference in the rates of flame spread where flammable liquids are involved in a combustible materials fire versus one involving only common combustibles. ~~Large-capacity extinguishers of 10 lb (4.54 kg) or greater and having a discharge rate of 1 lb/sec (0.45 kg/sec) or more are most appropriate for the protection of these hazards~~ For those reasons it is critical that the selection of any portable fire extinguisher be based on the methodology and specific factors detailed in Annex C 'Fire Extinguisher Selection'. At the present time there is no universal or 'all-purpose' fire extinguisher available so an informed decision making process must be applied to adequately address fire hazards and fire protection by portable fire extinguishers .

Statement of Problem and Substantiation for Public Input

The selection methodology for a fire extinguisher is covered in Annex C, not Annex A. High-flow (+1PPS) extinguishers are specifically indicated based on the existence of Class B challenge fires. There is no dataset, study, or post-fire reporting to show that high flow extinguishers, or the lack thereof, have been factors in an incipient stage Class A:B fire which does not involve Class B special hazards. If this language was actually needed or based on industry science then it belongs in the body of the text to be mandatory. This language doesn't address or resolve any known real-world problem but it will sure create urgency in the minds of readers thereby generating sales of high-flow extinguishers in occupancies where they have never been required, recommended, or needed.
Annex C C.2.6.1 already states 'Class B spill fire situations are typically capable of being handled by most Class-B rated fire extinguishers, if the proper discharge range is considered and the necessary unit size is properly matched to the fire hazard.' Given this statement and the historical knowledge gained that this statement accurately represents real-world conditions of Class B spill fires the more recently added Annex language calling out 10# high-flow extinguishers for spilled flammable liquid fires with Class A fuels present was when initially presented, and remains, wholly unsupported by testing or real-world case study. As presently written Annex A and Annex C are in conflict with each other for no reason other than a desire to generate new sales of high-flow rated fire extinguishers where this Code has never required or intended them to be required.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Sat May 21 10:25:32 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: The current language provides a reasonable recommendation to the user. A Class A fire that involves a flammable liquid is initially more intense and spreads rapidly. Large-capacity extinguishers of 10 lb (4.54 kg) or greater and having a discharge rate of 1 lb/sec (0.45 kg/sec) or more for the protection of Class A hazards and Class B hazards are specifically listed and labeled for use on Class A fires and Class B fires. This type of extinguisher is typically referred to as a “High Flow Extinguisher” associated with the extinguisher model designation in the listing information of Certification Organizations.

Public Input No. 139-NFPA 10-2023 [Section No. A.5.3.2.1]

A.5.3.2.1

Examples of extinguishers for protecting Class A hazards are as follows:

(1) Water type

(2) Halogenated agent type *(For halogenated agent–type fire extinguishers, see 5.3.2.6.)*

(3) Multipurpose dry chemical type

(4) Wet chemical type

(5) Encapsulator Agent (EA)

Statement of Problem and Substantiation for Public Input

Added language to allow Encapsulator Agents to be used on these types of fires.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 10:15:39 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: This has not been adopted because portable fire extinguishers with encapsulator agents are not listed and labeled, which does not comply with NFPA 10. NFPA 10 requires extinguishers to be listed and labeled and meet or exceed all the requirements of ANSI/UL 711, CAN/ULC-S508, Standard for the Rating and Fire Testing of Fire Extinguishers, and one of the performance standards, such as, ANSI/UL 8, CAN/ULC -S554, Water Based Agent Fire Extinguishers (reference NFPA 10, Section 4.1.1).

Public Input No. 140-NFPA 10-2023 [Section No. A.5.3.2.2]

A.5.3.2.2

Examples of extinguishers for protecting Class B hazards are as follows:

(1) Aqueous film-forming foam (AFFF)

(2) Film-forming fluoroprotein foam (FFFP)

(3) Carbon dioxide

(4) Dry chemical type

(5) Halogenated agent type *(For halogenated agent–type fire extinguishers, see 5.3.2.6.)*

(6) *Encapsulator Agent (EA)*

Statement of Problem and Substantiation for Public Input

Added language to allow Encapsulator Agents (EA) to be used on these types of fires.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 10:17:39 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: This has not been adopted because portable fire extinguishers with encapsulator agents are not listed and labeled, which does not comply with NFPA 10. NFPA 10 requires extinguishers to be listed and labeled and meet or exceed all the requirements of ANSI/UL 711, CAN/ULC-S508, Standard for the Rating and Fire Testing of Fire Extinguishers, and one of the performance standards, such as, ANSI/UL 8, CAN/ULC -S554, Water Based Agent Fire Extinguishers (reference NFPA 10, Section 4.1.1).

Public Input No. 141-NFPA 10-2023 [New Section after A.5.3.2.4]

Class L- Lithium Ion Batteries

Example of fire extinguishers that have been proven to effective on Lithium Ion battery hazards:

1) Encapsulator Agent (EA) fire extinguisher- in leu of any Nationally recognized listing and acceptance test protocol for fire extinguishers on Class L- Lithium Ion battery hazard Dutch standard NTA 8133:2021, Portable Fire Extinguishers- Performance requirements, tests methods and marking for suitability for extinguishing Lithium Battery Fires. Also reference NFPA 18A, A4.3: Lithium Ion Battery Application.

Statement of Problem and Substantiation for Public Input

Added information that pertains to the newly defined Class L fires.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 143-NFPA 10-2023 [New Section after 2.3]	Related by definition of the new Class L and referenced documents

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 10:20:53 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10.

Public Input No. 32-NFPA 10-2022 [Section No. A.5.4.1.2]

A.5.4.1.2

Ordinary hazard occupancies could consist of dining areas, mercantile shops and allied storage, light manufacturing, research operations, auto showrooms, ~~parking garages,~~ workshop or support service areas of light hazard occupancies, and warehouses containing Class I or Class II commodities as defined by NFPA 13.

A Class I commodity is defined by NFPA 13 as a noncombustible product that meets one of the following criteria:

(1) It is placed directly on wooden pallets.

(2) It is placed in single-layer corrugated cartons, with or without single-thickness cardboard dividers, with or without pallets.

(3) It is shrink-wrapped or paper-wrapped as a unit load, with or without pallets.

A Class II commodity is defined by NFPA 13 as a noncombustible product that is in slatted wooden crates, solid wood boxes, multiple-layered corrugated cartons, or equivalent combustible packaging material, with or without pallets.

Statement of Problem and Substantiation for Public Input

Vehicle parking structures or garages have become the focus of recent study and loss analysis which indicates the presence of liquid fuels and Class A high BTU materials such as plastics, foamed rubbers, and synthetics contribute to rapid fire development and spread due to the close spacing of parked vehicles. This fire loss data and study by the NFPA and ICC has led to code changes in the protection of open parking structures which were previously thought to be 'low hazard'. Additional features such as vehicle stackers, charging stations, and a growing desire by industry to perform mobile fuel delivery inside of parking structures is further increasing the hazard and fire potential. Given that a single vehicle with a non-metallic fuel tank can easily contribute more than 5 gallons to any incipient stage fire the use of Extra Hazard selection and travel distance rules is appropriate.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 33-NFPA 10-2022 [Section No. A.5.4.1.3]	
Public Input No. 33-NFPA 10-2022 [Section No. A.5.4.1.3]	

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed May 25 16:33:47 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: FR-4-NFPA 10-2023

Statement: Removing parking garages from the annex for ordinary hazard, aligns with section 5.4.1.2 and 5.4.1.3 which identifies the presence of flammables in quantities from 1 gal to 5 gal or in quantities of 5 gallons or more in any room or area. Given that a single vehicle with a non-metallic fuel tank can easily contribute more than 5 gallons to any incipient stage fire the use of Extra Hazard selection and travel distance rules is appropriate.

Public Input No. 33-NFPA 10-2022 [Section No. A.5.4.1.3]

A.5.4.1.3

Extra hazard occupancies could consist of woodworking; motor vehicle repair; motor vehicle parking; aircraft and boat servicing; cooking areas; individual product display showrooms; product convention center displays; and storage and manufacturing processes such as painting, dipping, and coating, including flammable liquid handling. Also included is warehousing or in-process storage of other than Class I and Class II commodities.

Statement of Problem and Substantiation for Public Input

Vehicle parking structures or garages have become the focus of recent study and loss analysis which indicates the presence of liquid fuels and Class A high BTU materials such as plastics, foamed rubbers, and synthetics contribute to rapid fire development and spread due to the close spacing of parked vehicles. This fire loss data and study by the NFPA and ICC has led to code changes in the protection of open parking structures which were previously thought to be 'low hazard'. Additional features such as vehicle stackers, charging stations, and a growing desire by industry to perform mobile fuel delivery inside of parking structures is further increasing the hazard and fire potential. Given that a single vehicle with a non-metallic fuel tank can easily contribute more than 5 gallons to any incipient stage fire the use of Extra Hazard selection and travel distance rules is appropriate.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 32-NFPA 10-2022 [Section No. A.5.4.1.2]	
Public Input No. 32-NFPA 10-2022 [Section No. A.5.4.1.2]	

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Group, Entity, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed May 25 16:44:21 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: FR-5-NFPA 10-2023

Statement: Adding "parking garage" to the annex for extra hazard better aligns with section 5.4.1.2 and 5.4.1.3 that identifies the presence of flammables in quantities from 1 gal to 5 gal or in quantities of 5 gallons or more in any room or area. Given that a single vehicle with a non-metallic fuel tank can easily contribute more than 5 gallons to any incipient stage fire the use of Extra Hazard selection and travel distance rules is appropriate.

Public Input No. 153-NFPA 10-2023 [Section No. A.5.5.4.2]

A.5.5.4.2

A three-dimensional Class B fire involves Class B materials in motion, such as pouring, running, or dripping flammable liquids, and generally includes vertical as well as one or more horizontal surfaces. Fires of this nature are considered to be a special hazard. The system used to rate fire extinguishers on Class B fires (flammable liquids in depth) is not directly applicable to this type of hazard. The installation of fixed systems utilizing an NFPA 18A, 7.7 Encapsulator Agent (EA) tested and listed in accordance with NFPA 18A, section 7.5 should be considered where applicable.

Statement of Problem and Substantiation for Public Input

Added language to allow the use of Encapsulator Agent (EA) to be used on these types of fires.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 12:05:19 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: There is insufficient information to support water based agent fire extinguishers as being effective at suppressing and extinguishing three-dimensional fires. Portable fire extinguishers used to comply with NFPA 10 shall be listed and labeled (not approved).

Public Input No. 30-NFPA 10-2022 [Section No. A.5.5.4.5]

A.5.5.4.5

Fire extinguishers for cooking media (vegetable or animal oils and fats) traditionally followed Table 6.3.1.1 for extra hazard, requiring a minimum 40-B-rated sodium bicarbonate or potassium bicarbonate dry chemical extinguisher. The evolution of high-efficiency cooking appliances and the change to hotter-burning vegetable shortening has created a more severe fire hazard. Testing has shown that wet chemical extinguishers have several times the cooking fire–extinguishing capability of a minimum 40-B-rated sodium bicarbonate or potassium bicarbonate dry chemical extinguisher, which has prompted the creation of a new classification and a new listing test protocol. The test protocol is found in UL 711, CAN/ULC-S508.

See NFPA 96 for further information. Persons in cooking areas need specific training on the use of extinguishers as an essential step for personal safety. Class K fire extinguishers equipped with extended wand–type discharge devices should not be used in a manner that results in subsurface injection of wet chemical extinguishing agents into hot cooking media. Subsurface injection causes a thermodynamic reaction comparable to an explosion. Class K fire extinguishers are no longer manufactured with extended wand–type discharge devices.

Class K portable fire extinguishers are not intended to be used as the first line of defense for cooking fires where a fixed chemical suppression system is present. Where fixed fire suppression systems are present it is imperative that they be activated, automatically or manually, prior to the application of portable fire extinguishers. When there is no fixed chemical suppression system such as common with temporary and outdoor cooking operations the Class K portable fire extinguisher is the only provided fire protection equipment and must be used for first line defense.

Statement of Problem and Substantiation for Public Input

The reference to Section 5.5.4.5 assumes the presence of fixed fire protection systems in the cooking area serving as the first line of fire defense. While this is valid when fixed systems are present it is very common for temporary cooking operations to occur in the absence of fixed systems and therefore Class K extinguishers are provided for first line fire defense.

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed May 25 16:08:41 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: This revision has not been adopted since NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, 2024 already indicates where and when Class K (or other) fire extinguishers are to be used. NFPA 96 is the more appropriate document to provide requirements and annex material on the proper use of Class K fire extinguishers.

Public Input No. 108-NFPA 10-2023 [Section No. A.5.5.4.6]

A.5.5.4.6

Where occupancies are required to have extinguishers installed, 5.5.4.6 is applicable to areas where ~~the~~ energized electronic equipment ~~is located. Delicate electronic equipment includes, but is not limited to, telecommunications, computers, servers, robotics, and reproduction equipment.~~

~~Extinguishers provided for the protection of delicate electronic equipment are typically halogenated agent and water mist extinguishers with Class A ratings.~~

fires can occur.

Statement of Problem and Substantiation for Public Input

1. There is no specific definition for delicate electronic equipment.

2. Today a very broad scope of electronic equipment exist that can be considered delicate.

3. Existing language technically prohibits the use or placement of dry chemical extinguisher models within most common occupancies and applications, presenting liability issues.

4. Section requirements should only apply to potentially energized electronic equipment fire can occur and not applications where packaged or stored electronic equipment is simply present.

5. Code requirement objectives have always addressed minimum necessary fire safety and extinguishment needs and not dictate the owner's equipment exposure clean up and/or replacement decisions. The 72 other NFPA standards identified within chapter two already address special occupancy and hazard extinguisher recommendations where specifically desired agent types can be dictated.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 17:13:39 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-20-NFPA 10-2023
Statement: This revision provides clarity to the user on what should and should not be considered delicate electronic equipment in NFPA 10.

Public Input No. 41-NFPA 10-2022 [Section No. A.5.5.4.6]

A.5.5.4.6

Where occupancies are required to have extinguishers installed, 5.5.4.6 is applicable to areas where the ~~electronic~~ life safety or mission critical electronic equipment is located. ~~Delicate electronic equipment includes, but is not limited to, telecommunications, computers, servers, robotics, and reproduction equipment.~~ When life safety or mission critical equipment is compromised it can have immediate and detrimental impact for occupants, infrastructure, and remote operations. While it is important to extinguish any incipient stage fire in these types of environments it is also important to limit to collateral impact to adjacent equipment, controls, or systems which commonly occur from dry chemical agent residues. Nothing in NFPA 10 prohibits an owner or operator from protecting other electronic equipment in the same manner but that is a decision outside the scope of NFPA 10.

Extinguishers provided for the protection of ~~delicate electronic~~ life safety or mission critical electronic equipment are typically ~~halogenated agent and water mist extinguishers with Class A ratings~~ agents with no or non-corrosive residues that are suitable for both Class A and Class C fires .

Statement of Problem and Substantiation for Public Input

Attempts to bring clarity to the concerns and goals of NFPA 10 with regard to protecting electronic equipment previously described as 'delicate'.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 39-NFPA 10-2022 [Section No. 5.5.4.6.1]	
Public Input No. 40-NFPA 10-2022 [Section No. 5.5.4.6.2]	

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 18:23:09 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: FR-20-NFPA 10-2023

Statement: This revision provides clarity to the user on what should and should not be considered delicate electronic equipment in NFPA 10.

Public Input No. 109-NFPA 10-2023 [Section No. A.5.5.4.6.2]

A.5.5.4.6.2 — 1 __

Dry chemical residue will probably not be able to be completely and immediately removed ~~, and~~ from electronics that are not sealed or weather proof, and , in addition, multipurpose dry chemical types exposed to temperatures in excess of 250°F (121°C) or relative humidity in excess of 50 percent can cause corrosion. The use of other clean agent types of extinguishing agents can help to minimize or eliminate collateral equipment damage and associated clean-up concerns. Other NFPA standards identified in Chapter 2 may address special electronic equipment protection needs and dictate specific fire extinguisher and agent requirements.

Statement of Problem and Substantiation for Public Input

1. There is no specific definition for delicate electronic equipment.

2. Today a very broad scope of electronic equipment exist that can be considered delicate.

3. Existing language technically prohibits the use or placement of dry chemical extinguisher models within most common occupancies and applications, presenting liability issues.

4. Section requirements should only apply to potentially energized electronic equipment fire can occur and not applications where packaged or stored electronic equipment is simply present.

5. Code requirement objectives have always addressed minimum necessary fire safety and extinguishment needs and not dictate the owner's equipment exposure clean up and/or replacement decisions. The 72 other NFPA standards identified within chapter two already address special occupancy and hazard extinguisher recommendations where specifically desired agent types can be dictated.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 17:20:41 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-48-NFPA 10-2023
Statement: The annex has been moved to a more precise reference within NFPA 10, Chapter 5. This revision provides more guidance in regards to which electronic equipment should be considered delicate.

Public Input No. 36-NFPA 10-2022 [New Section after A.5.5.5.1]

A 5.5.5.2

It is common for NFPA 10 and other NFPA codes or standards to prescribe fire extinguisher size, rating, classification, location, and travel distances which may not be exactly correlated. This section does not prevent or limit any other NFPA code or standard Committee from specifying a fire extinguisher requirement which is more restrictive than NFPA 10. In no case however shall another NFPA code or standard Committee author a fire extinguisher requirement which provides less protection, fire fighting capability, or requires increased travel distance or spacing that what is contained in NFPA 10.

Statement of Problem and Substantiation for Public Input

If 5.5.5.2 is preserved and remains in NFPA 10 then there needs to be Annex language which explains this Committee's concern or reason for creating the language. It would also be helpful to know who is responsible for enforcing the requirement if another NFPA Committee was to err and violate the requirement.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 22-NFPA 10-2022 [Section No. 5.5.5.2]	
Public Input No. 22-NFPA 10-2022 [Section No. 5.5.5.2]	

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group or Special Interest.
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 17:40:39 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: The requirements given in NFPA 10 are a minimum, see 1.1.1. Where other NFPA standards reference the requirements of NFPA 10 in whole or in part does not imply a conflict. The submitter has also not identified existing conflicts between NFPA 10 and other NFPA documents, which would facilitate the need of a change to this section.

Public Input No. 47-NFPA 10-2022 [Section No. A.6.1.3.11]

~~A.6.1.3.11~~ —

~~In addition to providing storage, extinguisher cabinets provide protection for extinguishers and prevent accidental bumping. The cabinet cavity must be big enough to accommodate the extinguisher, so the extinguisher must be selected before selecting the cabinet. The final selection of the cabinet should allow adequate room for the extinguisher to be easily removed.~~

~~Fire extinguishers in cabinets can be monitored for tampering or theft by means of a switch and local alarm to indicate when the extinguisher is removed from the cabinet.~~

Statement of Problem and Substantiation for Public Input

Cabinet sizing to ensure the extinguisher is readily removeable is not Annex material, it belongs in the body of NFPA 10. It is inappropriate to merely suggest in supplemental language that the cabinet must be sized for the extinguisher.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 24-NFPA 10-2022 [Sections 6.1.3.11.1.1, 6.1.3.11.1.2]	
Public Input No. 24-NFPA 10-2022 [Sections 6.1.3.11.1.1, 6.1.3.11.1.2]	

Submitter Information Verification

Submitter Full Name:	David Phelan
Organization:	Stafford Township
Affiliation:	Friend of the Code - Not Representing Any Entity, Group, or Special Interest
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu May 26 19:38:28 EDT 2022
Committee:	PFE-AAA

Committee Statement

Resolution: This proposal is related to Public Input #24 which added the annex language as a requirement. NFPA 10 is a selection, maintenance, and installation document. The annex of 6.1.3.11 adequately covers the proposed new section of 6.1.3.11.1.3 without making requirements on the manufacturing of cabinets which is outside the scope of NFPA 10.

Public Input No. 94-NFPA 10-2023 [Section No. A.6.1.3.12]

A.6.1.3.12

The following precautions should be noted where fire extinguishers are located in areas that have temperatures outside the range of 40°F to 120°F (4°C to 49°C):

(1) ~~AFFF and FFFP~~ Foam fire extinguishers cannot be protected against temperatures below 40°F (4°C) by adding an antifreeze charge, because it tends to destroy the effectiveness of the extinguishing agent.

(2) Plain water fire extinguishers should not be protected against temperatures below 40°F (4°C) with ethylene glycol antifreeze. Calcium chloride solutions should not be used in stainless steel fire extinguishers.

(3) Fire extinguishers installed in machinery compartments, diesel locomotives, automotive equipment, marine engine compartments, and hot processing facilities can easily be subjected to temperatures above 120°F (49°C). Selection of fire extinguishers for hazard areas with temperatures above the listed limits should be made on the basis of recommendations by manufacturers of this equipment.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:03:16 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-8-NFPA 10-2023
Statement: There are several different types of foam fire extinguishers listed and labeled for this type of application. This revision covers all listed and labeled foam fire extinguishers.

Public Input No. 154-NFPA 10-2023 [New Section after A.6.5.1]

6.5.2

Where Class L fire hazard exist, these fires are unique electrochemical fire hazards that involve multiple fire classes (Class A, Class B, Class C, Class D) within one entity. It should be noted that lithium-ion battery fires as a stand-alone hazard are not currently addressed in any NFPA standard. According to NFPA research reports, copious amounts of plain water are required to extinguish lithium-ion battery fires, and they can still exhibit thermal runaway up to 72 hours after initial extinguishment.

Water additive based on spherical micelle technology (Encapsulator Agents (EA)) conforming to Section 7.7 has been tested extensively by independent third-party testing organizations, including Kiwa, Dekra, Daimler, Dutech, Bosch, Fraunhofer University, and TU Clausthal, Beijing Institute of Technology, National Institute of Occupational Safety and Health (NIOSH) . This testing has been controlled, scientific, and highly instrumented, documenting fire suppression, control and elimination of thermal runaway, and encapsulation of both flammable electrolyte and other explosive off-gases, rendering them nonexplosive. Encapsulating technology reduces the toxicity of HF gas exposure to humans.

In addition, ABC dry powered and foam fire extinguishers have been 3rd party tested and proven to be ineffective on Lithium Ion battery hazards.

Additional Proposed Changes

File Name	Description Approved
NIOSH_F-500_report.pdf	NIOSH testing report
Technical_University_of_Clausthal_Test_English_.pdf	Clausthal Report
TR_F5_AM_2017_Research_Development_of_Fire_Extinguishing_Technology_for_Lithium-ion_Batteries_China.pdf	Beijing report
TR_F5_AM_Kiwa_Nederland_BV_Lithium_Ion_Battery_Fire_Extinguishment_Testing_Final_Report.pdf	KIWA report

Statement of Problem and Substantiation for Public Input

Added information on the new Class L fires to be consistent with other Classes of fire.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 12:19:13 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Class L is not a recognized type of fire and therefore cannot be included in NFPA 10. The annex language is also not relevant to the mandatory requirement of 6.5.2. Encapsulator agent has not been added since there is insufficient information to support including encapsulator agent.

TU Clausthal

EST
Forschungszentrum
Energiespeichertechnologien

Forschungszentrum Energiespeichertechnologien • Am Stollen 19A • 38640 Goslar

Prof. Dr. Wolfgang Schade

Telefon: (0 53 21)3816-8410
wolfgang.schade@tu-clausthal.de

Ihr Zeichen/Ihr Schreiben vom	Mein Zeichen/Mein Schreiben vom	Clausthal-Zellerfeld, den
	EST/ FS	3.7.2020

Report

Mixture of water and 2% F500 as extinguishing agent for deletion of lithium-ion-battery fire

1. Preparation of lithium-ion battery package

For all extinguishing experiments we used a lithium-ion battery package with a total storage energy of 1890 Wh (48V, 39Ah) The module consists of 182 parallel and serial connected round cell batteries, the total weight of the module is 10.5 kg.

The thermal trigger of an accident was induced by two glow plugs integrated into the battery package. The glow plugs are operated with a voltage of 12V and a current of 15A. This setup allows the generation of temperatures up to 1400 °C within 1 minute after ignition of the plugs. The battery module is fitted by 8 temperature sensors (type k sensors). The temperature sensors are located on the top and bottom side of the package, two sensors directly close to the glow plugs and two sensors on the edge of the package. The covered temperature range is 20- 1400 °C with an accuracy of about +- 1 °C. Figure 1 shows the arrangement of glow plugs and temperature sensors on the top side of the battery module. Temperature sensors on the bottom side are located at same places.

Vorstandsvorsitzender:
Prof. Dr. Wolfgang Schade

Administrativer Geschäftsführer:
Dr. Jens-Peter Springmann

Besucheranschrift:
Am Stollen 19A
38640 Goslar

Telefon: (0 53 21) 3816 - 8000
Telefax: (0 53 21) 3816- 8009
info-est@tu-clausthal.de
http://www.est.tu-clausthal.de

Bankverbindung:
Technische Universität Clausthal
Sparkasse Hildesheim Goslar Peine
IBAN: DE71259501300000022111
Swift/BIC Code: NOLADE21HIK

USt.-Ident-Nr. DE811282802

Mitglied im

efzn
Energie-Forschungszentrum
Niedersachsen

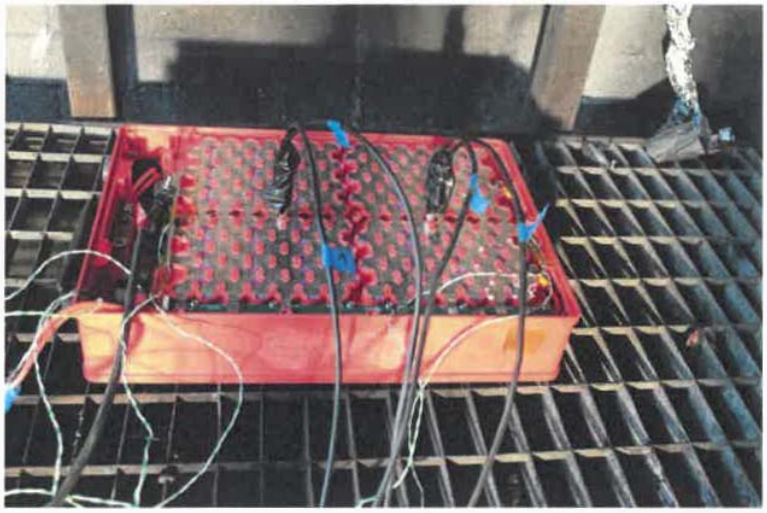


Figure 1: Lithium-ion battery package (1.89 KWh) with integrated glow plugs for thermal trigger of an accident and temperature sensors integrated into the package.

2. Experiments

The experiments for thermal runaway and attempts to delete the induced fire are performed in a test chamber with connected gas cleaning system. Above the battery package at a distance of 0.5 m there are two nozzles mounted that allow a well defined injection of the extinguishing agent F500 (refer to fig. 2 and 3). The extinguishing agent consists of a mixture of pure water and 2% F500. In addition to the 8 temperature sensors a digital camera was installed in the chamber for monitoring and documentation of the experiment and also a thermal camera for measuring the thermal distribution on top of the battery package. This allows real-time monitoring of the thermal runaway in the chamber, the data rate of the monitoring system was 10 Hz. All data are transmitted in real-time to the control room and the extinguishing system was operated manually, depending on the progress of the thermal runaway. As an example, the measurement protocol as distributed to the control room is shown in fig. 4.

Figure 2: View into the test chamber after inducing a thermal runaway by ignition of the two glow plugs. Above the battery package the two nozzles for introduction of the extinguishing agent (water and 2% F500) are shown.

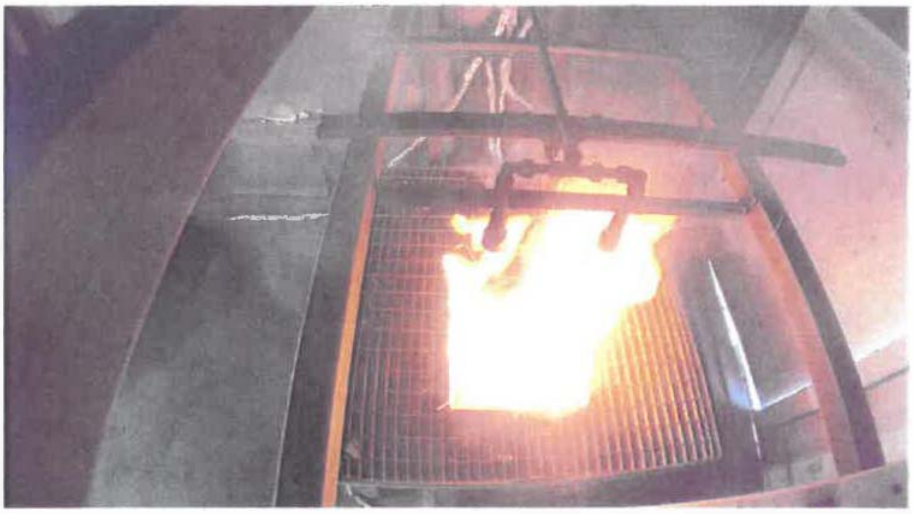


Figure 3: View on top of the battery package during the thermal runaway.

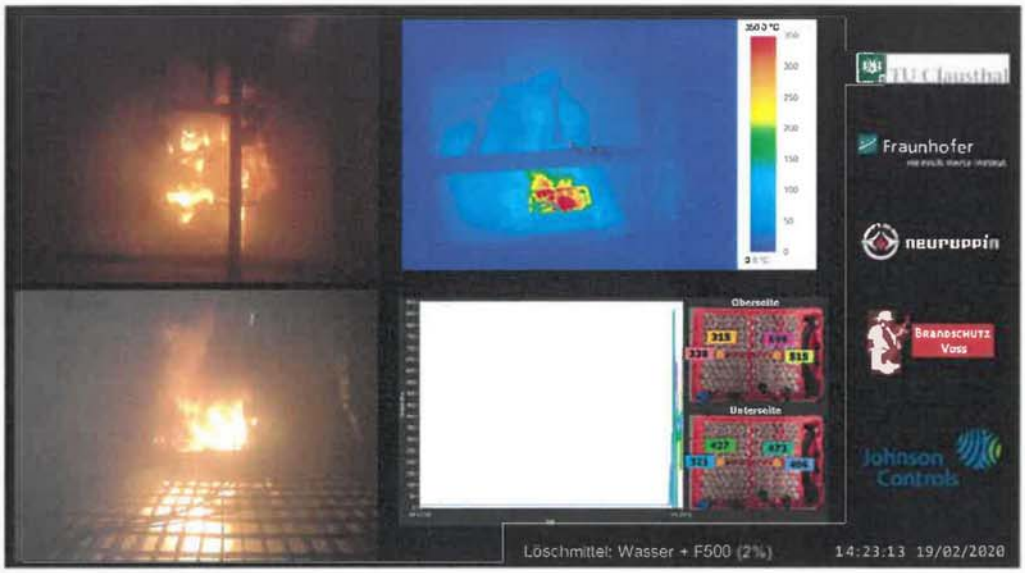


Figure 4: Example of the measurement protocol as can be seen in real time during the experiment in the control room. On the top, right side there is the image of the thermal camera shown, below the arrangement of the temperature sensors and corresponding data.

In the following we show a typical temporal development of the experiment:

15:05:57	Start, heating with glow plug (U=12V, i=15A)
15:06:15	Temperature increases for sensors close to glow plug
15:06:33	first smoke appears
15:06:57	Explosion of the battery package
15:07:02	Power supply for heating glow plugs off
15:07:34	Start of flame formation at battery package
15:08:02	First short fire extinguishing (water and 2% FS00) pulse (duration 5 sec), instant reduction of flame
15:08:25	new but much less flame formation
15:08:33	short fire extinguishing pulse (duration 5 sec), no flames
15:11:27	again short fire extinguishing pulse (duration 5 sec), no flames anymore
15:14:44	Temperature of sensore decrease continuously down to T<80 °C, no new flame/fire formation
15:18:27	again short fire extinguishing pulse (duration 5 sec)
15:33:55	Temperature down to T <50°C, End of experiment

Figure 5 shows the battery package at end of experiment.

Figure 5: Battery package at the end of the experiment.

The temporal distribution of the temperature for all 8 sensors is shown in fig. 6. After inducing a thermal runaway by heating with glow plugs an instant temperature increase up to 1400 °C is obtained. After introduction of a first fire extinguishing pulse (mixture of water with 2% F500, duration 5 sec) the temperature decreases down to 400 °C and after a second extinguishing pulse (5 sec duration) a continuous decrease of the temperature is obtained. In all experiments no second fire formation was obtained after introduction of an extinguishing pulse as described before. When using 4.5 liters of extinguishing agent (mixture of water and 2% F500) the battery fire was completely deleted and no new flame formation was detected anymore.

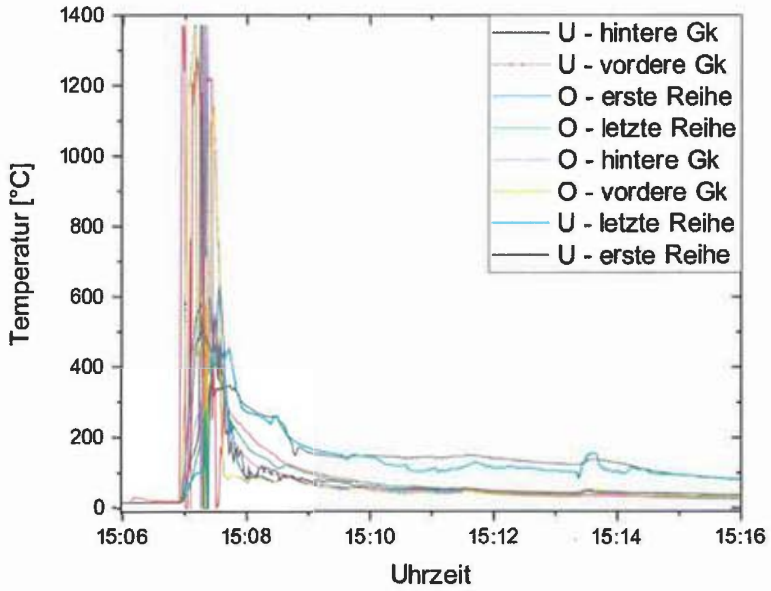


Figure 6: Temporal distribution of temperature measured by the sensors from starting thermal runaway up to complete deletion of the battery fire.

3. Summary

The addition of F500 (2%) to water as an extinguishing agent results in significant reduction of surface tension contrary to pure water without F500. As a result, when applying the mixture of water and 2% F500 on the battery package the extinguishing agent covers the package as a thin film on all surface sides – which does not happen when using pure water. Due to the high temperature (T>1300 °C) the extinguishing agent evaporates and the energy necessary for this process comes from the hot battery package. As a result, the package cooles down very efficiently which is obtained in the temperature profiles (refer to fig. 6). Since the extinguishing agent covers all surfaces due to the reduced surface tension a very fast and efficient cooling process is obtained and no new flame formation is obtained. Finaly, the fire is completely deleted.

Further experiments that we have performed with another lithium-ion battery package (2 kWh storage energy) supports the interpretation of our results reported above. Again a thermal runaway was introduced to the battery package in a way described before and the we tried to delete the flame formation of the battery by using 50 liter pure water as extinguishing agent. However, this experiment failed. Even after longer time (t < 20 min) there was continuously new flame formation obtained. In a second step the same experiment was performed, but now using a mixture of water and 2% F500 as extinguishing agent. Now after application of 5 liter of such mixture the fire was completely deleted and no new flame formation was obtained anymore.

Conclusion:

Using a mixture of water with 2% F500 as extinguishing agent for deletion of lithium-ion battery fire is significantly superior to using only pure water. There is less need of the extinguishing agent and there is no new fire/flame formation for experimental conditions as described before. When using 4.5 liters of a mixture of water and F500 lithium-ion battery fires (1.89 kWh/48V, 39 Ah/182 cells Type 18650, weight of the package 10.5 kg) can be deleted completely without any new fire/flame formation.

3.7.2020

Prof. Dr. W. Schade

Mining, Metallurgy & Exploration
https://doi.org/10.1007/s42461-023-00765-7

Comparison of Fire Suppression Techniques on Lithium-Ion Battery Pack Fires

Wei Tang[1] · Liming Yuan[1] · Richard Thomas[1] · John Soles[1]

Received: 5 December 2022 / Accepted: 25 April 2023

Abstract
Lithium-ion battery pack fires pose great hazards to the safety and health of miners. A detailed experimental study has been conducted at the National Institute for Occupational Safety and Health (NIOSH) Pittsburgh Mining Research Division (PMRD) to investigate the effectiveness of different fire suppression systems on Li-ion battery pack fire extinguishment. Tests were conducted in a well-ventilated container. Two sizes of battery packs (12 V, 24 V) were heated by heater strips to trigger thermal runaway and fire. Water mist with different flow rates, ABC powder, type D dry chemical, and water mist with F500 additives were used as the fire suppression agents. Multiple thermocouples were installed on the battery packs to measure the temperature evolution during the tests. The results indicated that the water mist with F500 additives is the most effective suppressant among the agents tested. Dry chemicals, however, do quench the fire for a moment, but cannot prevent re-ignition of the battery since they do not provide enough cooling. The findings of this paper can be used to develop safer battery fire suppression techniques in mining environments.

Keywords Lithium-ion battery · Fire suppression · Water mist · Dry chemical

1 Introduction

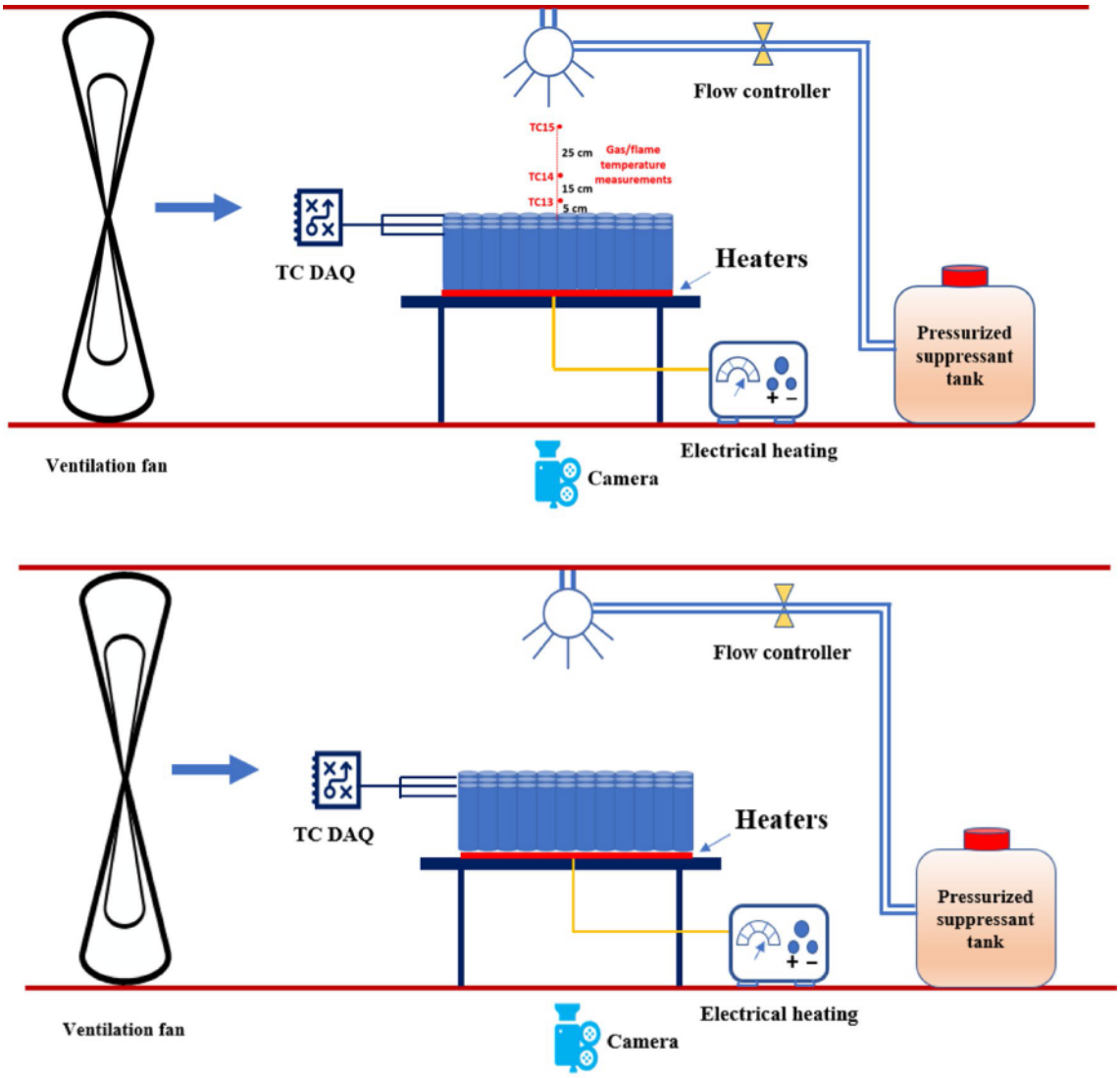
As an important alternative to fossil fuels, lithium-ion (Li-ion) batteries have seen their applications growing from consumer electronic products to large electric vehicles. In the mining industry, Li-ion battery powered electric vehicles (BEVs) are believed to be a promising replacement for diesel-powered vehicles whose emission of diesel particulate matter (DPM) is a major concern to the safety and health of miners [1]. The introduction of BEVs into the mining industry has not been trouble-free as the potential use of Li-ion BEVs in gassy underground mines escalates the fire and explosion risks [1]. Methane-air mixtures are found in many types of mines, and the energy released by a Li-ion battery during thermal runaway or accidents resulting in fire can be an ignition source for such mixtures [2, 3]. A safer and more reliable design and application of Li-ion BEVs could help reduce and mitigate the risk of fire and explosion accidents underground. The size of a battery pack fire can be indicated by the heat release rate (HRR). Wang et al. [4] used cone calorimetry tests and found that the peak HRR and total heat release increase with state of charge of the battery. Most of the HRR measurement of battery fires used the oxygen consumption theory [5, 6].

While preventing the fire and explosion of Li-ion batteries from occurring is necessary, suppression of such incidents when they occur is just as vital [7, 8]. In a mining environment where fire suppression resources are limited, an effective battery fire suppression technique is critical to the safety and health of miners. Numerous studies have been conducted to investigate the effectiveness of traditional fire suppression techniques on battery or battery pack fires. Unlike traditional fire suppression, battery fire suppression requires extensive cooling even after the fire is visually quenched [9-12] to reduce battery temperature and prevent re-ignition due to chemical reactions inside the batteries. Liu et al. [13] found that water mist can well control the thermal runaway of a battery by cooling the battery below a certain critical temperature. Larsson et al. [14] reported that the effectiveness of water mist on battery fire suppression is not obvious, and that hydrogen fluoride concentration increased after the application of water mist. Blum et al. [15] conducted large-scale

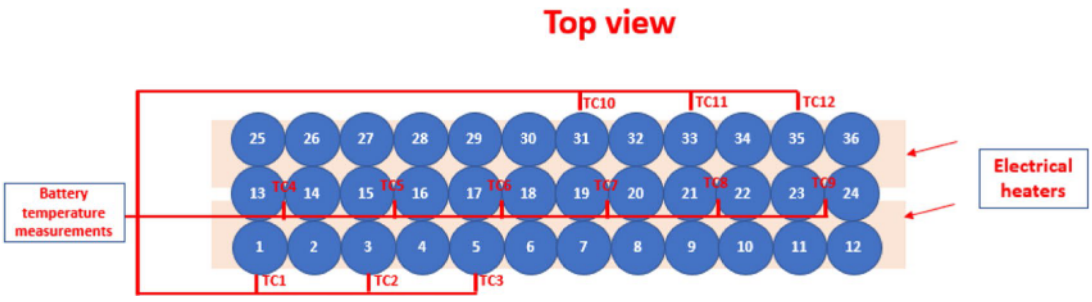
✉ Wei Tang
Ope0@cdc.gov

[1] Pittsburgh Mining Research Division, National Institute for Occupational Safety and Health, 626 Cochrans Mill Road, Pittsburgh, PA 15236, USA

Published online: 04 May 2023



a. Test setup in the facility



b. Top view of measurement on battery pack

Fig. 1 Battery fire suppression test setup

Table 1 Test conditions

Test number	Battery size	Agent
1	12 V	Free burn
2	12 V	Water mist, 3 GPM
3	12 V	Dry chemical
4	24 V	Free burn
5	24 V	Water mist, 3 GPM
6	24 V	Dry chemical
7	12 V	Water mist, 1 GPM
8	12 V	Water mist, 2 GPM
9	12 V	Water mist 3 GPM with F500 additive

battery fire suppression tests and noticed that a large amount of water is needed to extinguish BEV fires. Research on effective fire suppression technique for small and large battery pack fires in a mining environment is limited.

In this work, detailed experimental research was conducted to investigate the effectiveness of different fire suppression systems on Li-ion battery pack fires. Two sizes of Nickel/Manganese/Cobalt (NMC) Li-ion battery packs and five fire suppression systems were chosen. Results of the fire suppression tests will be discussed and compared.

2 Experiments

Experiments were conducted within an open-ended shipping container (12.2-m length by 2.4-m width by 2.9-m height) located at the Pittsburgh Mining Research Division. Two types of Li-ion battery packs were used for the tests: a 12 V, 30Ah battery pack composed of 36 NMC cylindrical 18,650 batteries and a 24 V, 40Ah battery pack composed of 72 NMC cylindrical 18,650 batteries. Two 750-W electric-controlled metal heater strips with dimensions of 45 cm × 3.8 cm × 0.8 cm (length × width × thickness) were placed under the battery packs to induce thermal runaway. K-type thermocouples were attached on the battery pack to measure the battery temperature (as shown in Fig. 1). Several fire suppression systems were used for the tests. Each used a flow controller and suppression spray placed 0.5 m above the battery pack. Video cameras were used to record the fire and suppression behaviors.

The battery tests included free burn and the use of fire suppression agents: water mist (1, 2, 3 gallon per minute (GPM) and 3 GPM with F500 additive), ABC powder, and type D sodium chloride (NaCl) dry chemical. During the tests, the battery pack was placed on the two electric heater strips to induce a thermal runaway and trigger a fire. Timing information for the first visible release of smoke and fire was noted. Electrical heating was turned off after the first jet of fire was observed; suppression, if used, was initiated at the same time. Table 1 summarizes the test conditions. Fire and smoke behaviors were observed and noted throughout the tests. A low-speed ventilation (~0.5 m/s) was applied to clear the smoke and gases.

3 Results and Discussion

With temperature measurements, comparisons were made between the free burn case and the suppression cases with distinctions drawn after suppression was applied to the battery pack fire.

3.1 Free Burn versus Water Suppression

Test 1 is the free burn case where no suppression was applied. In this case, smoke was observed to release at about 3.5 min after heating started, and the flame started at about 10 min. The explosion and fire continued for about 8 min before the battery pack burnout. During the test, it was observed that some of the batteries exploded and ejected from the pack, which is a potential ignition source for other combustibles nearby. Figure 2 shows the four sequences

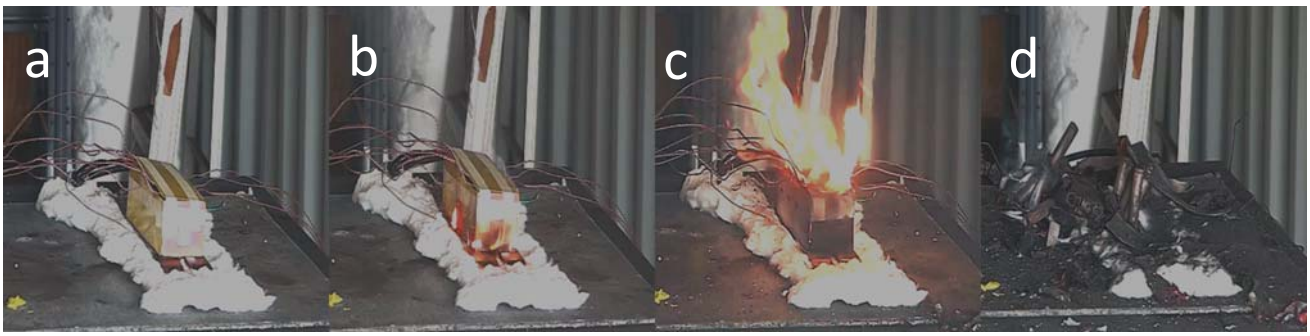


Fig. 2 Four sequences of free burn of a 12 V battery pack fire (**a** smoke starts, **b** flame starts, **c** explosion, **d** burnout)

Fig. 3 Three sequences of water mist suppression of a 12 V battery pack (**a** flame starts, **b** water suppression starts, **c** extinguishment)

of the free burn for the battery pack starting from smoke emission to battery burnout. As shown in the images, most of the batteries were completely burned out. However, it is worthwhile to note that some of the batteries were not burned even after the test was over due to the explosion and shootout behaviors. Some temperature measurements of the batteries were invalid due to the shootout behavior.

Test 2 is the water mist suppression with 3 GPM flow rate. In this case, smoke was observed to release at about 3 min after heating started, and the flame started at about 10 min. Heaters were unplugged at about 10.5 min. Water suppression started at about 13.5 min when the flame was fully established. Water suppression was turned off at about 16.5 min and the battery pack fire was completely extinguished. Re-examination of the battery pack after the test revealed that 8 batteries fully burned or exploded, but 28 of the batteries were partially burned or remained intact. There was no re-ignition after the battery fire was extinguished. Figure 3 shows the sequences of the water mist fire suppression

Temperatures were compared between the free burn of a 12V battery pack and a burn with water suppression. Figure 4 shows the temperature history of two temperature measurements. The two vertical dashed lines represent the water suppression period. It was observed from Figure 4 that battery temperatures of the free burn tests were much higher than the water mist suppression tests. In the free burn case, batteries went into thermal runaway and caught fire with sharp increases in battery temperatures. In the water suppression case, after water suppression was applied, the two thermocouple temperatures quickly dropped and remained below 200°C for the rest of the test. No re-ignition was observed. The cooling effect of water suppression was probably the key in containing the fire and preventing re-ignition.

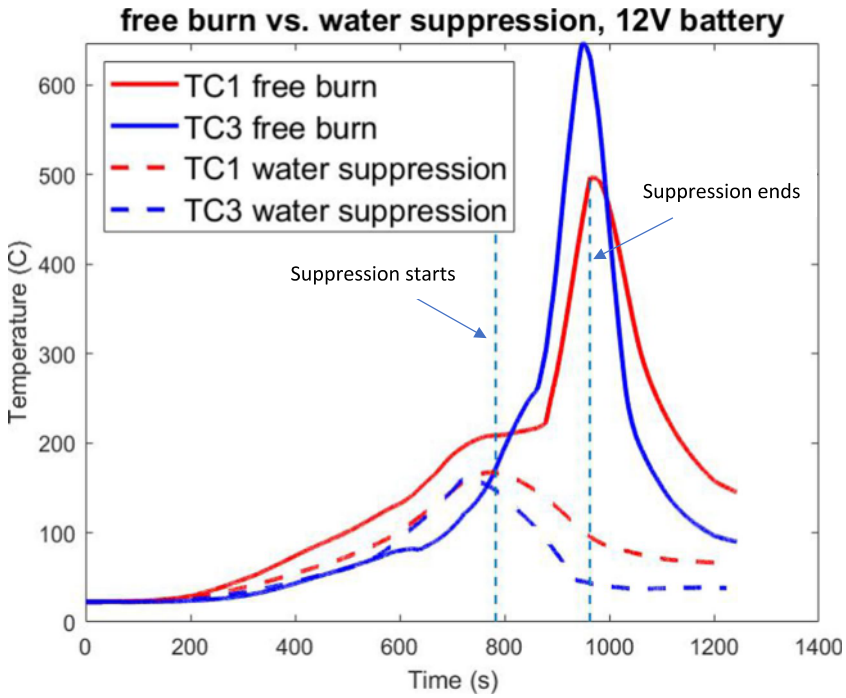


Fig. 4 Temperature comparison of free burn and water mist suppression

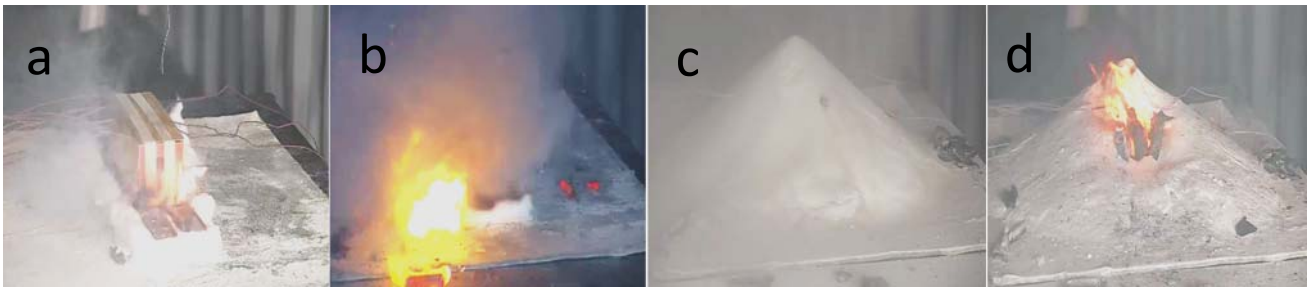


Fig. 5 The sequences of NaCl dry chemical suppression (**a** flame starts, **b** suppression starts, **c** battery fire quenched, **d** re-ignition and explosion)

3.2 Free Burn versus Dry Chemical Suppression

Test 3 is a fire suppression case with type D dry chemical. In this case, the battery fire started at about 10.5 min after heating. The suppressant was discharged at 12.5 min and lasted for about 45 s before the suppressant was depleted. The battery pack was buried under the dry chemical, and the fire visually disappeared as shown in Fig. 5 c. Shortly after the fire was quenched, re-ignition occurred, then the explosion followed. The battery fire continued until burnout. In this case, the dry chemical was able to quench the fire temporarily but failed to extinguish the fire completely.

The temperatures were compared between the free burn of a 12V battery pack and a burn with type D NaCl dry chemical suppression. Figure 6 shows the temperature history of two temperature measurements. The two vertical dashed lines represent the dry chemical suppression period. For the suppression case, it was observed that after suppression was applied, battery temperatures had a noticeable drop before they went up again due to re-ignition. In this case, the lack of cooling effect afforded by the dry chemical application probably played a major role in the re-ignition as the chemical reactions inside the battery continued despite external flame quenching and air exclusion.

3.3 Large Size Battery Pack

Test 4 is a free burn of a large battery pack (24V), test 5 is a water mist suppression case of the large battery pack (24V) fire with 3 GPM flow rate, and test 6 is the ABC dry chemical suppression case of the large battery pack (24V) fire. Figure 7 shows the comparison of free burn with water mist suppression and ABC dry chemical suppression regarding battery temperatures. The vertical dashed lines in both figures represent the suppression period. In the water mist suppression case (Fig. 7a), the application of water

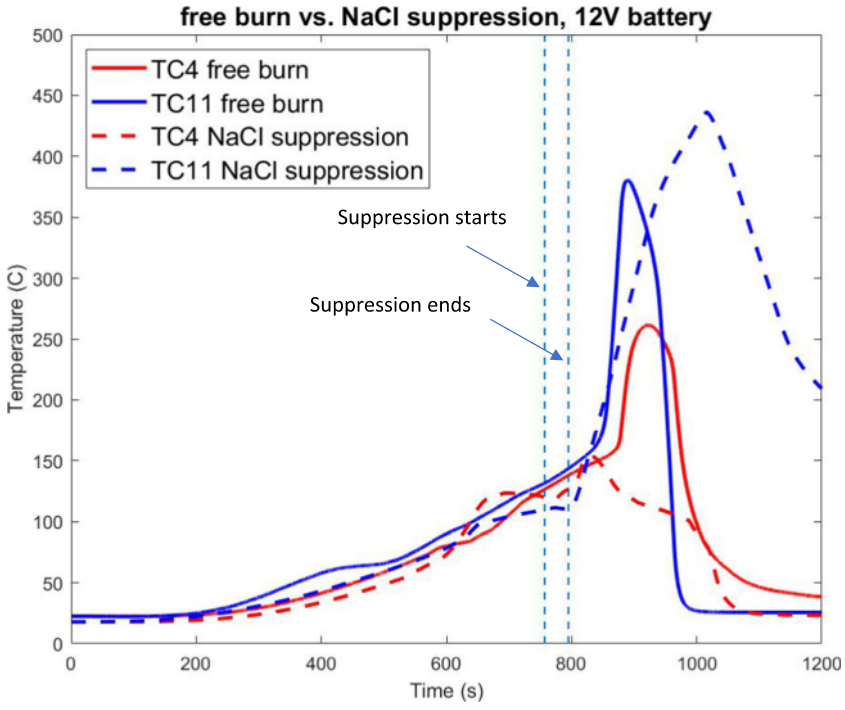


Fig. 6 Temperature comparison of free burn and dry chemical suppression

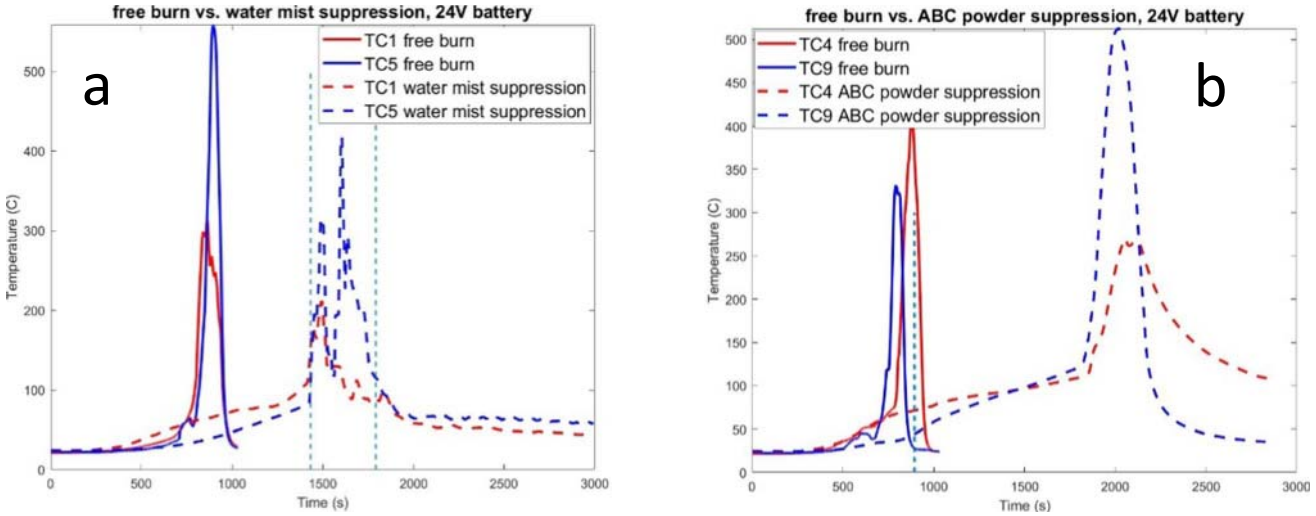


Fig. 7 Comparison of free burn of large size battery pack with suppressions: **a** 3 GPM water mist suppression, **b** ABC powder suppression

slowed the heating, but fire and explosion occurred during the suppression period. The 3 GPM water mist failed to suppress the fire of large size battery pack. In the ABC dry chemical suppression case (Fig. 7b), the initial application put out the flame temporarily, but battery temperatures still climbed slowly and eventually fire and explosion followed. The dry chemical also failed to contain and suppress the large battery pack fire.

3.4 The Effect of Water Mist Flow Rate

Different flow rates of water mist suppression were also used to study their impact on the small battery pack fire. Test 7 used water mist at 1 GPM, test 8 used water mist at 2 GPM, and test 9 used water mist at 3 GPM with F500 additive. In all three of these tests, water mist suppression started when the first explosion was observed. Four thermocouple data were plotted to demonstrate the battery temperature evolution against the time, shown in Figure 8. It was observed that

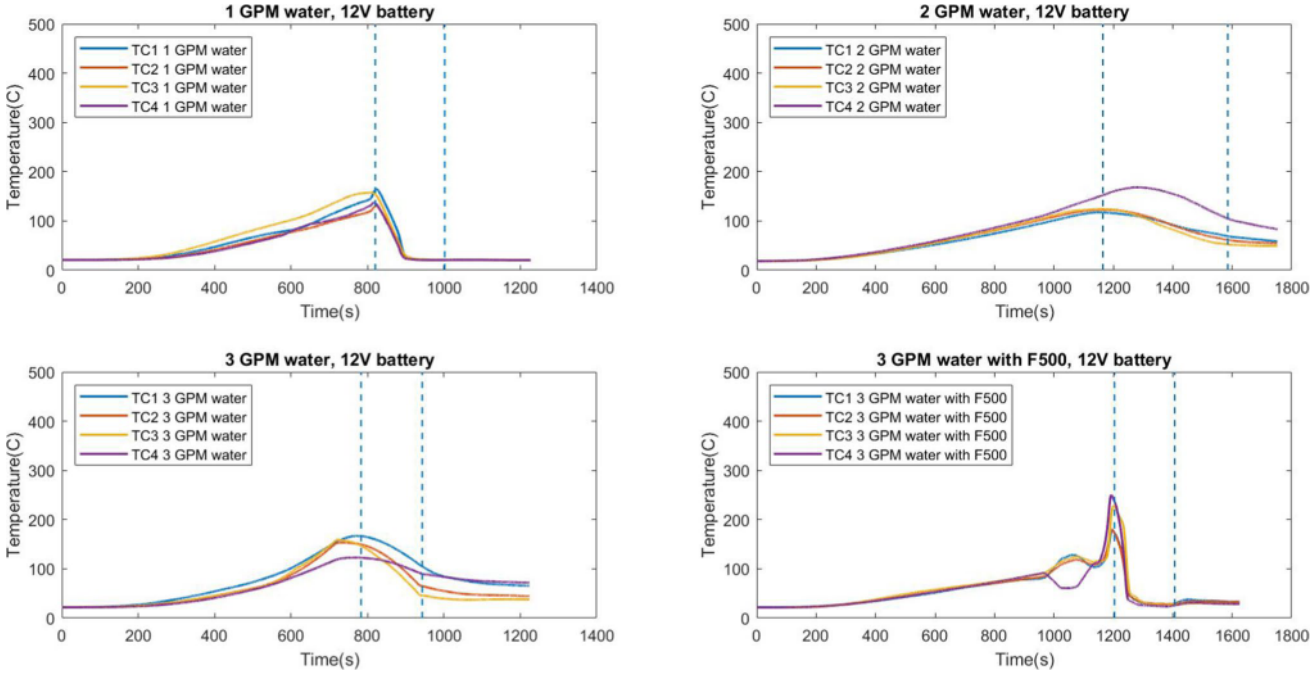


Fig. 8 The effect of water mist flow rate on suppression

water mist of all three flow rates can contain and suppress the small size battery fire without re-ignition. The 3 GPM flow rate with F500 additive might be the most effective since the drop in temperature was the quickest and most significant decrease.

4 Conclusions

Battery pack fire suppression tests were conducted at the NIOSH Pittsburgh Mining Research Division as part of its continual effort to develop workplace solutions to reduce the risk of mine disasters and mine workers' risk of injuries and fatalities. Water mist with different flow rates and/or additives, type D NaCl, and dry chemical ABC powder were used to study their effectiveness in Li-ion battery pack fire suppression. The results indicated that water mist can suppress a small battery pack fire, and its cooling effect prevents re-ignition from occurring. Water mist suppression with F500 as an additive can better suppress the fire. Type D NaCl and dry chemical ABC powder fire suppressants could quench the battery pack fire temporarily but failed to cool the battery, and re-ignition occurred. The results from this study can be used to develop an improved Li-ion battery pack fire suppression system for a mining environment.

Acknowledgements Data from this manuscript have been presented at the 2023 SME Annual Conference & Expo, February 26 – March 1, Denver, Colorado.

Declarations

Disclaimer The findings and conclusions in this paper are those of the authors and do not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention. Mention of any company or product does not constitute endorsement by NIOSH.

References

1. Dubaniewicz TH, Zlochower I, Barone T, Thomas R, Yuan L (2021) Thermal runaway pressures of iron phosphate lithium-ion cells as a function of free space. Metallurgy & Exploration 38:539–547. https://doi.org/10.1007/s42461-020-00349-9
2. Dubaniewicz TH, DuCarme JP (2013) Are lithium-ion cells intrinsically safe? IEEE Trans. Ind Appl 49:2451–2460
3. Dubaniewicz TH, DuCarme JP (2016) Internal short circuit and accelerated rate calorimetry tests of lithium-ion cells: Considerations for methane-air intrinsic safety and explosion proof/flameproof protection methods. J Loss Prev Process Ind 43:575–584
4. Wang Z, Ouyang D, Chen M, Wang X, Zhang Z, Wang J (2019) Fire behavior of lithium-ion battery with different states of charge induced by high incident heat fluxes, Journal of Thermal Analysis and Calorimetry 136 2239–2247
5. Chen M, Liu J, Dongxu O, Cao S, Wang Z, Wang J (2018) A simplified analysis to predict the fire hazard of primary lithium battery. Appl Sci 8:2329. https://doi.org/10.3390/app8112329
6. Fu Y, Lu S, Li K, Liu C, Cheng X, Zhang H (2015) An experimental study on burning behaviors of 18650 lithium ion batteries using a cone calorimeter. J Power Sources 273:216–222. https://doi.org/10.1016/j.jpowsour.2014.09.039
7. Wang Q, Li K, Wang Y, Chen H, Duan Q, Sun J (2018) The efficiency of dodecafluoro-2-methylpentan-3-one on suppressing the lithium ion battery fire. J Electrochem Energy Conversion Storage 15:041001
8. Wang Q, Mao B, Stoliarov SI, Sun J (2019) A review of lithium ion battery failure mechanisms and fire prevention strategies. Prog Energy Combust Sci 73:95–131
9. Luo WT, Zhu SB, Gong JH, Zhou Z (2018) Research and development of fire extinguishing technology for power lithium batteries. Procedia Eng 211:531–537
10. Liu Y, Duan Q, Xu J, Chen H, Lu W, Wang Q (2018) Experimental study on the efficiency of dodecafluoro-2-methylpentan-3-one on suppressing lithium-ion battery fires. RSC Adv 8:42223–42232
11. Li Y, Yu D, Zhang S (2015) A typical lithium-ion battery fire extinguishing test. Journal of safety and environment 15(6):120–125
12. Cui Y, Liu J (2021) Research progress of water mist fire extinguishing technology and its application in battery fires. Process Saf Environ Prot 149:559–574
13. Liu T, Liu Y, Wang X, Kong X, Li G (2019) Cooling control of thermally-induced thermal runaway in 18,650 lithium ion battery with water mist. Energy Convers Manag 199:111969
14. Larsson F, Andersson P, Blomqvist P, Loren A, Mellander B-E (2014) Characteristics of lithium-ion batteries during fire tests. J Power Sources 271:414–420
15. Blum A, Long R (2015) Full-abs," SAE Int. J Passeng Cars - Mech Syst 8(2):565–572. https://doi.org/10.4271/2015-01-1383

Public Input No. 193-NFPA 10-2023 [Section No. A.7.8.3.6]

A.7.8.3.6

Moisture within a non-water-type fire extinguisher creates a serious corrosion hazard to the fire extinguisher shell and also indicates that the extinguisher is probably inoperative. Moisture could possibly enter at under the following conditions:

(1) After a hydrostatic test

(2) When recharging is being performed

(3) When the valve has been removed from the cylinder

(4) Where compressed air and a moisture trap are used for pressurizing non-water types

It is extremely important to remove any water or moisture from any non-water-type fire extinguisher before recharging. Excess moisture in a dry chemical fire extinguisher causes the agent to cake and lump and become unusable. It also causes corrosion to the fire extinguisher shell and valve. In carbon dioxide and halogenated fire extinguishers, excess moisture combined with the extinguishing agent causes extremely corrosive acids to form. These acids can corrode the fire extinguisher shell and valve.

Statement of Problem and Substantiation for Public Input

This is only important for non-water extinguishers. Water type extinguishers need not be dried.

Submitter Information Verification

Submitter Full Name: Mark Conroy
Organization: Brooks Equipment Company
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 31 14:04:09 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-26-NFPA 10-2023
Statement: This revision corrects an omission. Water type extinguishers need not be dried. Only non-water extinguishers need to be dried.

Public Input No. 66-NFPA 10-2023 [Section No. A.7.13]

A.7.13

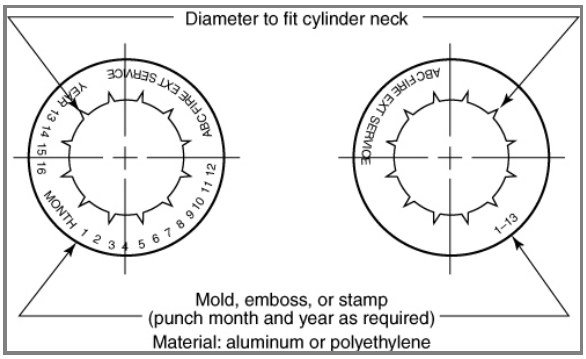
A verification-of-service collar is installed to show that an extinguisher has been depressurized, the valve has been removed, and a complete maintenance has been performed. The verification-of-service collar design also requires that the valve be removed before the collar can be attached to the extinguisher. The collar provides the authorities having jurisdiction with a convenient visual proof that the extinguisher has been disassembled and that maintenance most likely has been performed.

All extinguishers are to have the valve removed for hydrostatic testing and are to be subsequently recharged before they are returned to service. To be valid, the date on the verification-of-service collar should always be the same as or more recent than the date on the hydrostatic test label.

Figure A.7.13 provides a guide to the design of a verification-of-service collar.

Figure A.7.13 Design of a Verification-of-Service Collar.

Revise the sketch to show recent years. Change YEAR "13 14 15 16" to "YEAR 25 26 27 28". Also Change "1-13" to read "1-25".



Statement of Problem and Substantiation for Public Input

Sketch is dated. Update sketch to show the years that will reflect the new edition of the standard.

Submitter Information Verification

Submitter Full Name: Mark Conroy
Organization: Brooks Equipment Company
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 02 12:20:52 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-27-NFPA 10-2023
Statement: This revision updates the years in Figure A.7.13 to make the figure current.

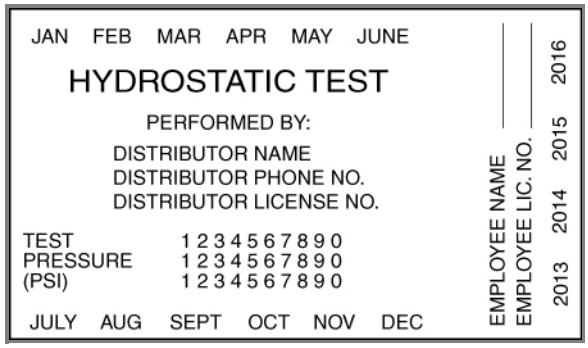
Public Input No. 67-NFPA 10-2023 [Section No. A.8.7.2]

A.8.7.2

Figure A.8.7.2 provides a guide to the design of a hydrostatic test label. All print should be black on a silver background.

Figure A.8.7.2 Design of a Hydrostatic Test Label.

Change "2013 2014 2015 2016" to read "2025 2026 2027 2028".



Statement of Problem and Substantiation for Public Input

Sketch is dated. Need to update years to reflect years for the new edition of the standard.

Submitter Information Verification

Submitter Full Name: Mark Conroy
Organization: Brooks Equipment Company
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 02 12:25:31 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-30-NFPA 10-2023
Statement: Years have been updated to reflect current years.

Public Input No. 156-NFPA 10-2023 [Section No. B.1]

B.1 General.

B.1.1

Markings should be applied by decals that are durable and resistant to color fading *(see Figure B.1.1)* . The color separation identification for the markings is as follows:

Reserved- Assuming Class L lithium Ion battery is accepted this sectioon will need to updated to include Class L labeling and markings which could be submitted during the 2nd report phase (comment cycle).

(1) Picture symbol objects are white.

(2) Background borders are white.

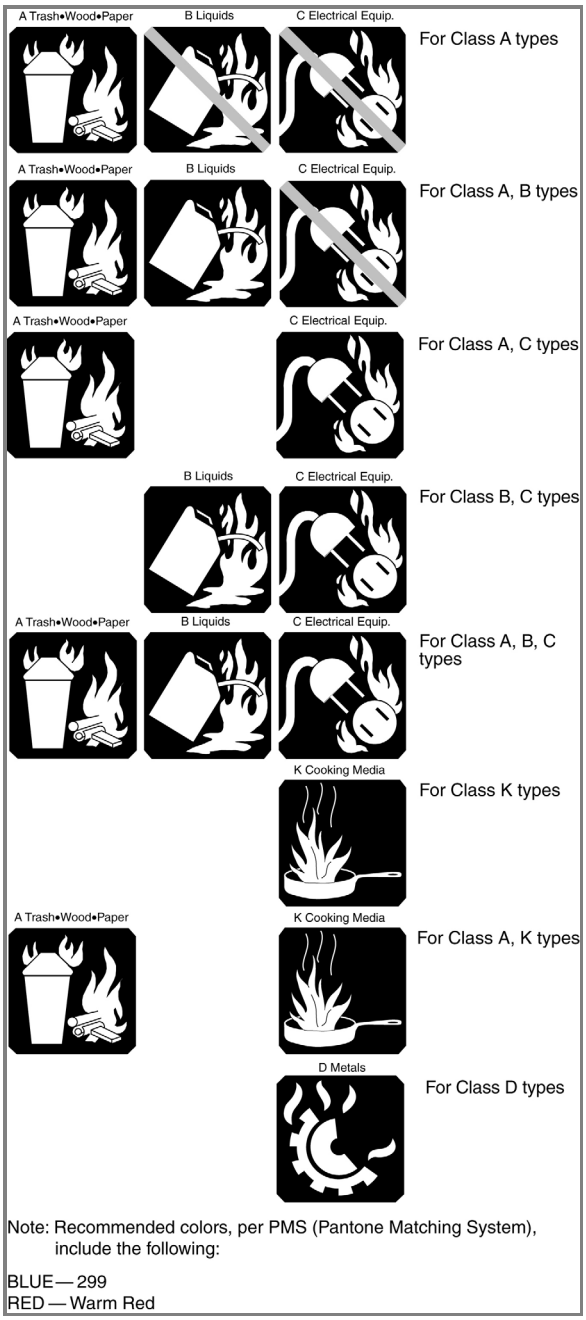
(3) Background for “YES” symbols is blue.

(4) Background for symbols with slash mark (“NO”) is black.

(5) Class of fire letters and wording is black.

(6) Slash mark for black background symbols is red.

Figure B.1.1 Recommended Marking System.



B.1.2

Markings should be located on the front of the fire extinguisher shell. Size and form should permit easy legibility at a distance of 3 ft (1 m). The labels shown in Figure B.1.1 are consistent with fire extinguishers that have been tested and listed in accordance with fire test standards. *(See 5.4.1.3.)*

B.1.3

Where markings are applied to wall panels, and so forth, in the vicinity of fire extinguishers, they should permit easy legibility at a distance of 15 ft (4.6 m).

Statement of Problem and Substantiation for Public Input

Added a reserve space for future creation of symbols for Class L fires.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 12:35:35 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 105-NFPA 10-2023 [Section No. B.1.1]

B.1.1

Markings should be applied by decals that are durable and resistant to color fading *(see Figure B.1.1)*. The color separation identification for the markings is as follows:

(1) Picture symbol objects are white.

(2) Background borders are white.

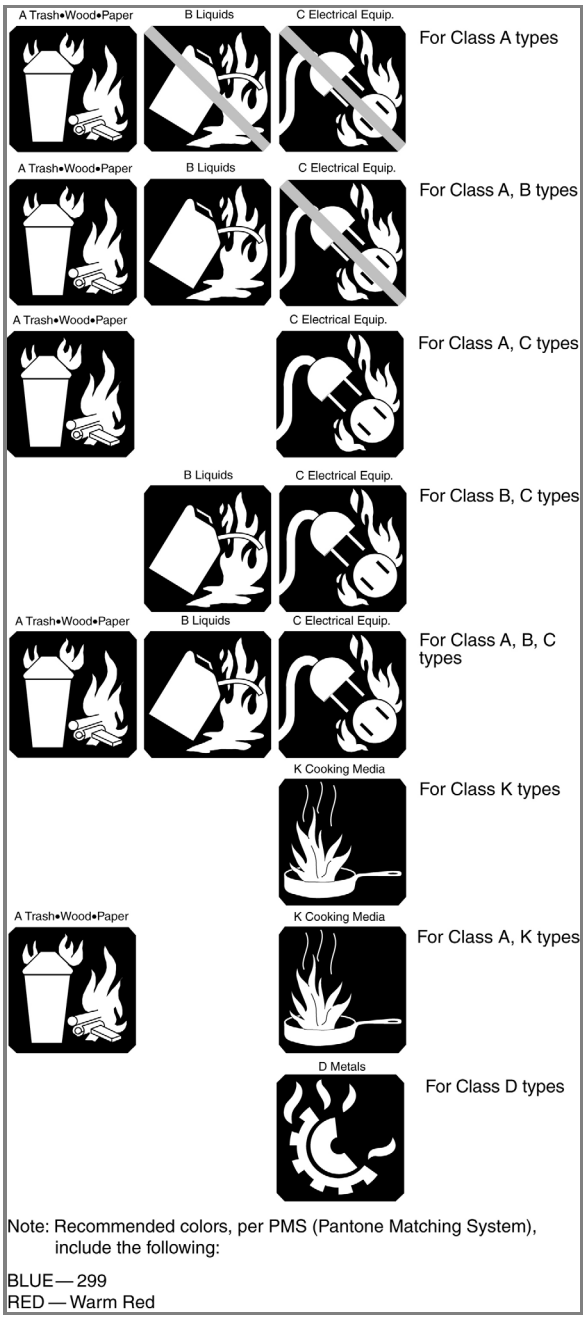
(3) Background for “YES” symbols is blue.

(4) ~~Background for symbols with slash mark (“NO”) is black.~~

(5) Class of fire letters and wording is black.

(6) ~~Slash mark for black background symbols is red.~~

Figure B.1.1 Recommended Marking System.



Additional Proposed Changes

File Name	Description	Approved

Figure_B.1.1_Image_-_Delete.pdf Figure B.1.1 Images to be deleted

Statement of Problem and Substantiation for Public Input

The recommendation of placing red slashes over non recommended use symbols is not only confusing and problematic from a fading, low light, and color-blind standpoint in the field, but also potentially conflicts with existing objectives and requirements identified within NFPA 10.

- 5.3.1 The classification of fire extinguishers shall consist of a letter that indicates the class of fire on which a fire extinguisher has been found to be effective.

- 5.3.2.1 Fire extinguishers for the protection of Class A hazards shall be selected from types that are specifically listed and labeled for use on Class A fires.

- 5.3.2.2 Fire extinguishers for the protection of Class B hazards shall be selected from types that are specifically listed and labeled for use on Class B fires.

- 5.3.2.3 Fire extinguishers for the protection of Class C hazards shall be selected from types that are specifically listed and labeled for use on Class C fires.

- 5.3.2.4 Fire extinguishers and agents for the protection of Class D hazards shall be selected from types that are specifically listed and labeled for use on Class D fires.

- 5.3.2.5 Fire extinguishers for the protection of Class K hazards shall be selected from types that are specifically listed and labeled for use on Class K fires.

Annex C
C.1 Principles of Selecting Fire Extinguishers.
C.1.3 Fire creates condition of stress and intense excitement. Under these conditions the choice of a correct fire extinguisher needs to be made quickly. The protection planner can help ensure selection of the correct fire extinguisher by using the following procedures:
(3) Marking clearly the intended use (See Annex B)

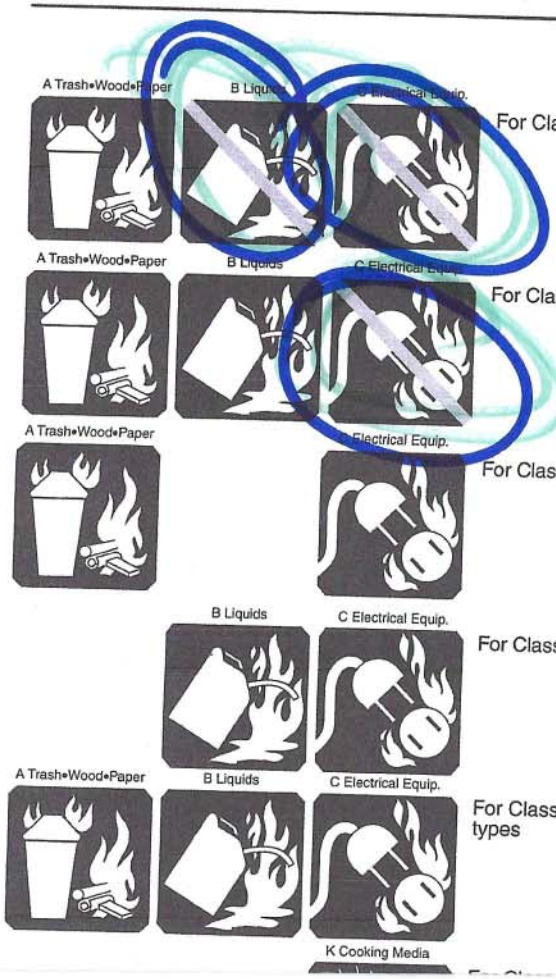
Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:39:50 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: The submitter does not provide technical substantiation to support removing the red slash. The blank spaces in Figure B.1.1 indicates that the extinguisher is not rated for the type of fire, while the slash means it is dangerous to use on that type fire.

DELETE THREE IMAGES



Ordinary

A

Combustibles

Extinguishers suitable for Class fires should be identified by a tr containing the letter "A." If colore triangle is colored green.*

Flammable

B

Liquids

Extinguishers suitable for Class fires should be identified by a sc containing the letter "B." If colore the square is colored red.*

Electrical

C

Equipment

Extinguishers suitable for Class (fires should be identified by a cir containing the letter "C." If colore the circle is colored blue.*

Combustible

D

Metals

Extinguishers suitable for fires involving metals should be identif by a five-pointed star containing t letter "D." If colored, the star is col yellow.*

* Recommended colors, per PMS (Pantone Matching System), include the following:

GREEN — Basic Green

RED — 193 Red

Public Input No. 189-NFPA 10-2023 [Section No. B.1.1]

B.1.1

Markings should be applied by decals that are durable and resistant to color fading *(see Figure B.1.1)*. The color separation identification for the markings is as follows:

(1) Picture symbol objects are white.

(2) Background borders are white.

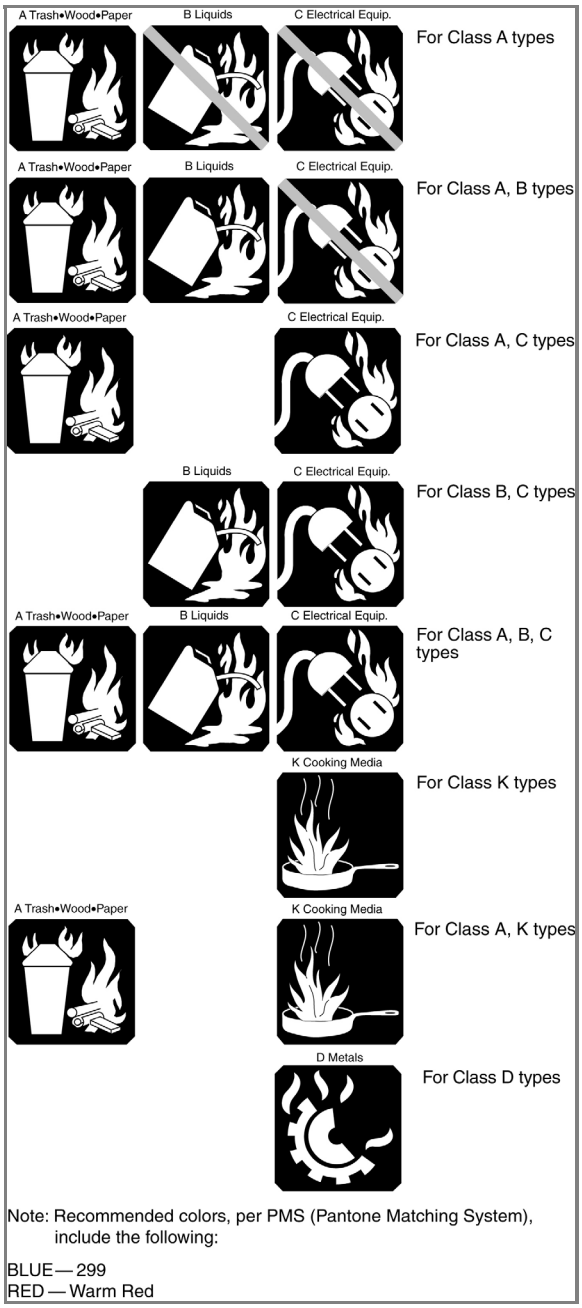
(3) Background for “YES” symbols is blue.

(4) Background for symbols with slash mark (“NO”) is black.

(5) Class of fire letters and wording is black.

(6) Slash mark for black background symbols is red.

Figure B.1.1 Recommended Marking System.



Additional Proposed Changes

File Name	Description	Approved

B.1.1_Public_Input_Flat_.pdf	New graphic for markings to indicate fire extinguisher suitability that includes the marking for extinguishers for use on Class L fires.

Statement of Problem and Substantiation for Public Input

With the addition of the Class L fire hazard, a new marking for extinguishers is required to indicate suitability for use on Class L hazards. The new graphic includes the new marking which is distinct from the markings for Class A, B, C, D, and K hazards.

Related Public Inputs for This Document

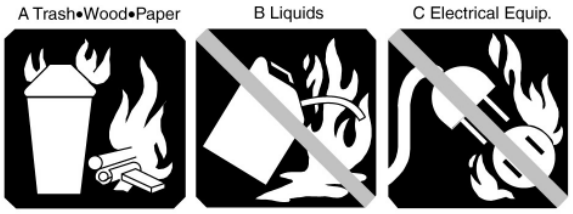
Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of the Class L fire hazard.

Submitter Information Verification

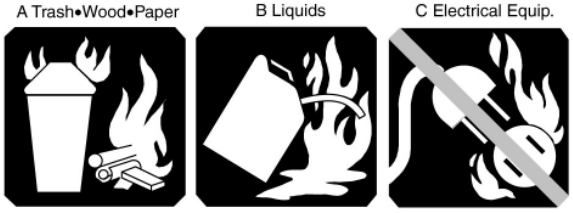
Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 30 16:46:15 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

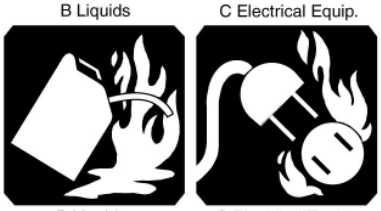


For Class A types



For Class A, B types

For Class A, C types



For Class B, C types

For Class A, B, C types

For Class K types

For Class A, K types

For Class D types

For Class L types

Note: Recommended colors, per PMS (Pantone Matching System), include the following:

BLUE — 299
RED — Warm Red

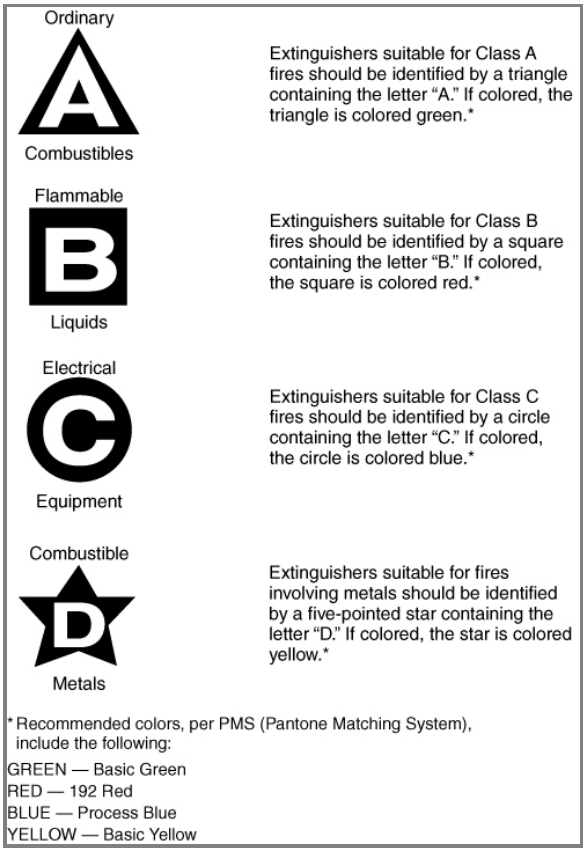
Public Input No. 157-NFPA 10-2023 [Section No. B.2.2]

B.2.2

Letter-shaped symbol markings, as previously recommended, are shown in Figure B.2.2. Note that fire extinguishers suitable for more than one class of fire were identified by multiple symbols placed in a horizontal sequence.

Reserved- Assuming Class L lithium Ion battery is accepted this section will need to updated to include Class L labeling and markings which could be submitted during the 2nd report phase (comment cycle).

Figure B.2.2 Letter-Shaped Symbol Markings.



Statement of Problem and Substantiation for Public Input

Added a reserve space for future symbols for Class L fires.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 12:39:36 EDT 2023
Committee: PFE-AAA

Committee Statement

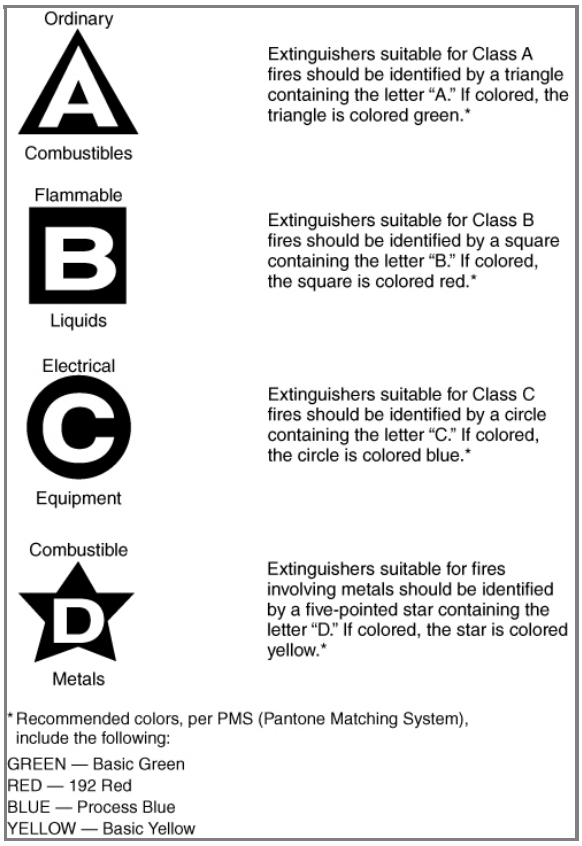
Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 187-NFPA 10-2023 [Section No. B.2.2]

B.2.2

Letter-shaped symbol markings, as previously recommended, are shown in Figure B.2.2. Note that fire extinguishers suitable for more than one class of fire were identified by multiple symbols placed in a horizontal sequence.

Figure B.2.2 Letter-Shaped Symbol Markings.



Additional Proposed Changes

File Name	Description	Approved
B.2.2_Public_Input_Flat_.pdf	New graphic for Section B.2.2 that includes the letter-shaped symbol marking for extinguishers for use on lithium batteries (Class L hazards).	

Statement of Problem and Substantiation for Public Input

Extinguishers for use on each currently defined class of fire hazard is marked by a letter shaped symbol. Therefore, such a symbol should be defined for extinguisers for use on Class L fire hazards. This new graphic adds the letter shaped symbol for Class L hazards to the graphic of Section B.2.2.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of the Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 30 15:58:30 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Ordinary

Combustibles

Extinguishers suitable for Class A fires should be identified by a triangle containing the letter “A.” If colored, the triangle is colored green.*

Flammable

Liquids

Extinguishers suitable for Class B fires should be identified by a square containing the letter “B.” If colored, the square is colored red.*

Electrical

Equipment

Extinguishers suitable for Class C fires should be identified by a circle containing the letter “C.” If colored, the circle is colored blue.*

Combustible

Metals

Extinguishers suitable for fires involving metals should be identified by a five-pointed star containing the letter “D.” If colored, the star is colored yellow.*

Lithium

Batteries

Extinguishers suitable for fires involving lithium batteries should be identified by a diamond containing the letter "L". If colored, the diamond is colored gray.*

* Recommended colors, per PMS (Pantone Matching System), include the following:

GREEN — Basic Green
RED — 192 Red
BLUE — Process Blue
YELLOW — Basic Yellow
GRAY — Cool Gray 5C

Public Input No. 95-NFPA 10-2023 [Section No. C.2.6.3]

C.2.6.3

Class B obstacle fire situations present some additional extinguisher agent, hardware, and application considerations. ~~AFFF and FFFP foam portable~~ Foam portable extinguishers are capable of extinguishing and securing horizontal flammable liquid situations by suppressing combustible vapors and are often the best choice for obstacle fire hazard situations when only one application point might be anticipated at the time of a fire. Nonsecuring or nonvapor suppressing types of Class B extinguishing agents can often only be successfully utilized when they are applied simultaneously from multiple locations to eliminate any blind spot presented by an obstacle. Special nonsecuring agent types of fire extinguishers that have higher agent discharge flow rates sufficient to effectively wrap around an obstacle can also successfully accomplish extinguishment. The system used to rate Class B fire extinguishers is not applicable to these types of fire hazard situations. The selection of extinguishers for these hazards should be made on the basis of the equipment manufacturer's recommendations.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:04:57 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-31-NFPA 10-2023
Statement: The term "foam" has been used to replace AFFF and FFFP to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world.

Public Input No. 158-NFPA 10-2023 [New Section after C.2.12]

C.13

Class L fires are fires involving Lithium Ion battery which are a unique electrochemical fire hazard that involves multiple classes (Class A, Class B, Class C ,Class D) within one entity. Class L listed fire extinguishers have effectively demonstrated the ability to address these of hazards.

Statement of Problem and Substantiation for Public Input

Added new information on Class L fires to be consistent with other classes of fire.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 13:02:26 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 159-NFPA 10-2023 [New Section after C.3.2.1]

Water additive fire extinguishers can be suitable for several classes of fire and can eliminate the need to have several different class of extinguishers at the same location.

Statement of Problem and Substantiation for Public Input

Added language for the use of water additives to be used on multiple classes of fires.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 13:07:53 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: A technical justification was not provided for the proposed change. Not all water additives are suitable for multiple hazards, the proposed text would add confusion for the user.

Public Input No. 96-NFPA 10-2023 [Section No. C.3.3]

C.3.3 ~~AFFF and FFFP Fire~~ Foam Fire Extinguishers.

~~AFFF (aqueous film-forming foam) and FFFP (film-forming fluoroprotein)~~ Foam fire extinguishers are rated for use on both Class A and Class B fires. They are not suitable for use in freezing temperatures. An advantage of this type of extinguisher when used on Class B flammable liquid fires of appreciable depth is the ability of the agent to float on and secure the liquid surface, which helps to prevent reignition.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:06:25 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-32-NFPA 10-2023
Statement: The term “foam” has been used to replace AFFF and FFFP to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world.

Public Input No. 160-NFPA 10-2023 [Section No. D.1.2.2]

D.1.2.2

Several different extinguishing materials are handled by each of these expelling means. Table D.1.2.2 lists the agent and expelling means combinations that are or have been in use.

Table D.1.2.2 Extinguisher Operation and Methods of Expelling

Extinguishing Materials	Expelling Methods					
	Self-Expelling	Gas Cartridge or Cylinder	Stored Pressure	Mechanically Pumped	Hand Propelled	
Water and antifreeze	-	-			x	x x
Wetting agent	-	-			x-	
Water Additive	-	AFFF and FFFP		- x	x x	- -
Loaded stream	-		x	x	-	-
Multipurpose dry chemical	-		x	x	-	-
Carbon dioxide	x	-	-	-	-	
Dry chemical	-		x	x	-	-
Halogenated agents	x	-		x	-	-
Dry powder (metal fires)	-		x	x	-	x
Wet chemical	-	-			x	- -

Statement of Problem and Substantiation for Public Input

Added water additive to the chart to be consistent with other Extinguisher Operation and Methods of Expelling in the chart.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 13:11:57 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-33-NFPA 10-2023
Statement: The term “foam” has been used to replace AFFF and FFFP to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world.

Water additive extinguisher type is not recognized in the standard.

Public Input No. 97-NFPA 10-2023 [Section No. D.1.2.2]

D.1.2.2

Several different extinguishing materials are handled by each of these expelling means. Table D.1.2.2 lists the agent and expelling means combinations that are or have been in use.

Table D.1.2.2 Extinguisher Operation and Methods of Expelling

Extinguishing Materials	Expelling Methods					
	Self-Expelling	Gas Cartridge or Cylinder	Stored Pressure	Mechanically Pumped	Hand Propelled	
Water and antifreeze	-	-			x	x x
Wetting agent	-	-			x	- - ~~AFFF and FFFP~~ -
Foam		x	x	-	-	
Loaded stream	-		x	x	-	-
Multipurpose dry chemical	-		x	x	-	-
Carbon dioxide	x	-	-	-	-	
Dry chemical	-		x	x	-	-
Halogenated agents	x	-		x	-	-
Dry powder (metal fires)	-		x	x	-	x
Wet chemical	-	-			x	- -

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:08:12 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-33-NFPA 10-2023

Statement: The term “foam” has been used to replace AFFF and FFFP to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world.

Water additive extinguisher type is not recognized in the standard.

Public Input No. 198-NFPA 10-2023 [New Section after D.2.4.2]

How Can Someone with Stroke Paralysis Operate A Fire Extinguisher in a Fire Emergency?

In reference to D.2.4.2 (1) Position for Operation, which states "...the position of operation is obvious (such as when one hand holds the fire extinguisher abd the other hand holds the nozzle), how can someone who has stroke paralysis with the use of only one hand successfully operate a portable fire extinguisher in a fire emergency in all of the occupancies as listed in NFPA 1? By definition, a fire extinguisher is a fire protection safety device, and NFPA states that a fire extinguisher is your first line of defense in a fire emergency. In its present configuration, a portable fire extinguisher does not comply with Operations 205; 309 & specifically 309.4, and of the ADA Standard. This must be amended. www.ashepardsprotection.com

Statement of Problem and Substantiation for Public Input

How can someone with stroke paralysis operate a portable fire extinguisher in a fire emergency?

Submitter Information Verification

Submitter Full Name: T Farris
Organization: A Shepard's Protection
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 01 01:18:03 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: There is no specific technical change being recommended by the submitter. NFPA 10 is not responsible for the design, manufacturing, and use of fire extinguishers. Also, see section 5.1.1.

Public Input No. 161-NFPA 10-2023 [New Section after D.4.1.5]

D.4.1.5.1 Encapsulator Agent (EA)Type.

Extinguishers of this type are usually available in hand portable models of 1½ gal (5.7 L) capacity and in wheeled models having liquid capacities of 45 gal and 60 gal (170 L and 228 L). These extinguishers have ratings of 2-A, 30-A, 40-A, and Class L respectively. The extinguishing agent used is a surface-active material added to water in proper quantities to materially reduce the surface tension of the water and thus increase penetrating and spreading characteristics as well s Encapsulate the fuels and vapors *(see NFPA 18 A).* Hand portable models are of the stored-pressure design and are operated essentially the same as other stored-pressure types. These extinguishers need to be protected from exposure to temperatures below 40°F (4°C).

Statement of Problem and Substantiation for Public Input

Added language for Encapsulator Agenet (EA) type, to be consistent with other agents in the Standard.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 13:14:53 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: This has not been adopted because portable fire extinguishers with encapsulator agents are not listed and labeled, which does not comply with NFPA 10. NFPA 10 requires extinguishers to be listed and labeled and meet or exceed all the requirements of ANSI/UL 711, CAN/ULC-S508, Standard for the Rating and Fire Testing of Fire Extinguishers, and one of the performance standards, such as, ANSI/UL 8, CAN/ULC -S554, Water Based Agent Fire Extinguishers (reference NFPA 10, Section 4.1.1).

Public Input No. 98-NFPA 10-2023 [Section No. D.4.2]

D.4.2 ~~Film-Forming~~ Foam Agents.

These fire extinguishers are intended for use on Class A and Class B fires. On flammable liquid fires of appreciable depth, best results are obtained when the discharge from the fire extinguisher is played against the inside of the back wall of the vat or tank just above the burning surface to permit the natural spread of the agent back over the burning liquid. If this cannot be done, the operator should stand far enough away from the fire to allow the agent to fall lightly on the burning surface — the stream should not be directed into the burning liquid. Where possible, the operator should walk around the fire while directing the stream to get maximum coverage during the discharge period. For fires in ordinary combustible materials, the agent can be used to coat the burning surface directly. For flammable liquid spill fires, the agent could be flowed over a burning surface by bouncing it off the floor just in front of the burning area. Film-forming foam agents are not effective on flammable liquids and gases escaping under pressure or on cooking grease fires.

D.4.2.1 ~~AFFF and FFFP~~ Foam .

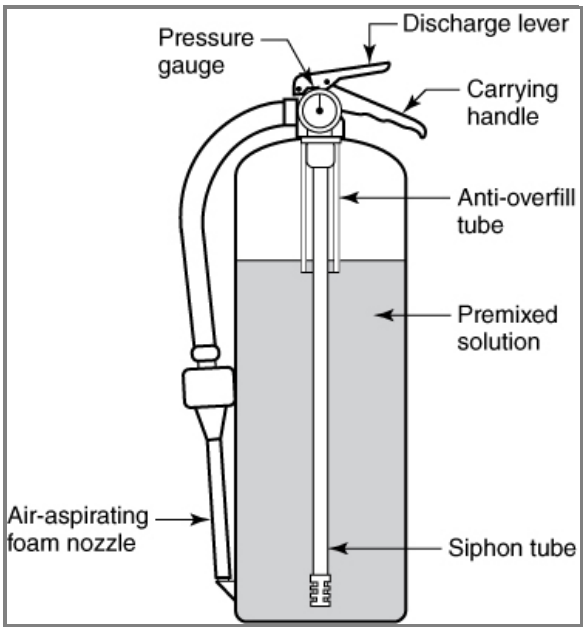
Fire extinguishers of these types are usually available in hand portable models of 1.6 gal (6 L) and $2^{1}\!/\!_{~~2~~}$ ~~gal~~ .5 gal (9.46 L) and in wheeled models having a liquid capacity of 33 gal (125 L). These fire extinguishers have ratings of 2-A:10-B, 3-A:20-B, and 20-A:160-B, respectively. The extinguishing agent is a solution of film-forming surfactant in water that forms mechanical foam when discharged through an aspirating nozzle. On Class A fires, the agent acts as both a coolant and a penetrant to reduce temperatures to below the ignition level. On Class B fires, the agent acts as a barrier to exclude air or oxygen from the fuel surface.

Grades of these agents are also suitable for the protection of water-soluble flammable liquids (polar solvents) such as alcohols, acetone, esters, ketones, and so forth. The suitability of these fire extinguishers for polar solvent fires should be referenced specifically on the nameplate. These agents are not suitable for use on pressurized fuel fires or cooking grease fires.

Specific information on the properties and limitations of ~~AFFF and FFFP are~~ foam are contained in NFPA 11.

The hand portable models closely resemble stored-pressure water fire extinguishers except for the special types of nozzles *(see Figure D.4.2.1)*. Wheeled types are operated by a separate nitrogen cylinder containing the expellant gas, which, when released, pressurizes the agent container. The discharge is controlled by a special aspirating shutoff type of nozzle at the end of the hose assembly. These types of fire extinguishers can be used only in locations not subject to freezing conditions, unless special measures recommended by the manufacturer are provided to prevent the agent from freezing.

Figure D.4.2.1 Stored-Pressure ~~AFFF or FFFP Liquid~~ Foam Liquid Extinguisher.



Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:09:57 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-34-NFPA 10-2023
Statement: The term “foam” has been used to replace AFFF and FFFP to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world.

Public Input No. 180-NFPA 10-2023 [New Section after E.7]

E.8 Class L Fire Extinguisher Distribution

Statement of Problem and Substantiation for Public Input

Each fire hazard class is provided with clarification of fire extinguisher distribution in NFPA 10 Annex E. This section provides this clarification for extinguishers for use on Class L hazards. This input defines the new section heading.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of the Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 18:27:41 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 181-NFPA 10-2023 [New Section after E.7]

E.8.1

For Class L hazards, the availability of special portable fire extinguishers (or equivalent equipment to contain or extinguish any fires developing from energized lithium batteries) is particularly important. Extinguishing equipment for such fires should be located no more than 75 ft (22.9 m) from the hazard.

Statement of Problem and Substantiation for Public Input

This section provides clarification on travel distance requirements for extinguishers for use on Class L fires. Due to the fast fire growth rates, difficulty of suppression once a fire is fully involved, and explosion risk associated with lithium batteries, the suppression of Class L fires during the incipient stage is particularly important. The recommended maximum travel distance from a Class L hazard to an extinguisher is 75 feet based on the requirements for Class D fires. This is also the maximum travel distance allowed for any fire extinguisher.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of the Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 18:29:18 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 195-NFPA 10-2023 [New Section after E.7]

E 8.

Reserved space for future determination of where to install Class extinguishers since this type of fire is a combination of other class of fire.

Statement of Problem and Substantiation for Public Input

Reserved space for future determination of where to install Class extinguishers since this type of fire is a combination of other class of fire.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 31 17:11:47 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 162-NFPA 10-2023 [Section No. F.4.1]

F.4.1

The following types of fire extinguishers are recommended for installation and use in family dwellings and living units:

(1) Dry chemical

(2) Water, AFFF, FFFP, antifreeze, wetting agent, EA.

(3) Carbon dioxide

(4) General use residential fire extinguisher

(5) Special purpose residential fire extinguisher

Statement of Problem and Substantiation for Public Input

Added language for acceptance of (EA) extinguishers to be used in this application.

Submitter Information Verification

Submitter Full Name: Craig Leadbetter
Organization: Hazard Control Technologies
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 26 07:47:40 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: This has not been adopted because portable fire extinguishers with encapsulator agents are not listed and labeled, which does not comply with NFPA 10. NFPA 10 requires extinguishers to be listed and labeled and meet or exceed all the requirements of ANSI/UL 711, CAN/ULC-S508, Standard for the Rating and Fire Testing of Fire Extinguishers, and one of the performance standards, such as, ANSI/UL 8, CAN/ULC -S554, Water Based Agent Fire Extinguishers (reference NFPA 10, Section 4.1.1).

Public Input No. 99-NFPA 10-2023 [Section No. F.4.1]

F.4.1

The following types of fire extinguishers are recommended for installation and use in family dwellings and living units:

(1) Dry chemical

(2) Water, ~~AFFF~~ foam , ~~FFFP,~~ antifreeze, wetting agent

(3) Carbon dioxide

(4) General use residential fire extinguisher

(5) Special purpose residential fire extinguisher

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:14:54 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-35-NFPA 10-2023

Statement: The term “foam” has been used to replace AFFF and FFFP to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world.

Loaded stream is the industry term for extinguishers using a freezing point depressant (antifreeze) agent.

Public Input No. 100-NFPA 10-2023 [Section No. F.4.2]

F.4.2

The following types of extinguishers are considered obsolete and should be removed from service and replaced:

(1) Soda acid types

(2) Chemical foam ~~(excluding film-forming agents)~~

(3) Carbon tetrachloride, methyl bromide, and chlorobromomethane (CBM)

(4) Cartridge-operated water

(5) Cartridge-operated loaded stream

(6) Copper or brass shell fire extinguishers (excluding pump tanks) joined by soft solder or rivets

(7) Extinguishers rated prior to 1955 and marked B-1, C-1 on the nameplate

(8) Fire extinguishers not listed or labeled

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:16:06 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-36-NFPA 10-2023
Statement: This revision clarifies that the only chemical foam that is to be removed from service are those chemical foams that contain sodium bicarbonate with aluminium sulphate. This aligns with committee action on section 4.4.

Public Input No. 101-NFPA 10-2023 [Section No. F.7.3.2]

F.7.3.2

Manufacturer's instructions specify servicing of rechargeable fire extinguishers after any use. The frequency of internal maintenance and hydrostatic testing is specified in the owner's manual and in Table F.7.3.2.

Table F.7.3.2 Frequency of Internal Maintenance and Hydrostatic Testing of Fire Extinguishers

Type of Extinguisher	Internal Maintenance Interval (years)	Hydrostatic Testing Interval (years)
Dry chemical*	6	12
Water, ~~AFFF~~ foam , ~~FFFP,~~ antifreeze	5	5
Halogenated agent†	6	12
Carbon dioxide	5	5

*Nonrechargeable dry chemical extinguishers do not require a 6-year internal inspection but should be removed from service 12 years after the date of manufacture.

†Nonrechargeable halogenated agent extinguishers do not require an internal inspection but should be removed from service 12 years from the date of manufacture. The extinguishers should be returned to the manufacturer or the manufacturer's designated agent for reclaiming of the halogenated agent.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:17:25 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-37-NFPA 10-2023
Statement: The term "foam" has been used to replace AFFF and FFFP to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world.

Loaded stream is the industry term for extinguishers using a freezing point depressant (antifreeze) agent.

Public Input No. 186-NFPA 10-2023 [Section No. G.1.1]

G.1.1

The classification and rating system described in this standard is that of Underwriters Laboratories Inc. and Underwriters Laboratories of Canada and is based on the extinguishment of planned fires of determined size and description as follows:

(1) *Class A Rating.* Wood

(2) *Class B Rating.* Two in. (51 mm) depth heptane fires in square pans

(3) *Class C Rating.* No fire test; special tests required to ensure the safety of the extinguisher operator

(4) *Class D Rating.* Special tests on specific combustible metal fires

(5) *Class K Rating.* Special tests on cooking appliances using combustible cooking media (vegetable or animal oils and fats)

(6) *Class L Rating.* Special tests on lithium batteries (to be determined) [Reserve]

Statement of Problem and Substantiation for Public Input

With the addition of Class L fire hazards, the determined size and description of the planned fires included in the standard tests developed by UL and ULC should be included for the new fire hazard. Standards to test the extinguishing capabilities of agents when used on Class L hazards have not yet been developed. Therefore, this amendment should be reserved until such a standard has been developed.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 172-NFPA 10-2023 [New Section after 5.2.5]	Dependant on the addition of the Class L fire hazard.

Submitter Information Verification

Submitter Full Name: Jacob David
Organization: Wiss, Janney, Elstner Associates, Inc. (WJE)
Affiliation: Jesse Corletto, EfireX
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 30 15:27:53 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: Fires from lithium-ion batteries are challenging fires to suppress and extinguish. These fires, regardless of the lithium-ion battery cell chemistry, are typically unpredictable, fast growth, high energy density, electro-chemical fires; which might involve Class A materials, Class B gases, Class C energized electrical equipment (such as, when plugged into an AC charging source), or a Class D hazard as a function of the intended containment structure (e.g., aluminum alloy material used for the containment structure). In addition to the fire hazard, there are several additional potential safety hazards, including venting of hot gases, explosion of the combustion gas byproducts (e.g., hydrogen gas), toxicity of the combustion gas byproducts (e.g., acidic hydrofluoric gas), presence of physical obstruction(s) that hinder the agent from reaching the seat of the fire source, cascading thermal runaway propagation from cell to cell, projectile expulsion of hot and/or burning cell(s) from the fire source and/or exposure to leaking electrolyte. The Fire Protection Research Foundation (FPRF) report “Lithium-Ion Batteries Hazard and Use Assessment”, Chapter 6, Lithium-Ion Fire Hazard Assessment, section on

Effectiveness of Suppressants was reviewed. The fact that a lithium-ion battery fire might contain a combination of A, B, C, D hazards is not sufficient to create its own class of fire. As noted, the combination of hazards, including explosion risk, off-gassing, and moves this problem beyond the scope of incipient fire meant to be addressed by NFPA 10. Class L has not been incorporated for these reasons.

Public Input No. 102-NFPA 10-2023 [Section No. H.2]

H.2 Health and Safety Conditions That Affect Selection.

When a fire extinguisher is being selected, consideration should be given to the health and safety hazards involved in its maintenance and use, as described in the following items:

(1) For confined spaces, prominent caution labels on the fire extinguisher, warning signs at entry points, provision for remote application, extra-long-range fire extinguisher nozzles, special ventilation, provision of breathing apparatus and other personal protective equipment, and adequate training of personnel are among the measures that should be considered.

(2) Although halogenated agent–type fire extinguishers contain agents whose vapor has a low toxicity, their decomposition products can be hazardous. When using these fire extinguishers in unventilated places, such as small rooms, closets, motor vehicles, or other confined spaces, operators and others should avoid breathing the gases produced by thermal decomposition of the agent.

(3) Carbon dioxide fire extinguishers contain an extinguishing agent that will not support life when used in sufficient concentration to extinguish a fire. The use of this type of fire extinguisher in an unventilated space can dilute the oxygen supply. Prolonged occupancy of such spaces can result in loss of consciousness due to oxygen deficiency.

(4) Fire extinguishers not rated for Class C hazards (e.g., water, antifreeze, loaded stream, ~~AFFF~~ foam , ~~FFFP,~~ wetting agent, and foam) present a shock hazard if used on fires involving energized electrical equipment.

(5) When used in a small unventilated area, dry chemical fire extinguishers can reduce visibility for a period of up to several minutes. Dry chemical discharged in an area can also clog filters in air-cleaning systems.

(6) A dry chemical fire extinguisher containing ammonium compounds should not be used on oxidizers that contain chlorine. The reaction between the oxidizer and the ammonium salts can produce the explosive compound nitrogen trichloride (NCl_3).

(7) Halogenated extinguishers should not be used on fires involving oxidizers, since they can react with the oxidizer.

(8) Most fires produce toxic decomposition products of combustion, and some materials, upon burning, can produce highly toxic gases. Fires can also consume available oxygen or produce dangerously high exposure to convected or radiated heat. All of these can affect the degree to which a fire can be safely approached with fire extinguishers.

Table H.2 summarizes the characteristics of fire extinguishers and can be used as an aid in selecting fire extinguishers in accordance with Chapter 5. The ratings given are those that were in effect at the time this standard was prepared. Current listings should be consulted for up-to-date ratings.

Table H.2 Characteristics of Extinguishers

Extinguishing Agent	Method of Operation	Capacity	Horizontal Range of Stream	Approximate Time of Discharge	Protection Required Below 40°F (4°C)	UL or ULC Classifications[a]
Water	Stored-pressure	1⅜ gal (6 L)	30–40 ft (9.1–12.2 m)	40 sec	Yes	1-A
	-	Stored-pressure or pump	2½ gal (9.5 L)	30–40 ft (9.1–12.2 m)	1 min	Yes 2-A
	-	Pump	4 gal (15.1 L)	30–40 ft (9.1–12.2 m)	2 min	Yes 3-A
	-	Pump	5 gal (19.0 L)	30–40 ft (9.1–12.2 m)	2–3 min	Yes 4-A
Water (wetting agent)	Stored-pressure	1½ gal (5.7 L)	20 ft (6.1 m)	30 sec	Yes	2-A
	-	Stored-pressure	25 gal (95 L) (wheeled)	35 ft (10.7 m)	1½ min	Yes 10-A
	-	Stored-pressure	45 gal (170 L) (wheeled)	35 ft (10.7 m)	2 min	Yes 30-A
	-	Stored-pressure	60 gal (227 L) (wheeled)	35 ft (10.7 m)	2½ min	Yes 40-A

Extinguishing Agent	Method of Operation	Capacity	Horizontal Range of Stream	Approximate Time of Discharge	Protection Required Below 40°F (4°C)	UL or ULC Classifications[a]	
Loaded stream	Stored-pressure	2½ gal (9.5 L)	30–40 ft (9.1–12.2 m)	1 min	No	2-A	
	-	Stored-pressure	33 gal (125 L) (wheeled)	50 ft (15.2 m)	3 min	No	20-A
Water mist	Stored-pressure	1.8–2.5 gal (6.8–9.5 L)	5–12 ft (1.5–3.7 m)	50–80 sec	Yes	2-A:C	
~~AFFF,~~ ~~FFFP~~ Foam	Stored-pressure	2~~1~~/~~2~~ - .5 gal (9.5 L)	20–25 ft (6.1–7.6 m)	50 sec	Yes	3-A:20 to 40-B	
	-	Stored-pressure	1~~3~~/~~5~~ - .6 gal (6 L)	20–25 ft (6.1–7.6 m)	50 sec	Yes	2-A: 10-B
	-	Nitrogen cylinder	33 gal (125 L)	30 ft (9.1 m)	1 min	Yes	20-A: 160-B
Carbon dioxide[b]	Self-expelling	2½–5 lb (9.5 L)	3–8 ft (0.9–2.4 m)	8–30 sec	No	1 to 5-B:C	
	-	Self-expelling	10–15 lb (4.5–6.8 kg)	3–8 ft (0.9–2.4 m)	8–30 sec	No	2 to 10-B:C
	-	Self-expelling	20 lb (9 kg)	3–8 ft (0.9–2.4 m)	10–30 sec	No	10-B:C
	-	Self-expelling	50–100 lb (23–45 kg) (wheeled)	3–10 ft (0.9–3 m)	10–30 sec	No	10 to 20-B:C
Regular dry chemical (sodium bicarbonate)	Stored-pressure	1–2½ lb (0.45–1.1 kg)	5–8 ft (1.5–2.4 m)	8–12 sec	No	2 to 10-B:C	
	-	Cartridge or stored-pressure	2¾–5 lb (1.2–2.3 kg)	5–20 ft (1.5–6.1 m)	8–25 sec	No	5 to 20-B:C
	-	Cartridge or stored-pressure	6–30 lb (2.7–13 kg)	5–20 ft (1.5–6.1 m)	10–25 sec	No	10 to 160-B:C
	-	Stored-pressure	50 lb (23 kg) (wheeled)	20 ft (6.1 m)	35 sec	No	160-B:C
	-	Nitrogen cylinder or stored-pressure	75–350 lb (34–159 kg) (wheeled)	15–45 ft (4.6–13.7 m)	20–105 sec	No	40 to 320-B:C
Purple K dry chemical (potassium bicarbonate)	Cartridge or stored-pressure	2–5 lb (0.9–2.3 kg)	5–12 ft (1.5–3.7 m)	8–10 sec	No	5 to 30-B:C	
	-	Cartridge or stored-pressure	5½–10 lb (2.5–4.5 kg)	5–20 ft (1.5–6.1 m)	8–20 sec	No	10 to 80-B:C
	-	Cartridge or stored-pressure	16–30 lb (7.3–14 kg)	10–20 ft (3–6.1 m)	8–25 sec	No	40 to 120-B:C

Extinguishing Agent	Method of Operation	Capacity	Horizontal Range of Stream	Approximate Time of Discharge	Protection Required Below 40°F (4°C)	UL or ULC Classifications[a]	
	-	Cartridge or stored-pressure	48–50 lb (22–23 kg) (wheeled)	20 ft (6.1 m)	30–35 sec	No	120 to 160-B:C
	-	Nitrogen cylinder or stored-pressure	125–315 lb (57–143 kg) (wheeled)	15–45 ft (4.6–14 m)	30–80 sec	No	80 to 640-B:C
Multipurpose/ABC dry chemical (ammonium phosphate)	Stored-pressure	1–5 lb (0.5–2.3 kg)	5–12 ft (1.5–3.7 m)	8–10 sec	No	1 to 3-A[c] and 2 to 10-B:C	
	-	Stored-pressure or cartridge	2½–9 lb (1.1–4.1 kg)	5–12 ft (1.5–3.7 m)	8–15 sec	No	1 to 4-A and 10 to 40-B:C
	-	Stored-pressure or cartridge	9–17 lb (4.1–7.7 kg)	5–20 ft (1.5–6.1 m)	10–25 sec	No	2 to 20-A and 10 to 80-B:C
	-	Stored-pressure or cartridge	17–30 lb (7.7–14 kg)	5–20 ft (1.5–6.1 m)	10–25 sec	No	3 to 20-A and 30 to 120-B:C
	-	Stored-pressure or cartridge	45–50 lb (20–22.7 kg) (wheeled)	20 ft (6.1 m)	25–35 sec	No	20 to 30-A and 80 to 160-B:C
	-	Nitrogen cylinder or stored-pressure	125–350 lb (57–159 kg) (wheeled)	15–45 ft (4.6–14 m)	30–60 sec	No	20 to 40-A and 60 to 320-B:C
Dry chemical (foam compatible)	Cartridge or stored-pressure	4¾–9 lb (2.1–4.1 kg)	5–20 ft (4.6–14 m)	8–10 sec	No	10 to 20-B:C	
	-	Cartridge or stored-pressure	9–27 lb (4.1–12 kg)	5–20 ft (4.6–14 m)	10–25 sec	No	20 to 30-B:C
	-	Cartridge or stored-pressure	18–30 lb (8.2–14 kg)	5–20 ft (4.6–14 m)	10–25 sec	No	40 to 60-B:C
	-	Nitrogen cylinder or stored-pressure	150–350 lb (68–159 kg) (wheeled)	15–45 ft (4.6–14 m)	20–150 sec	No	80 to 240-B:C
Wet chemical	Stored-pressure	⅘ gal (3 L)	8–12 ft (2.4–3.7 m)	30 sec	No	K	

Extinguishing Agent	Method of Operation	Capacity	Horizontal Range of Stream	Approximate Time of Discharge	Protection Required Below 40°F (4°C)	UL or ULC Classifications[a]	
	-	Stored-pressure	1⅜ gal (6 L)	8–12 ft (2.4–3.7 m)	35–45 sec	No	K
	-	Stored-pressure	2½ gal (9.5 L)	8–12 ft (2.4–3.7 m)	75–85 sec	No	K
Halon 1211 (bromochloro-difluoromethane)	Stored-pressure	0.9–2 lb (0.4–0.9 kg)	6–10 ft (1.8–3 m)	8–10 sec	No	1 to 2-B:C	
	Stored-pressure	2–3 lb (0.9–1.4 kg)	6–10 ft (1.8–3 m)	8–10 sec	No	5-B:C	
	-	Stored-pressure	5½–9 lb (2.5–4.1 kg)	9–15 ft (2.7–4.6 m)	8–15 sec	No	1-A:10-B:C
	-	Stored-pressure	13–22 lb (6–10 kg)	14–16 ft (4.3–4.9 m)	10–18 sec	No	2 to 4-A and 20 to 80-B:C
	-	Stored-pressure	50 lb (23 kg)	35 ft (11 m)	30 sec	No	10-A:120-B:C
	-	Stored-pressure	150 lb (68 kg) (wheeled)	20–35 ft (6.1–11 m)	30–44 sec	No	30-A:160 to 240-B:C
Halon 1211/1301 (bromochloro-difluoromethane bromotrifluoro-methane) mixtures	Stored-pressure or self-expelling	0.9–5 lb (0.41–2.3 kg)	3–12 ft (0.9–3.7 m)	8–10 sec	No	1 to 10-B:C	
	Stored-pressure	9–20 lb (4.1–9 kg)	10–18 ft (3.0–5.5 m)	10–22 sec	No	1-A:10-B:C to 4-A:80-B:C	
Halocarbon type	Stored-pressure	1.4–150 lb (0.6–68 kg)	6–35 ft (1.8–10.7 m)	9–38 sec	No	1-B:C to 10-A:120-B:C	

Note: Halon should be used only where its unique properties are deemed necessary.

[a]Readers concerned with specific ratings should review the pertinent lists issued by these laboratories: Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096, or Underwriters' Laboratories of Canada, 7 Underwriters Road, Toronto, ON, M1R 3B4, Canada.

[b]Carbon dioxide extinguishers with metal horns do not carry a C classification.

[c]Some small extinguishers containing ammonium phosphate–based dry chemical do not carry an A classification.

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:19:05 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-38-NFPA 10-2023
Statement: The term “foam” has been used to replace AFFF and FFFP to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world.

Loaded stream is the industry term for extinguishers using a freezing point depressant (antifreeze) agent.

Public Input No. 103-NFPA 10-2023 [Section No. I.1 [Excluding any Sub-Sections]]

For convenience, the following checklists are organized into two parts. The first, Table I.1(a), is arranged by mechanical parts (components and containers) common to most fire extinguishers. The second, Table I.1(b), is arranged by extinguishing material and expelling means and involves a description of the problems peculiar to each agent.

Table I.1(a) Mechanical Parts Maintenance Checklist

-	**Cylinder/Shell**	-	**Corrective Action**
1. Hydrostatic test date or date of manufacture	1.	Retest, if needed	
2. Corrosion	2.	Conduct hydrostatic test and refinish, or condemn	
3. Mechanical damage (denting or abrasion)	3.	Conduct hydrostatic test and refinish, or condemn	
4. Paint condition	4.	Refinish	
5. Presence of repairs (welding, soldering, brazing, etc.)	5.	Condemn	
6. Damaged threads (corroded, crossthreaded, or worn)	6.	Condemn	
7. Broken hanger attachment, carrying handle lug	7.	Condemn	
8. Sealing surface damage (nicks or corrosion)	8.	Condemn	
-	**Nameplate**	-	**Corrective Action**
1. Illegible wording	1.	Clean or replace (Note: Only labels without a listing mark can be replaced.)	
2. Corrosion or loose plate	2.	Inspect shell under plate (see cylinder/shell check points) and reattach plate	
-	**Nozzle or Horn**	-	**Corrective Action**
1. Deformed, damaged, or cracked	1.	Replace	
2. Blocked openings	2.	Clean	
3. Damaged threads (corroded, crossthreaded, or worn)	3.	Replace	
4. Aged (brittle)	4.	Replace	
-	**Hose Assembly**	-	**Corrective Action**
1. Damaged (cut, cracked, or worn)	1.	Replace	
2. Damaged couplings or swivel joint (cracked or corroded)	2.	Replace	
3. Damaged threads (corroded, crossthreaded, or worn)	3.	Replace	
4. Inner tube cut at couplings	4.	Replace or consult manufacturer	
5. Electrically nonconductive between couplings (CO_2 hose only)	5.	Replace	
6. Hose obstruction	6.	Remove obstruction or replace	
7. Hydrostatic test date	7.	Retest if needed	
-	**Pull/Ring Pin**	-	**Corrective Action**
1. Damaged (bent, corroded, or binding)	1.	Replace	
2. Missing	2.	Replace	

-	Gauge or Pressure-Indicating Device	-	Corrective Action
1. Immovable, jammed, or missing pointer (pressure test)	1.	Depressurize and replace gauge	
2. Missing, deformed, or broken crystal	2.	Depressurize and replace gauge	
3. Illegible or faded dial	3.	Depressurize and replace gauge	
4. Corrosion	4.	Depressurize and check calibration, clean and refinish, or replace gauge	
5. Dented case or crystal retainer	5.	Depressurize and check calibration, or replace gauge	
6. Immovable or corroded pressure-indicating stem (nongauge type)	6.	Depressurize and discard shell	
7. Verify gauge compatibility	7.	Depressurize and replace	

-	Shell or Cylinder Valve	-	Corrective Action
1. Corroded, damaged, or jammed lever, handle, spring, stem, or fastener joint	1.	Depressurize, check freedom of movement, and repair or replace	
2. Damaged outlet threads (corroded, crossthreaded, or worn)	2.	Depressurize and replace	

-	Nozzle Shutoff Valve	-	Corrective Action
1. Corroded, damaged, jammed, or binding lever, spring, stem, or fastener joint	1.	Repair and lubricate, or replace	
2. Plugged, deformed, or corroded nozzle tip or discharge passage	2.	Clean or replace	

-	Puncture Mechanism	-	Corrective Action
1. Damaged, jammed, or binding puncture lever, stem, or fastener joint	1.	Replace	
2. Dull or damaged cutting or puncture pin	2.	Replace	
3. Damaged threads (corroded, crossthreaded, or worn)	3.	Replace	

-	Expellant/Gas Cartridge	-	Corrective Action
1. Corrosion	1.	Replace with correct expellant gas cartridge	
2. Damaged seal disc (injured, cut, or corroded)	2.	Replace with correct expellant gas cartridge	
3. Damaged threads (corroded, crossthreaded, or worn)	3.	Replace with correct expellant gas cartridge	
4. Illegible weight markings	4.	Replace with correct expellant gas cartridge	
5. Improper gas cartridge	5.	Replace with correct expellant gas cartridge	
6. Improper cartridge seal	6.	Replace with correct expellant gas cartridge	

-	Gas Cylinders	-	Corrective Action
1. Hydrostatic test date or date of manufacture	1.	Retest if needed	

2. Corrosion	2.	Conduct hydrostatic test and refinish, or discard	
3. Paint condition	3.	Refinish	
4. Presence of repairs (welding, soldering, brazing, etc.)	4.	Condemn	
5. Damaged threads (corroded, crossthreaded, or worn)	5.	Condemn	
-	**Fill Cap**	-	**Corrective Action**
1. Corroded, cracked, or broken	1.	Replace	
2. Damaged threads (corroded, crossthreaded, or worn)	2.	Replace	
3. Sealing surface damage (nicked, deformed, or corroded)	3.	Clean, repair, and leak test, or replace	
4. Obstructed vent hole or slot	4.	Clean	
-	**Nonrechargeable Shell/Cylinder**	-	**Corrective Action**
1. Corrosion	1.	Depressurize and discard	
2. Damaged seal disc (injured, cut, or corroded)	2.	Depressurize and discard	
3. Damaged threads (corroded, crossthreaded, or worn)	3.	Depressurize and discard	
4. Illegible weight or date markings	4.	Depressurize and discard	
-	**Carriage and Wheels**	-	**Corrective Action**
1. Corroded, bent, or broken carriage	1.	Repair or replace	
2. Damaged wheel (buckled or broken spoke, bent rim or axle, loose tire, low pressure, jammed bearing)	2.	Clean, repair, and lubricate, or replace	
-	**Carrying Handle**	-	**Corrective Action**
1. Broken handle lug	1.	Condemn cylinder or consult manufacturer regarding repair	
2. Broken handle	2.	Replace	
3. Corroded, jammed, or worn fastener	3.	Clean or replace	
-	**Tamper Seals or Indicators**	-	**Corrective Action**
1. Broken or missing	1.	Check Table I.1(b) for specific action	
2. Fill cap indicator corroded or inoperative	2.	Repair, clean, or replace	
3. Fill cap indicator operated	3.	Depressurize unit, check content, refill	
-	**Hand Pump**	-	**Corrective Action**
1. Corroded, jammed, or damaged pump	1.	Repair and lubricate, or replace	
2. Improper adjustment of packing nut	2.	Adjust	
-	**Pressurizing Valve**	-	**Corrective Action**
1. Leaking seals	1.	Depressurize and replace valve or core	
-	**Gasket and “O” Ring Seals**	-	**Corrective Action**
1. Damaged (cut, cracked, or worn)	1.	Replace and lubricate	
2. Missing	2.	Replace and lubricate	

3. Aged or weathered (compression set, brittle, cracked)	3.	Replace and lubricate	
-	**Brackets and Hangers**	-	**Corrective Action**
1. Corroded, worn, or bent	1.	Repair and refinish, or replace	
2. Loose or binding fit	2.	Adjust fit or replace	
3. Worn, loose, corroded, or missing screw or bolt	3.	Tighten or replace	
4. Worn bumper, webbing, or grommet	4.	Replace	
5. Improper type	5.	Replace	
-	**Gas Tube and Siphon or Pickup Tube**	-	**Corrective Action**
1. Corroded, dented, cracked, or broken	1.	Replace	
2. Blocked tube or openings in tube	2.	Clean or replace	
-	**Safety Relief Device**	-	**Corrective Action**
1. Corroded or damaged	1.	Depressurize and replace	
2. Broken, operated, or plugged	2.	Depressurize and replace	
-	**Pressure Regulators**	-	**Corrective Action**
1. External condition: damaged or corroded	1.	If damaged, replace regulator; if corroded, clean regulator or replace	
2. Pressure relief (corroded, plugged, dented, leaking, broken, or missing)	2.	Disconnect regulator from pressure source, replace pressure relief, or replace regulator	
3. Protective bonnet relief hole (tape missing or seal wire broken or missing)	3.	Replace regulator	
4. Adjusting screw (lock pin missing)	4.	Replace regulator	

Table I.1(b) Agent and Expelling Means Maintenance Checklist

-	~~AFFF and FFP~~	-	**Foam**	**Corrective Action**
1. Recharging date due	1.	Empty, clean, and recharge		
2. Improper fill levels	2.	Empty, clean, and recharge		
3. Agent condition (check for sediment)	3.	Empty, clean, and recharge		
4. Improper fill level (by weight or observation)	4.	Empty and recharge with new solution		
5. Agent condition (presence of precipitate or other foreign matter)	5.	Empty and recharge with new solution		
6. Improper gauge pressure	6.	Repressurize and leak test		
7. Broken or missing tamper indicator	7.	Leak test, replace indicator		
Self-Expelling				
-	**Carbon Dioxide**	-		**Corrective Action**

1. Improper weight	1.	Recharge to proper weight	
2. Broken or missing tamper indicator	2.	Leak test and weigh, also recharge or replace seal	
-	**Halon 1301 Bromotrifluoromethane**	-	**Corrective Action**
1. Punctured cylinder seal disc	1.	Replace shell	
2. Improper weight	2.	Replace shell or return to manufacturer for refilling	
3. Broken or missing tamper seal	3.	Examine cylinder seal disc, replace seal	
-	**Combination Halon 1211/1301**	-	**Corrective Action**
1. Improper weight	1.	Return to manufacturer *(See 7.2.3.3.)*	
2. Broken or missing tamper seal	2.	Return to manufacturer *(See 7.2.3.3.)*	
Manually Operated			
-	**Mechanical Pump Water and Loaded Stream**	-	**Corrective Action**
1. Improper fill level	1.	Refill to proper level	
2. Defective pump	2.	Clean, repair, and lubricate, or replace	
-	**Dry Powder Pail**	-	**Corrective Action**
1. Improper fill level	1.	Refill	
2. Agent condition (contamination or caking)	2.	Discard and replace	
3. Missing scoop	3.	Replace	
Gas Cartridge or Cylinder			
-	**Dry Chemical and Dry Powder Types**	-	**Corrective Action**
1. Improper weight or charge level	1.	Refill to correct weight or charge level	
2. Agent condition (contamination, caking, or wrong agent)	2.	Empty and recharge with new agent	
3. Cartridge	3.	-	
-	(a) Punctured seal disc	-	(a) Replace cartridge
-	(b) Improper weight	-	(b) Replace cartridge
-	(c) Broken or missing tamper indicator	-	(c) Examine seal disc, replace
-	(d) Improper cartridge seal	-	(d) Replace cartridge seal

4. Gas cylinder with gauge	4.	-	
-	(a) Low pressure	-	(a) Replace or recharge cylinder
-	(b) Broken or missing tamper seal	-	(b) Leak test, replace
5. Gas cylinder without gauge	5.	-	
-	(a) Low pressure (attach gauge and measure pressure)	-	(a) Leak test (if low, replace or recharge cylinder)
-	(b) Broken or missing tamper seal	-	(b) Measure pressure, leak test, replace seal

Stored-Pressure

-	**Combination Halon 1211/1301**	-	**Corrective Action**
1. Refillable	1.	-	
-	(a) Improper extinguisher agent	-	(a) Return to manufacturer *(See 7.2.3.3.)*
-	(b) Improper gauge pressure	-	(b) Return to manufacturer *(See 7.2.3.3.)*
-	(c) Broken or missing tamper seal	-	(c) Examine extinguisher, leak test, replace tamper seal
2. Nonrechargeable extinguisher with pressure indicator	2.	-	
-	(a) Low pressure	-	(a) Return to manufacturer *(See 7.2.3.3.)*
-	(b) Broken or missing tamper seal	-	(b) Return to manufacturer *(See 7.2.3.3.)*

-	**Dry Chemical and Dry Powder Types**	-	**Corrective Action**
1. Rechargeable	1.	-	
-	(a) Improper extinguisher weight	-	(a) Leak test and refill to correct weight
-	(b) Improper gauge pressure	-	(b) Repressurize and leak test
-	(c) Broken or missing tamper seal	-	(c) Leak test, check weight, and replace seal
2. Disposable shell with pressure indicator	2.	-	
-	(a) Punctured seal disc	-	(a) Depressurize and discard
-	(b) Low pressure	-	(b) Depressurize and discard

-	(c) Broken or missing tamper indicator	-	(c) Depressurize and discard
3. Disposable shell without pressure indicator	3.	-	
-	(a) Punctured seal disc	-	(a) Depressurize and discard
-	(b) Low weight	-	(b) Depressurize and discard
-	(c) Broken or missing tamper seal	-	(c) Depressurize and discard
4. Nonrechargeable extinguisher with pressure indicator	4.	-	
-	(a) Low pressure	-	(a) Depressurize and discard
-	(b) Broken or missing tamper indicator	-	(b) Depressurize and discard

-	**Wet Chemical Type**	-	**Corrective Action**
1. Improper fill level (by weight or observation)	1.	Empty and recharge with new agent to correct weight fill line	
2. Improper gauge pressure	2.	Repressurize and leak test or consult manufacturer	
3. Broken or missing tamper seal	3.	Verify fill level, recharge if required, replace tamper seal	

-	**Halogenated-Type Agents**	-	**Corrective Action**
1. Broken or missing tamper seal	1.	Verify level and pressure, recharge if required, replace tamper seal	
2. Improper gauge pressure	2.	Weigh, repressurize, and leak test or consult manufacturer	
3. Improper weight	3.	Leak test and recharge to correct weight	

-	**Water and Loaded Stream**	-	**Corrective Action**
1. Improper fill level (by weight or observation)	1.	Recharge to correct level in accordance with the manufacturer's manual	
2. Agent condition if antifreeze or loaded stream	2.	Empty and recharge with new agent	
3. Improper gauge pressure	3.	Repressurize and leak test or consult manufacturer	
4. Broken or missing tamper seal	4.	Leak test, replace seal	

Statement of Problem and Substantiation for Public Input

Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types.

Due to global regulation of PFAS based foam concentrates, including pre-mix solutions, of Film-Forming Foam as currently described in existing NFPA 10 Section 3.3.16* (i.e., AFFF, FFFP), the addition of new fluorine-free chemical-based foam concentrates and pre-mix solutions applicable definitions, chapter text and appendix related copy is required to update the next edition NFPA 10 Standard with respect to the use of foam in fire extinguishers.

Submitter Information Verification

Submitter Full Name: David Pelton
Organization: National Association of Fire Equipment Distributors
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 19 16:25:12 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-39-NFPA 10-2023
Statement: The term “foam” has been used to replace AFFF and FFFP to capture all chemical based foams and to remain consistent with other parts of NFPA10. AFFF and FFFP are still permitted in many parts of the US and the world.

Loaded stream is the industry term, so antifreeze has been deleted.

Public Input No. 57-NFPA 10-2023 [New Section after I.1.2]

Discard method of old or obsolete extinguishers:

Need to mention discard method at fire maintenance contractor facility, how to discard like discharge the extinguisher and remove the agent, then crash this cylinder with safety etc.

While should be Cleary mention about where to discard the removed agent as well.

Statement of Problem and Substantiation for Public Input

Question was asked that how to discard old extinguisher also how and where to dispose removed agent from this cylinder.

Submitter Information Verification

Submitter Full Name: Yousuf Imran
Organization: Fire Services
Affiliation: Saudi Council of Engineers
Street Address:
City:
State:
Zip:
Submittal Date: Tue Feb 28 00:34:16 EST 2023
Committee: PFE-AAA

Committee Statement

Resolution: A technical revision is not proposed, that the committee can act on.

Public Input No. 203-NFPA 10-2023 [Section No. K.1.2.4]

K.1.2.4 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096and ULC Standards, 171 Nepean Street, Suite 400, Ottawa, Ontario K2P 0B4, Canada . . .

UL 299, *Dry Chemical Fire Extinguishers*, 1984.

UL 299D, *Dry Chemical Fire Extinguishers For Residential Cooking Equipment*, 2010.

UL 711, ~~*Standard for Rating*~~ *Rating* and Fire Testing of Fire Extinguishers, 1984.

UL 711, ~~*Standard for*~~ *Rating and Fire Testing of Fire Extinguishers* , 2018.

UL 711, CAN/ULC-S508, *Rating and Fire Testing of Fire Extinguishers* , 2018 , revised 2023 .

UL 711A, *Fire Test Method for Portable Hand-Held Extinguishers Intended for Use On Residential Cooking Equipment*, 2018.

UL 1093, ~~*Standard for*~~ *Halogenated Agent Fire Extinguishers*, 1995, revised 2008.

Statement of Problem and Substantiation for Public Input

Add UL 711, CAN/ULC-S508, Rating and Fire Testing of Fire Extinguishers to ANNEX K because it is referenced in Annex A, as a Bi-National Standard, its address is added too.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 200-NFPA 10-2023 [Global Input]	
Public Input No. 201-NFPA 10-2023 [Section No. 2.3.4]	
Public Input No. 202-NFPA 10-2023 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 01 08:31:51 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-47-NFPA 10-2023
Statement: Publication references and organization addresses have been updated to be current. "Standard for" has been removed from all UL references as proposed in the public inputs.

Public Input No. 204-NFPA 10-2023 [Section No. K.1.2.5]

K.1.2.5 ULC Publications.

ULC Standards, 171 Nepean Street, Suite 400, Ottawa, Ontario K2P 0B4 Canada.

ULC/CAN-S512, ~~*Standard for Halogenated*~~ *Halogenated Agent Hand and Wheeled Fire Extinguishers*, 2005, reaffirmed 2007.

Statement of Problem and Substantiation for Public Input

Update UL standards to the current edition and revision.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 200-NFPA 10-2023 [Global Input]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 01 08:42:14 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-47-NFPA 10-2023
Statement: Publication references and organization addresses have been updated to be current. "Standard for" has been removed from all UL references as proposed in the public inputs.

Public Input No. 205-NFPA 10-2023 [Section No. K.1.2.6]

K.1.2.6 UL/ULC Publications.

The following publications are binationally harmonized standards for Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096, and ULC Standards, 171 Nepean ST, Suite 400, Ottawa, Ontario K2P 0B4, Canada.

UL 299, CAN/ULC-S504, ~~*Standard for Dry*~~ *Dry Chemical Fire Extinguishers*, 2018.

UL 711, CAN/ULC-S508, ~~*Standard for*~~ *r the Rating and Fire Testing of Fire Extinguishers*, ~~2018~~ 2023 .

UL 2129, CAN/ULC-S566, ~~*Standard for Halocarbon*~~ *Halocarbon Clean Agent Fire Extinguishers*, 2017.

Statement of Problem and Substantiation for Public Input

Update UL standards to the current edition and revision.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 200-NFPA 10-2023 [Global Input]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 01 08:45:05 EDT 2023
Committee: PFE-AAA

Committee Statement

Resolution: FR-47-NFPA 10-2023
Statement: Publication references and organization addresses have been updated to be current. "Standard for" has been removed from all UL references as proposed in the public inputs.