MEETING MINUTES

NFPA Technical Committee on Portable Fire Extinguishers (PFE-AAA)
NFPA 10 First Draft Meeting (A2025)

October 31 – November 2, 2023
8:00am – 5:00pm (ET)

Marriott Boston Quincy
1000 Marriott Drive
Quincy, MA 02169

1. **Call to order.** David Lowery, chair, called the meeting to order at 8:00am on October 31.
2. **Introductions.** NFPA staff took attendance.
3. **Staff liaison report.** Heath Dehn provided an overview of the standards development process and the revision cycle schedule.
   a. **Representation.** When asked to do so, no committee members declared that they had been retained by another organization to represent an interest category different from their membership interest category reflected on the technical committee roster.
4. **Previous meeting minutes.** The minutes from September 2020 web/teleconference were approved without revision. **See Attachment A**
5. **NFPA 110 First Draft.**
   a. **Review of Public Inputs.** The Technical Committee reviewed the Public Inputs (PIs) and developed Committee Inputs and First Revisions as necessary. These will be available in the First Draft Report at www.nfpa.org/10next.
   b. **New Task groups.** The following task group was appointed to work subsequent to the meeting:
      i. **NFPA References**.
         1. Scope. Review the various NFPA documents referenced in NFPA 10 and determine where a reference is no longer appropriate. Where a refence is determined to not be appropriate, the task group will recommend either deleting or changing the referenced NFPA document. Each change to a referenced NFPA document in NFPA 10 must be substantiated by the task group for review by the technical committee at the Second Draft meeting.
         2. Members. Robert Taylor (chair), Dwayne Garriss*, Kevin Holbrook, and JR Nerat *Non-committee Member

c. **Discharged Task Groups.** The following task groups provided a report and have been discharged with thanks:

i. Task Group 1.

1. Scope. Review PIs submitted to sections in Chapters 1 through 4. Provide recommended actions and substantiations for the technical committee to consider.
2. Chair. Douglas Fisher
3. Report available in **Attachment B**.

ii. Task Group 2.

1. Scope. Review PIs submitted to sections in Chapter 5. Provide recommended actions and substantiations for the technical committee to consider.
2. Chair. Blake Shugarman
3. Report available in **Attachment C**.

iii. Task Group 3.

1. Scope. Review PIs submitted to sections in Chapter 6. Provide recommended actions and substantiations for the technical committee to consider.
2. No chair appointed and no report provided.

iv. Task Group 4.

1. Scope. Review PIs submitted to sections in Chapter 7. Provide recommended actions and substantiations for the technical committee to consider.
2. No chair appointed and no report provided.

v. Task Group 5.

1. Scope. Review PIs submitted to sections in Chapter 8 and Annex B through Annex K. Provide recommended actions and substantiations for the technical committee to consider.
2. Chair. Lennon Peake
3. Report available in **Attachment D**.

d. **Presentation(s).** The committee heard presentations from the following individuals.

i. Introducing New Category L: Elevating Lithium Battery Protection**.** Carl Baldassarra. Presentation attached. **See Attachment E**.

6. Other Business.

7. **Future meetings.** The next committee meeting will be late in 2024. A meeting notification will be posted at www.nfpa.org/10next when the meeting is scheduled.

8. **Adjournment.** The meeting was adjourned at 5:36 on November 2nd.

Attendees

Committee Members:

✓	**David O. Lowrey**	Chair	City of Boulder Fire Rescue
✓	**Heath Dehn**	Staff Liaison	National Fire Protection Association
✓	**Nathaniel J. Addleman**	Principal	Addleman Engineering PLLC
✓	**Bradley Austin**	Principal	Poole Fire Protection, Inc.
✓	**Scott A. Bailey**	Principal	Southern Power
✓	**Andrew J. Brady**	Principal	Nuclear Service Organization (NEIL)
✓	**Darrin Alan Bramwell**	Principal	Eagan Fire Department
	Tanner Burke	Principal	Jensen Hughes
✓	**Michael Connolly**	Principal	Jacobs Engineering
✓	**Mark T. Conroy**	Principal	Brooks Equipment Company
✓	**Dominick Crescenzo**	Principal	Fire Department City of New York (FDNY)
	Richard L. Day	Principal	Michigan State Fire Marshal's Office
✓	**Nils Deacon**	Principal	Mutual Service Office, Inc.
✓	**Danielle Felch**	Principal	Johnson Controls
✓	**Jason William Findley**	Principal	Koorsen Fire & Security
	Douglas W. Fisher	Principal	Fisher Engineering, Inc.
✓	**Tunzyaan Griffin**	Principal	HGS Engineering
	Nathan R. Hall	Principal	Campbell County Health
✓	**Stephen M. Hill**	Principal	Hillfire Forensics, Inc.
✓	**Carl Horst**	Principal	Security Fire Equipment Company, Inc.
✓	**Fred Knipper**	Principal	Duke University Fire Safety
✓	**Jacob Peter Lindquist**	Principal	Minnesota State Fire Marshals Division
✓	**Ronald C. Mauney**	Principal	Walter Kidde Portable Equipment, Inc.
✓	**John J. McSheffrey, Jr.**	Principal	Keltron Corporation/en-Gauge Inc./MIJA Industries, Inc.
✓	**J. R. Nerat**	Principal	National Presto Safety
✓	**Dan Osobka**	Principal	Brave Fire Protection
✓	**Lennon A. Peake**	Principal	Koffel Associates, Inc.
✓	**Sean Ramsey**	Principal	US Coast Guard
✓	**Blake M. Shugarman**	Principal	UL LLC
	Austin L. Smith	Principal	Consolidated Nuclear Security, LLC, Y-12
✓	**Robert C. Starcher**	Principal	Local 669 JATC
✓	**Lester W. Swanson**	Principal	Cleveland-Cliffs Burns Harbor LLC.

Attendees

Committee Members:

✓	**Robert J. Ross**	Voting Alternate	Amerex Corporation
✓	**Todd Robert Aerts**	Alternate	Johnson Controls, Inc.
	Kyle Martin Coleman	Alternate	Reliable Fire And Security
	William M. Dorfler	Alternate	JENSEN HUGHES
	Chris Hendrix	Alternate	Hendrix Fire Protection
✓	**Kevin P. Holbrook**	Alternate	Local 669 JATC
✓	**Roy C. Kimball**	Alternate	Brooks Equipment Company, LLC.
✓	**James McLean**	Alternate	Fisher Engineering
	John H. Miller	Alternate	US Coast Guard
✓	**Justin Nocchi**	Alternate	UL LLC
	James Rose	Alternate	en-Gauge Inc.
✓	**Robert D. Taylor**	Alternate	PRB Coal Users Group
	Andrew Thomas Tinsley	Alternate	Consolidated Nuclear Security

Guests:

Carl Baldassarra	Wiss, Janney, Elstner Associat
David Pelton	National Association of Fire Equipment Distributors
Jesse Corletto	EfireX
Marvin Garriss	Synergy Consortium Group, LLC
James Knowles	Amerex Fire
John Mason	Caltron

Total number in attendance: 40

NFPA Technical Committee on Portable Fire Extinguishers

NFPA 10 Second Draft Meeting (Annual 2021)
Virtual Meeting via Microsoft Teams
September 1-3, 2020

MEETING MINUTES

ATTENDANCE:

Nathaniel Addleman (Chair)	Addleman Engineering PLLC
Bradley Austin	Poole Fire Protection, Inc.
Darrin Bramwell	Eagan Fire Department
Michael Connolly	Jacobs Engineering
Mark Conroy	Brooks Equipment Company, LLC
Dominick Crescenzo	FDNY
Justin Daniels	The Center For Campus Fire Safety/Univ Of Oklahoma
Aaron Dickens	Delta Fire Systems REP: American Subcontractors Association of Utah
Danielle Felch	Johnson Controls
Douglas Fisher	Fisher Engineering, Inc.
Dwayne Garriss	Synergy Consortium Group, LLC REP: Fire Equipment Manufacturers' Association
Stephen Hill	JENSEN HUGHES
Carl Horst	Security Fire Equipment Co., Inc. REP: Georgia Association of Fire Safety Equipment Dealers, Inc.
Ardes Johnson	Entergy Services LLC REP: Edison Electric Institute
Guy Jones	Amerex Corporation
Fred Knipper	Duke University Fire Safety
Jacob Lindquist	Minnesota State Fire Marshals Division
Norbert Makowka	National Association of Fire Equipment Distributors REP: National Association of Fire Equipment Distributors
John McSheffrey	en-Gauge Inc.
Louis Nash	US Coast Guard
Lennon Peake	Koffel Associates, Inc. REP: American Society for Healthcare Engineering
David Phelan	Township of North Bergen - NJ
Blake Shugarman	UL LLC
Austin Smith	Consolidated Nuclear Security, LLC, Y-12
Lester Swanson	ArcelorMittal
Jason Findley – *ALT*	Koorsen Fire & Security REP: National Association of Fire Equipment Distributors

Chris Hendrix – *ALT*	Hendrix Fire Protection REF: Georgia Association of Fire Safety Equipment Dealers, Inc.
Chuck Kimball (Secretary) – *ALT*	Brooks Equipment Company, LLC
Sean Ramsey – *ALT*	US Coast Guard
*Robert Ross - *ALT*	Amerex Corporation
Robert Taylor - *ALT*	PRB Coal Users Group REP: Edison Electric Institute
Gregory Harrington (Acting Staff Liaison)	NFPA
Nicole Cassels (Guest)	NFPA
Mark Fessenden (Guest)	Johnson Controls
Stephen Ganoe (Guest)	NFPA
Jim Tidwell (Guest)	Tidwell Consulting REP: Fire Equipment Manufacturers' Association

*Voting September 3, 2020

CALL TO ORDER:

The meeting was called to order September 1, 2020, at 11:00 AM EDT by the Chair, Nat Addleman

INTRODUCTIONS AND ATTENDANCE

Committee Members and guests introduced themselves and their affiliations.

CHAIR'S COMMENTS AND AGENDA REVIEW:

Chair Addleman welcomed new committee members and reviewed the agenda for the Second Draft meeting.

REPORT OF NFPA 408 TASK GROUP

Committee Member Taylor presented the NPFA 408 Task Group Report. The Task Group met with a representative of the FAA. The key issue presented is that the training content is the most important part of the standard. Currently, NFPA 408 is off cycle from NFPA 10 and the next edition will become a consent document.

NFPA STAFF LIAISON PRESENTATION ON NFPA REVISION PROCESS AND A2021 CYCLE

Staff Liaison Harrington gave a presentation on the virtual meeting rules and voting procedures, procedures regarding conflicts of interest for members to follow, Committee Actions that can be used for preparing Second Draft, Standards Council's guidance on handling Public Comments containing "new material" for Second Draft, important dates remaining in this cycle, and the NFPA resources available to the committee members (www.NFPA.org/regs; Fire Protection Research Foundation; Document Information Pages).

APPROVAL OF PREVIOUS MEETING MINUTES

Minutes from the September 2019 First Draft meeting (September 24-26, 2019) were accepted as published.

PREPARATION OF THE SECOND DRAFT

a. The Committee reviewed and acted on 77 Public Comments for NFPA 10.

b. The Committee created 14 Second Revisions.

c. The Committee rejected and Held 6 Public Comments.

d. The Committee requested more study on Performance Based Options for Monthly Inspections and instructed NFPA Staff to contact the Fire Protection Research Foundation as a possible option.

e. The committee requested more study on damaged labels or tags and what to do in the event that they are damaged.

f. The committee requested more study on the practicality of requiring 75' travel distance requirements with regard to warehouses and other large areas.

g. The Committee requested NFPA Staff to give feedback to NFPA Standards Council regarding educating public as to rules for submitting Second Draft Comments due to a significant amount of new material proposed for Second Draft.

OTHER BUSINESS

There was no other business before the committee.

NEXT MEETING

TBD

ADJOURNMENT

No other business coming before the chair, the meeting was adjourned.

Submitted by Chuck Kimball, Committee Secretary

Attachment B

Section	PI	PAGE	DISPOSITION
Throughout NFPA 10	200	204	Create a First Revision based on PI 200
Proposed Text (PI)	**Remove "Standard for" from all UL, CAN/ULC standard titles.**		
Committee Text (FR)	Remove "Standard for" from all UL, CAN/ULC standard titles		
Statement	Agree that all UL/ULC documents referenced are standards and do not have "standard" in the title.		

Attachment B

Section	PI	PAGE	DISPOSITION
1.1	73	73	Resolve
Proposed Text (PI)	1.1 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.		
Committee Text (FR)			
Statement	The Committee disagrees with the proposed wording for a number of reasons. 1) This standard addresses fire extinguishers and the appropriate type of extinguishing agent. 2) There is not sufficient testing to determine what, if any, extinguishing agent is appropriate or not appropriate for batteries. 3) Battery chemistry is constantly changing and the general statement that this standard does not apply to lithium or other batteries is not appropriate. 4) The phrase "other technology batteries" is too broad as it doesn't indicate what technology. See Committee Statement on Public Input 172. ++++++++++++++++++++++++++++++++++ **Committee Statement on Public Input 172 from TG 2** 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		

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	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 technical committee is in general agreement with the findings in that report.

Attachment B

Section	PI	PAGE	DISPOSITION
A.1.1	137	148	Resolve

Proposed Text (PI)

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

	~~8.~~9. NFPA 18A ~~9.~~10. NFPA 96 ~~10.~~11. NFPA 750 ~~11.~~12. NFPA 2001
Committee Text (FR)	
Statement	NFPA 18A addresses water additives that might be added to fixed systems but not fixed systems themselves. A.1.1 provides a list of NFPA standard that provide criteria for fixed systems.

Attachment B

Section	PI	PAGE	DISPOSITION
2.2	59	55	Hold for TC
Proposed Text (PI)	[Update NFPA references to include NFPA 18A, Standard on Water Additives for Fire Control and Vapor Mitigation, 2022 edition.]		
Committee Text (FR)			
Statement	HOLD – Need to determine if NFPA 18A will be referenced in the standard.		

Attachment B

Section	PI	PAGE	DISPOSITION
New 2.3.10	143	153	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)	~~HOLD – Need to determine if NTA 8133 will be referenced in the standard.~~		
Statement	See Committee Statement on Public Input 172. NFPA 10 is an ANSI approved standard requiring portable fire extinguishers to be listed and labeled to meet or exceed the requirements of the ANSI approved standard covering the rating and fire testing of fire extinguishers, as well as, the applicable ANSI approved standard covering the performance requirements (reference NFPA 10, Section 4.1.1). Consideration of a Netherlands Technical Agreement, such as NEN-NTA 8133:2017, which is not an ANSI approved standard, for inclusion in ANSI/NFPA 10 is not appropriate. With regard to NEN-NTA 8133:2017, a complete and thorough review of the NTA (Netherlands Technical Agreement) has not been conducted. However, based on the review to date, the following information is provided that was instrumental in resolving this Public Input. 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-**		

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	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).

Attachment B

Section	PI	PAGE	DISPOSITION
2.3.3	75	74	Hold for TC
Proposed Text (PI)	[CGA references in section 2.3.3 are added only when appearing in mandatory text.]		
Committee Text (FR)			
Statement	HOLD – Revision dates for C-1 and C-10.1 are correct. Hold on other standards until added to body of NFPA 10.		

Attachment B

Section	PI	PAGE	DISPOSITION
2.3.4	201	205	Create a First Revision based on PI 201
Proposed Text (PI)	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.		
Committee Text (FR)	2.3.4 UL Publications. UL Standards and Engagement, ~~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	Agree. “Standard for” should be deleted from the title and UL 1803 revision date is most current. Updated designation to UL Standards and Engagement.		

Attachment B

Section	PI	PAGE	DISPOSITION
2.3.6	202	206	Create a First Revision based on PI 202
Proposed Text (PI)	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 Chemical Fire Extinguishers*, 2012, revised ~~2018~~2021. UL 626, CAN/ULC-S507, ~~*Standard for*~~ *Water Fire Extinguishers*, 2005, revised ~~2018~~2021. UL 711, CAN/ULC-S508, ~~*Standard for the*~~ *Rating and Fire Testing of Fire Extinguishers*, 2018, revised 2023. UL 2129, CAN/ULC-S566, ~~*Standard for*~~ *Halocarbon Clean Agent Fire Extinguishers*, 2017, revised 2021.		
Committee Text (FR)	2.3.6 UL/ULC Publications. The following publications are bi-nationally harmonized standards for UL Standards and Engagement, ~~Underwriters Laboratories Inc.,~~ 333 Pfingsten Road, Northbrook, IL 60062-2096, and ULC Standards, 100 Queen St., Suite 1040, Ottawa, Ontario K1P 1A5, ~~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 Chemical Fire Extinguishers*, 2012, revised ~~2018~~2021. UL 626, CAN/ULC-S507, ~~*Standard for*~~ *Water Fire Extinguishers*, 2005, revised ~~2018~~2021. UL 711, CAN/ULC-S508, ~~*Standard for the*~~ *Rating and Fire Testing of Fire Extinguishers*, 2018, revised 2023. UL 2129, CAN/ULC-S566, ~~*Standard for*~~ *Halocarbon Clean Agent Fire Extinguishers*, 2017, revised 2021.
Statement	Agree. “Standard for” should be deleted from the title and revision dates are most current. Updated address for ULC. Updated designation to UL Standards and Engagement.

Attachment B

Section	PI	PAGE	DISPOSITION
2.4	116	133	Hold for TC
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	HOLD – Add if used elsewhere in NFPA 10		

Attachment B

Section	PI	PAGE	DISPOSITION
New 3.3.X	192	196	
Proposed Text (PI)	3.3.1 Agent Suspension An aqueous stable mixture of solid particles that forms an extinguishing agent.		
Committee Text (FR)			
Statement	Hold for resolution of PI 191. Need more information as to how “agent suspension” is different from a wetting agent already addressed in NFPA 10.		

Commented [TG 11]: 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]

Attachment B

Section	PI	PAGE	DISPOSITION
3.3	76	75	Create First Revision
Proposed Text (PI)	3.3.X Certified. Documented recognition of an acceptable level of knowledge and competency, acceptable to the AHJ. 3.3.X Trained. The instruction necessary to safely and reliably perform service functions, in accordance with NFPA 10. 3.4.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.		
Committee Text (FR)	3.3.X Certified A formally stated recognition and approval of an acceptable level of competency, acceptable to the AHJ. **[**17, 2024] 3.3.X Trained A person who has undergone the instructions necessary to safely install and reliably perform the maintenance and recharge service in accordance with the manufacturer's installation and maintenance manual. [17, 2024] 3.4.X Hand Portable Fire Extinguisher. An extinguisher having a maximum specific gross weight.		
Statement	"Certified" extracted from NFPA 52/96. "Trained" taken from NFPA 17 but modified. For "hand" the TC needs to review where the term "hand fire extinguisher" or "hand extinguisher" is used and determine if its appropriate. If it is, a consensus is needed for the weight of a "hand" extinguisher. Are there concerns about "lifting" regulations (OSHA or similar) where only one person should/could lift.		

Commented [TG 12]: Reference, for example UL 299: 6.11 A hand portable extinguisher shall have a gross weight not exceeding 27 kg (60 lb).

Also reference, for example UL ProductiQ:

PRODUCT IDENTITY
One of the following product identities appears on the product:

Hand Fire Extinguisher - Classification [classification letter(s) and number(s)]

Water Fire Extinguisher - Classification [classification letter(s) and number(s)]

https://iq.ulprospector.com/en/profile?e=208046

Commented [TG 13]: Reference, for example UL 299: 19.1 A hand-portable extinguisher having a gross weight of 1.4 kg (3 lb) or more and having a cylinder diameter of 75 mm (3 in) or more, shall have a carrying handle

From this information, for gross weights less than 3 lb, handles are not required and have been deleted below.

Commented [TG 14]: If this is of concern, then the appropriate place to address would be in the performance standards referenced in Section 4.1.1. That is, proposals to the UL/ULC performance standards.

	The below comes from OSHA Question: Does OSHA have a statute that addresses procedures for lifting heavy objects? Response: OSHA does not have a standard which sets limits on how much a person may lift or carry. However, the National Institute for Occupational Safety and Health (NIOSH) has developed a mathematical model that helps predict the risk of injury based on the weight being lifted and other criteria. The NIOSH model is based on previous medical research into the compressive forces needed to cause damage to bones and ligaments of the back. The mathematical model is incorporated in the Applications Manual for the Revised NIOSH Lifting Equation, which can be found on the NIOSH website (http://www.cdc.gov/niosh/docs/94-110/). It should be noted, however, that this NIOSH document provides only voluntary guidelines The difficulty with assessing risks associated with lifting is that weight alone does not determine the risk for back injury. Other factors include: How often you are lifting something. Whether you bend or twist while lifting. How high an object is lifted. Where the origin of the lift occurs; specifically, whether it is below knuckle height. Whether you hold the object away from you while lifting. How long you lift or hold the object. Depending on these factors, an object that is safe to lift at one time can cause back problems another time. **NIOSH has a lifting equation (discussed in the above-referenced Applications Manual) for calculating a recommended weight limit for one person under different conditions. The lifting equation establishes a maximum load of 51 pounds, which is then adjusted to account for how often you are lifting, twisting of your back during lifting, the vertical distance the load is lifted, the distance**

	of the load from your body, the distance you move while lifting the load, and how easy it is to hold onto the load. Applications Manual for the Revised NIOSH Lifting Equation (94-110) | NIOSH | CDC Applications Manual for the Revised NIOSH Lifting Equation

Attachment B

Section	PI	PAGE	DISPOSITION
New 3.3.X and New A.3.3.X	127, 138	141, 149	Resolve
Proposed Text (PI)	3.3.X 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. A.3.3.X 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.		
Committee Text (FR)			
Statement	The term “encapsulator agent” should be defined in NFPA 18A if it is an appropriate term to be defined, as it is a wetting agent. 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.). Portable fire extinguishers used to comply with NFPA 10 shall be listed and labeled and shall 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). Encapsulator agent, as defined, is not an agent used in listed and labeled fire extinguishers.		

Attachment B

Section	PI	PAGE	DISPOSITION
3.3.10	38	37	Hold for TC
Proposed Text (PI)	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 extinguisher 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 electronically from hard-copy paper documents.		

Attachment B

Committee Text (FR)	Hold for now. If terms are used in NFPA 10… Create a First Revision 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 extinguisher 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 electronically from hard-copy paper documents.
Statement	HOLD – Need to ensure the terms are used in the body of NFPA 10 through other PIs. Agree with intent to separate the remote monitoring from the local signaling device. This is related to CI 51/PI 112 where the TC proposed these definitions at second draft.

Attachment B

Section	PI	PAGE	DISPOSITION
3.3.16	81	82	Create First Revision based on PI 81
Proposed Text (PI)	3.3.16* 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* Film-Forming Foam. A solution that will form an aqueous film on liquid fuels. 3.3.16.1.1* 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* 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* 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 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.		

Attachment B

Committee Text (FR)	3.3.16* Foam A stable aggregation of bubbles of lower density than oil or water. [11, 2021]. A.3.3.16 [11, 2021] Air foam is made by mixing air into a water solution containing a foam concentrate, by means of suitably designed equipment. It flows freely over a burning liquid surface and forms a tough, air-excluding, continuous blanket that seals volatile combustible vapors from access to air. It resists disruption from wind and draft or heat and flame attack and is capable of resealing in case of mechanical rupture. Firefighting foams retain these properties for relatively long periods of time. Foams also are defined by expansion and are arbitrarily subdivided into three ranges of expansion. These ranges correspond broadly to certain types of usage described below. The three ranges are as follows: (1) Low-expansion foam — expansion up to 20 (2) Medium-expansion foam — expansion from 20 to 200 (3) High-expansion foam — expansion from 200 to approximately 1000 3.3.16.1* Film-Forming Foam. A concentrate that when mixed at its nominal use concentration will form an aqueous film on hydrocarbon fuels. ~~A solution that will form an aqueous film on liquid fuels.~~ [11, 2021] 3.3.16.1.1* 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* 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* 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). [11, 2021] A.3.3.16.2 Synthetic Fluorine-Free Foam (SFFF). Contamination of per- and polyfluoroalkyl substances (PFAS) from equipment previously used with fluorinated foam concentrates or from environmental sources can potentially be found in synthetic fluorine-free foam concentrates that were not specifically manufactured using these substances. [11, 2021]
Statement	Agree with the intent to add these definitions. Foam definition is extracted from NFPA 11, section 3.3.10, 2021 edition. Film-forming foam is extracted from NFPA 11, Section 3.3.12.4, 2021 edition. SFFF is extracted from NFPA 11, Section 3.3.12.8, 2021 edition.

Attachment B

Section	PI	PAGE	DISPOSITION
3.4.9	64	65	Create a First Revision based on PI 64
Proposed Text (PI)	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.		
Committee Text (FR)	A fire extinguisher containing water-based agents, such as water, ~~film-forming~~ foam agents (AFFF, FFFP, SFFF), antifreeze, wetting agent~~wetting agent~~, loaded stream, and wet chemical.		
Statement	Added wetting agent as it is a type of water type fire extinguisher. It's the TGs opinion that an encapsulator agent is a type of wetting agent. Clarified foam as it applies to more than just "film-forming" foams.		

Commented [TG 15]: The encapsulator agent is not a water-based agent used in listed and labeled extinguishers covered by 4.1.1.

Attachment B

Section	PI	PAGE	DISPOSITION
3.4.9	82	84	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	See FR regarding PI 64		

Attachment B

Section	PI	PAGE	DISPOSITION
New Definitions	112	126	
Proposed Text (PI)	**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.		
Committee Text (FR)	Resolve		

Statement	See PI 38

Attachment B

Section	PI	PAGE	DISPOSITION
4.1.1	145	155	Resolve
Proposed Text (PI)	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* ~~(6)~~(7) Class L types: (NEN) NTA 8133:2021, *Portable Fire Extinguishers- Preformance requirments, tests methods and marking for suitability for extinguishing Lithium Battery Fires.*		
Committee Text (FR)			
Statement	The section noted in the PI is for the “type” of extinguishing agent, not the hazard class ~~(i.e. Class L). The NEN standard, in theory, would be equivalent to UL 711.~~ See Committee Statement on Public Input 172.		

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	NFPA 10 is an ANSI approved standard requiring portable fire extinguishers to be listed and labeled to meet or exceed the requirements of the ANSI approved standard covering the rating and fire testing of fire extinguishers, as well as, the applicable ANSI approved standard covering the performance requirements (reference NFPA 10, Section 4.1.1). Consideration of a Netherlands Technical Agreement, such as NEN-NTA 8133:2017, which is not an ANSI approved standard, for inclusion in ANSI/NFPA 10 is not appropriate. With regard to NEN-NTA 8133:2017, a complete and thorough review of the NTA (Netherlands Technical Agreement) has not been conducted. However, based on the review to date, the following information is provided that was instrumental in resolving this Public Input. 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).

Attachment B

Section	PI	PAGE	DISPOSITION
4.1.1	171	175	Resolve
Proposed Text (PI)	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* ~~(6)~~(7) Encapsulating types: UL XXX, CAN/ULC-XXX, *Standard for Encapsulator Agent Fire Extinguishers* [Reserve]		
Committee Text (FR)	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*		

Attachment B

	(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) Water-based types: ~~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*
Statement	An encapsulator agent, as proposed for inclusion in this standard and intended for use in a fire extinguisher, is a type of water based agent. ~~There is currently no UL or ULC standard for encapsulator agents, therefore, nothing can be listed. A "reserve" line does not need to be added. Once the UL or ULC standard is adopted, it can be brought into this standard.~~

Attachment B

Section	PI	PAGE	DISPOSITION
4.1.4	170	174	Resolve
Proposed Text (PI)	4.1.4 Extinguishers listed for the Class C or Class Lrating shall not contain an agent that is a conductor of electricity.		
Committee Text (FR)			
Statement	Class L has not been defined as a separate classification of a fire (see Section 5.2). See Committee Statement on Public Input 172.		

Attachment B

Section	PI	PAGE	DISPOSITION
4.2	13	6	Create a First Revision
Proposed Text (PI)	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		
Committee Text (FR)	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	Agree with submitter. The proper term is now "Safety Data Sheet (SDS)."

Attachment B

Section	PI	PAGE	DISPOSITION
A.4.2	14	7	Create a First Revision
Proposed Text (PI)	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]
Committee Text (FR)	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.
Statement	Agree with submitter. The proper term is now "Safety Data Sheet (SDS)."

Attachment B

Section	PI	PAGE	DISPOSITION
4.3.2	29	28	Create a First Revision based on PI 29
Proposed Text (PI)	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.		
Committee Text (FR)	The manual shall refer to this standard as a source of ~~detailed instruction.~~ Requirements regarding the selection, installation, placement, and servicing of the portable fire extinguishers.		
Statement	Agree with submitter, however, since NFPA 10 is a standard, it provides requirements vs. additional information.		

Commented [TG 16]: Recommended FR consistent with 4.1.1: The manual shall refer to this standard as a source of additional provisions.

Attachment B

Section	PI	PAGE	DISPOSITION
4.4	83	85	Create a First Revision
Proposed Text (PI)	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)		
Committee Text (FR)	~~(2) Chemical foam (excluding film-forming agents)~~ (2) Chemical foam (e.g, sodium bicarbonate with aluminium sulphate)		
Statement	All foams are chemical based. AFFF, 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. Deleting the line entirely clears up any confusion.		

Commented [TG 17]: Deleting the line would not allow the user to know these types are considered obsolete and shall be removed from service.

Also reference:

https://www.marineinsight.com/marine-safety/different-types-of-fire-extinguishers-used-on-ships/

Attachment B

Section	PI	PAGE	DISPOSITION
K.1.2.4	203		Create a First Revision based on PI 203
Proposed Text (PI)	Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096 and 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.		
Committee Text (FR)	UL Standards and Engagement, ~~Underwriters Laboratories Inc.,~~ 333 Pfingsten Road, Northbrook, IL 60062-2096 UL 299, Dry Chemical Fire Extinguishers, 1984. UL 299D, Dry Chemical Fire Extinguishers For Residential Cooking Equipment, 2010. UL 711, ~~Standard for~~ Rating and Fire Testing of Fire Extinguishers, 1984. ~~UL 711, Standard for Rating and Fire Testing of Fire Extinguishers, 2018.~~		

Commented [TG 18]: Referenced in A.4.4.1

Commented [TG 19]: Referenced in A.4.4.1

Attachment B

	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	This section is for UL publications only, not ULC or combined UL/ULC standards therefore the reference to ULC is not applicable. Removed "standard for" and updated the revision dates to match other PIs. Deleted UL 299 and 711 as both are UL/ULC standards and belong in K.1.2.6

Section	PI	PAGE	DISPOSITION
K.1.2.5	204		Create a First Revision based on PI 204
Proposed Text (PI)	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.		
Committee Text (FR)	ULC Standards, 100 Queen St., Suite 1040, Ottawa, Ontario K1P 1A5, ~~171 Nepean Street, Suite 400, Ottawa, Ontario K2P 0B4~~ Canada. ULC/CAN-S512, ~~Standard for~~ Halogenated Agent Hand and Wheeled Fire Extinguishers, 2005, reaffirmed 2007		
Statement	Agree with removing "Standard for." Updated address for ULC.		

Section	PI	PAGE	DISPOSITION
K.1.2.6	205		
Proposed Text (PI)	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, revised 2021.
Committee Text (FR)	K.1.2.6 UL/ULC Publications. The following publications are binationally harmonized standards for UL Standards and Engagement, ~~Underwriters Laboratories Inc.,~~ 333 Pfingsten Road, Northbrook, IL 60062-2096, and ULC Standards, 100 Queen St., Suite 1040, Ottawa, Ontario K1P 1A5, ~~171 Nepean ST, Suite 400, Ottawa, Ontario K2P 0B4,~~ Canada. UL 299, CAN/ULC-S504, ~~Standard for~~ Dry Chemical Fire Extinguishers, 2018, revised 2021. UL 711, CAN/ULC-S508, ~~Standard for~~ Rating and Fire Testing of Fire Extinguishers, 2018, revised 2023. UL 2129, CAN/ULC-S566, ~~Standard for~~ Halocarbon Clean Agent Fire Extinguishers, 2017, revised 2021.
Statement	Agree with removing “Standard for” and updating UL 711 date. UL 299 and 711 are located here, therefore, they do not need to be located again in K.1.2.4. Updated address for ULC. QUESTION FOR STAFF: Some of these documents are listed in Chapter 2. Should they be listed in both Chapter 2 and Annex K?

Section	PI	PAGE	DISPOSITION
2.2			Create a First Revision
Proposed Text (PI)			

Attachment B

Committee Text (FR)	NFPA 460, Standard for Aircraft Rescue and Firefighting Services at Airports, 2024 edition. ~~NFPA 403, Standard for Aircraft Rescue and Fire-Fighting Services at Airports, 2018 edition.~~
Statement	NFPA 403 is not referenced in NFPA 10. NFPA 403 has also been combined with NFPA 460.

Section	PI	PAGE	DISPOSITION
2.2			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	~~NFPA 484, Standard for Combustible Metals, 2022 edition.~~ NFPA 660, Standard for Combustible Dusts, 2024		
Statement	NFPA 484 has been combined into NFPA 660		

Section	PI	PAGE	DISPOSITION
2.2			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	~~NFPA 655, Standard for Prevention of Sulfur Fires and Explosions, 2017 edition~~.		
Statement	NFPA 655 is not referenced in NFPA 10. NFPA 655 has also been combined with NFPA 660.		

Section	PI	PAGE	DISPOSITION
2.2			Create a First Revision

Attachment B

Proposed Text (PI)	
Committee Text (FR)	NFPA 1140, Standard for Wildland Fire Protection, 2022 edition. ~~NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas, 2017 edition.~~
Statement	NFPA 1141 is not referenced in NFPA 10. NFPA 1141 has also been combined into NFPA 1140

Section	PI	PAGE	DISPOSITION
2.2			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	NFPA 1225, Standard for Emergency Services Communications, 2022 edition. ~~NFPA 1221, Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems, 2019 edition.~~		
Statement	NFPA 1221 is not referenced in NFPA 10. NFPA 1221 has also been combined into NFPA 1225		

Section	PI	PAGE	DISPOSITION
2.2			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	NFPA 1900, Standard for Aircraft Rescue and Firefighting Vehicles, Automotive Fire Apparatus, Wildland Fire Apparatus, and Automotive Ambulances, 2024 edition. ~~NFPA 1901, Standard for Automotive Fire Apparatus, 2016 edition.~~		

	~~NFPA 1906, Standard for Wildland Fire Apparatus, 2016 edition.~~
Statement	NFPA 1091 and 1906 are not referenced in NFPA 10. NFPA 1901 and 1906 have also been combined into NFPA 1900

Section	PI	PAGE	DISPOSITION
2.2			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	NFPA 1910, Standard for the Inspection, Maintenance, Refurbishment, Testing, and Retirement of In-Service Emergency Vehicles and Marine Firefighting Vessels, 2024 edition. ~~NFPA 1925, Standard on Marine Fire-Fighting Vessels, 2018 edition.~~		
Statement	NFPA 1925 is not referenced in NFPA 10. NFPA 1925 has also been combined into NFPA 1910.		

Section	PI	PAGE	DISPOSITION
2.2			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	~~NFPA 1962, Standard for the Care, Use, Inspection, Service Testing, and Replacement of Fire Hose, Couplings, Nozzles, and Fire Hose Appliances, 2018 edition.~~ NFPA 1930, Standard on Fire and Emergency Service Use of Thermal Imagers, Two-Way Portable RF Voice Communication Devices, Ground Ladders, and Fire Hose, and Fire Hose Appliances, 2024 edition.		
Statement	NFPA 1962 been combined into NFPA 1930.		

Commented [TG 110]: Is this in process? This standard was not located on https://codesonline.nfpa.org/

Attachment B

Section	PI	PAGE	DISPOSITION
7.5			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	7.5 Hose Station Maintenance. Where hose stations are installed to comply with 6.2.1.4, they shall be maintained in accordance with NFPA ~~1962~~1930.		
Statement	NFPA 1962 been combined into NFPA 1930.		

Section	PI	PAGE	DISPOSITION
A.6.5.3			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	A.6.5.3 See NFPA ~~484~~ 660 for additional information.		
Statement	NFPA 484 has been combined into NFPA 660		

Section	PI	PAGE	DISPOSITION
A.6.5.4			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	A.6.5.4 See NFPA ~~484~~ 660 for additional information.		
Statement	NFPA 484 has been combined into NFPA 660		

Section	PI	PAGE	DISPOSITION

Attachment B

A.5.5.4.8.2			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	A.5.5.4.8.2 Consult NFPA ~~484~~ 660 for use and limitations of these agents and other nonlisted alternatives.		
Statement	NFPA 484 has been combined into NFPA 660		

Section	PI	PAGE	DISPOSITION
A.5.3.2.4			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	A.5.3.2.4 See NFPA ~~484~~ 660 for additional information.		
Statement	NFPA 484 has been combined into NFPA 660		

Section	PI	PAGE	DISPOSITION
A.6.5.1			Create a First Revision
Proposed Text (PI)			
Committee Text (FR)	A.6.5.1 Additional information on Class D agents is provided in NFPA ~~484~~660. The operation of Class D fire extinguishers is much different from that of dry chemical extinguishers rated for Class A, B, or C.		
Statement	NFPA 484 has been combined into NFPA 660		

Attachment C

Section	PI	PAGE	DISPOSITION
5.2.2	31	30	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	The current text is appropriate to describe Class B fires.		

Section	PI	PAGE	DISPOSITION
New after 5.2.5	62	60	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	See Committee Statement on Public Input 172.		

Section	PI	PAGE	DISPOSITION
New after 5.2.5	69	68	
Proposed Text (PI)	5.2.6 Class T Fires.		

	Class T fires are fire that involve Lithium style batteries and other technologies.
Committee Text (FR)	
Statement	See Committee Statement on Public Input 172.

Section	PI	PAGE	DISPOSITION
New after 5.2.5	172	176	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	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 technical committee is in general agreement with the findings in that report.

Section	PI	PAGE	DISPOSITION
5.3.1.2	117, 173	134, 178	Resolve
Proposed Text (PI)	5.3.1.2 Fire extinguishers classified for use on Class C, Class D, ~~or~~ Class K, or Class L hazards shall not be required to have a number preceding the classification letter.		
Committee Text (FR)			
Statement	See Committee Statement on Public Input 172.		

Section	PI	PAGE	DISPOSITION
New after 5.3.2.5	63	64	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	See Committee Statement on Public Input 172.		

Section	PI	PAGE	DISPOSITION
New after 5.3.2.5	71	70	Resolve

Proposed Text (PI)	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.
Committee Text (FR)	
Statement	See Committee Statement on Public Input 172.

Section	PI	PAGE	DISPOSITION
New after 5.3.2.6	174	179	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	See Committee Statement on Public Input 172. In addition, extinguishing agents for the protection of Class L hazards are not considered in the Submitters Substantiation.		

Section	PI	PAGE	DISPOSITION
New 5.5.2.1	25	22	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			

Statement	Class C fires are fires that involve energized electrical equipment (Reference NFPA 10, Section 5.2.3). Also reference NFPA 10, Section 5.5.3.

Section	PI	PAGE	DISPOSITION
New after 5.5.2	10	4	Resolve
Proposed Text (PI)	**Hanged automatic sprinkler fire extinguishers** Hanged automatic sprinkler fire extinguishers are not tested or allowed to be used		
Committee Text (FR)			
Statement	An automatic sprinkler fire extinguisher as described is not a portable fire extinguisher (Reference NFPA 10, Section 3.4.3). 3.4.3 Portable Fire Extinguisher. A portable device, carried or on wheels and operated by hand, containing an extinguishing agent that can be expelled under pressure for the purpose of suppressing or extinguishing fire.		

Section	PI	PAGE	DISPOSITION
5.5.3.1	118	135	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	See Committee Statement on Public Input 172.		

Attachment C

Section	PI	PAGE	DISPOSITION
New 5.5.4.2.6	124	138	Resolve
Proposed Text (PI)	**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.		
Committee Text (FR)			
Statement	See Committee Statement on Public Input 172.		

Section	PI	PAGE	DISPOSITION
5.5.4.2 & A.5.5.4.2	119, 153	136, 159	Resolve
Proposed Text (PI)	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. 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.		
Committee Text (FR)			

Statement	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).

Section	PI	PAGE	DISPOSITION
5.5.4.3	120	137	Resolve
Proposed Text (PI)	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)		
Committee Text (FR)			
Statement	There is insufficient information to support water based encapsulating agent fire extinguishers as being effective at vapor-suppressing and extinguishing obstacle fires.		

Section	PI	PAGE	DISPOSITION
5.5.4.4	84	82	Create a First Revision based on Public Input 84
Proposed Text (PI)	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.
Committee Text (FR)	5.5.4.4* Water-Soluble Liquid Fires (Polar Solvents). 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	There are several different types of foam fire extinguishers listed and labeled for this type of application.

Section	PI	PAGE	DISPOSITION
5.5.4.6.1	39	37	Resolve
Proposed Text (PI)	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.)*		
Committee Text (FR)			
Statement	A.5.5.4.6 provides guidance to the user regarding delicate electronic equipment.		

Section	PI	PAGE	DISPOSITION
5.5.4.6.1	106	120	Resolve
Proposed Text (PI)	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.)*		
Committee Text (FR)			

Attachment C

Statement	A.5.5.4.6 provides guidance to the user regarding delicate electronic equipment.

Section	PI	PAGE	DISPOSITION
5.5.4.6.2	40	38	Resolve
Proposed Text (PI)	5.5.4.6.2* Dry chemical fire extinguishers shall not be installed for the protection of ~~delicate~~ life safety and mission critical electronic equipment.		
Committee Text (FR)			
Statement	A.5.5.4.6 provides guidance to the user regarding delicate electronic equipment.		

Section	PI	PAGE	DISPOSITION
5.5.4.6.2	107	121	Resolve
Proposed Text (PI)	~~5.5.4.6.2*~~ ~~Dry chemical fire extinguishers shall not be installed for the protection of delicate electronic equipment.~~		
Committee Text (FR)			
Statement	A.5.5.4.6 provides guidance to the user regarding delicate electronic equipment.		

Section	PI	PAGE	DISPOSITION
A.5.5.4.6.2	109	123	Resolve
Proposed Text (PI)	A.5.5.4.6.~~2~~ 1 Dry chemical residue will probably not be able to be completely and immediately removed~~,~~ from electronics that are not sealed or weather		

	proof and, in addition, multipurpose dry chemical 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.
Committee Text (FR)	
Statement	A.5.5.4.6.2 provides guidance to the user regarding the use of these types of fire extinguishers.

Section	PI	PAGE	DISPOSITION
5.5.4.7.1	125	139	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	There is insufficient information to support water based encapsulating agent fire extinguishers as being effective for areas containing oxidizers.		

Section	PI	PAGE	DISPOSITION
New 5.5.4.9	70	65	Resolve
Proposed Text (PI)	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.		

Attachment C

Committee Text (FR)	
Statement	See Committee Statement on Public Input 172.

Section	PI	PAGE	DISPOSITION
5.5.5.1	19	7	Create First Revision based on Public Input 19

Proposed Text (PI)

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)~~(3) NFPA 30

~~(5)~~(4) NFPA 30A

~~(6)~~(5) NFPA 33

~~(7)~~(6) NFPA 40

~~(8)~~(7) NFPA 45

~~(9)~~(8) NFPA 51

~~(10)~~(9) NFPA 51B

~~(11)~~(10) NFPA 52

~~(12)~~(11) NFPA 58

~~(13)~~(12) NFPA 59

~~(14)~~(13) NFPA 59A

~~(15)~~(14) *NFPA 72*

~~(16)~~(15) NFPA 75

Attachment C

	~~(17)~~(16) NFPA 76
	~~(18)~~(17) NFPA 96
	~~(19)~~(18) NFPA 99
	~~(20)~~(19) NFPA 99B
	~~(21)~~(20) NFPA *101*
	~~(22)~~(21) NFPA 102
	~~(23)~~(22) NFPA 115
	~~(24)~~(23) NFPA 120
	~~(25)~~(24) NFPA 122
	~~(26)~~(25) NFPA 130
	~~(27)~~(26) NFPA 140
	~~(28)~~(27) NFPA 150
	~~(29)~~(28) NFPA 160
	~~(30)~~(29) NFPA 232
	~~(31)~~(30) NFPA 241
	~~(32)~~(31) NFPA 301
	~~(33)~~(32) NFPA 302
	~~(34)~~(33) NFPA 303
	~~(35)~~(34) NFPA 307
	~~(36)~~(35) NFPA 326
	~~(37)~~(36) NFPA 385
	~~(38)~~(37) NFPA 400
	~~(39)~~(38) NFPA 403
	~~(40)~~(39) NFPA 407
	~~(41)~~(40) NFPA 408

	~~(42)~~(41) NFPA 409 ~~(43)~~(42) NFPA 410 ~~(44)~~(43) NFPA 418 ~~(45)~~(44) NFPA 423 ~~(46)~~(45) NFPA 484 ~~(47)~~(46) NFPA 495 ~~(48)~~(47) NFPA 498 ~~(49)~~(48) NFPA 501A ~~(50)~~(49) NFPA 502 ~~(51)~~(50) NFPA 505 ~~(52)~~(51) NFPA 655 ~~(53)~~(52) NFPA 731 ~~(54)~~(53) NFPA 801 ~~(55)~~(54) NFPA 804 ~~(56)~~(55) NFPA 805 ~~(57)~~(56) NFPA 820 ~~(58)~~(57) NFPA 909 ~~(59)~~(58) NFPA 914 ~~(60)~~(59) NFPA 1123 ~~(61)~~(60) NFPA 1125 ~~(62)~~(61) NFPA 1126 ~~(63)~~(62) NFPA 1141 ~~(64)~~(63) NFPA 1192 ~~(65)~~(64) NFPA 1194 ~~(66)~~(65) NFPA 1221

	~~(67)~~(66) NFPA 1901 ~~(68)~~(67) NFPA 1906 ~~(69)~~(68) NFPA 1925 ~~(70)~~(69) *NFPA 5000*
Committee Text (FR)	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: ~~(71)~~(1) NFPA 1 ~~(72)~~(2) NFPA 2 ~~(73) NFPA 22~~ ~~(74)~~(3) NFPA 30 ~~(75)~~(4) NFPA 30A ~~(76)~~(5) NFPA 33 ~~(77)~~(6) NFPA 40 ~~(78)~~(7) NFPA 45 ~~(79)~~(8) NFPA 51 ~~(80)~~(9) NFPA 51B ~~(81)~~(10) NFPA 52 ~~(82)~~(11) NFPA 58 ~~(83)~~(12) NFPA 59 ~~(84)~~(13) NFPA 59A ~~(85)~~(14) *NFPA 72* ~~(86)~~(15) NFPA 75 ~~(87)~~(16) NFPA 76

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Attachment C

	~~(88)~~(17) NFPA 96
	~~(89)~~(18) NFPA 99
	~~(90)~~(19) NFPA 99B
	~~(91)~~(20) NFPA *101*
	~~(92)~~(21) NFPA 102
	~~(93)~~(22) NFPA 115
	~~(94)~~(23) NFPA 120
	~~(95)~~(24) NFPA 122
	~~(96)~~(25) NFPA 130
	~~(97)~~(26) NFPA 140
	~~(98)~~(27) NFPA 150
	~~(99)~~(28) NFPA 160
	~~(100)~~(29) NFPA 232
	~~(101)~~(30) NFPA 241
	~~(102)~~(31) NFPA 301
	~~(103)~~(32) NFPA 302
	~~(104)~~(33) NFPA 303
	~~(105)~~(34) NFPA 307
	~~(106)~~(35) NFPA 326
	~~(107)~~(36) NFPA 385
	~~(108)~~(37) NFPA 400
	~~(109) NFPA 403~~
	~~(110)~~(38) NFPA 407
	~~(111)~~(39) NFPA 408
	~~(112)~~(40) NFPA 409

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Attachment C

	~~(113)~~(41) NFPA 410 ~~(114)~~(42) NFPA 418 (43) NFPA 423 ~~(115)~~(44) NFPA 460 ~~(116)~~(45) NFPA 484 ~~(117)~~(46) NFPA 495 ~~(118)~~(47) NFPA 498 ~~(119)~~(48) NFPA 501A ~~(120)~~(49) NFPA 502 ~~(121)~~(50) NFPA 505 ~~(122)~~(51) NFPA 655 ~~(123)~~(52) NFPA 731 ~~(124)~~(53) NFPA 801 ~~(125)~~(54) NFPA 804 ~~(126)~~(55) NFPA 805 ~~(127)~~(56) NFPA 820 ~~(128)~~(57) NFPA 909 ~~(129)~~(58) NFPA 914 ~~(130) NFPA 1123~~ ~~(131)~~(59) NFPA 1125 ~~(132)~~(60) NFPA 1126 ~~(133)~~(61) NFPA ~~1141~~1140 ~~(134)~~(62) NFPA 1192 ~~(135)~~(63) NFPA 1194 ~~(136)~~(64) NFPA ~~1221~~1225

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	~~(137)~~(65) NFPA ~~1901~~1900 ~~(138) NFPA 1906~~ (66) NFPA ~~1925~~1910 ~~(139)~~(67) *NFPA 5000*
Statement	NFPA 22 and NFPA 1723 do not reference NFPA 10. NFPA 1925 has been combined into NFPA 1910. NFPA 1901 and NFPA 1906 have been combined into NFPA 1900. NFPA 1401 has been combined into NFPA 1400. NFPA 1221 has been combined into NFPA 1225. NFPA 403 has been combined into NFPA 460.

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Section	PI	PAGE	DISPOSITION
5.5.5.1	19	12	Resolve

Proposed Text (PI)	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~~ ~~(7) NFPA 40~~ ~~(8)~~(6) NFPA 45 ~~(9)~~(7) NFPA 51 ~~(10) NFPA 51B~~

	~~(11)~~(8) NFPA 52 ~~(12)~~(9) NFPA 58 ~~(13)~~(10) NFPA 59 ~~(14)~~(11) NFPA 59A ~~(15)~~(12) *NFPA 72* ~~(16)~~(13) NFPA 75 ~~(17)~~(14) NFPA 76 ~~(18)~~(15) NFPA 96 ~~(19)~~(16) NFPA 99 ~~(20)~~(17) NFPA 99B ~~(21)~~(18) NFPA *101* ~~(22)~~(19) NFPA 102 ~~(23)~~(20) NFPA 115 ~~(24)~~(21) NFPA 120 ~~(25)~~(22) NFPA 122 ~~(26)~~(23) NFPA 130 ~~(27)~~(24) NFPA 140 ~~(28)~~(25) NFPA 150 ~~(29)~~(26) NFPA 160 ~~(30)~~(27) NFPA 232 ~~(31)~~(28) NFPA 241 ~~(32)~~(29) NFPA 301 ~~(33)~~(30) NFPA 302 ~~(34)~~(31) NFPA 303 ~~(35)~~(32) NFPA 307

	~~(36)~~(33) NFPA 326 ~~(37)~~(34) NFPA 385 ~~(38)~~(35) NFPA 400 ~~(39)~~(36) NFPA 403 ~~(40)~~(37) NFPA 407 ~~(41)~~(38) NFPA 408 ~~(42)~~(39) NFPA 409 ~~(43)~~(40) NFPA 410 ~~(44)~~(41) NFPA 418 ~~(45)~~(42) NFPA 423 ~~(46)~~(43) NFPA 484 ~~(47)~~(44) NFPA 495 ~~(48)~~(45) NFPA 498 ~~(49)~~(46) NFPA 501A ~~(50)~~(47) NFPA 502 ~~(51)~~(48) NFPA 505 ~~(52)~~(49) NFPA 655 ~~(53)~~(50) NFPA 731 ~~(54)~~(51) NFPA 801 ~~(55)~~(52) NFPA 804 ~~(56)~~(53) NFPA 805 ~~(57)~~(54) NFPA 820 ~~(58)~~(55) NFPA 909 ~~(59)~~(56) NFPA 914 ~~(60)~~(57) NFPA 1123

	~~(61)~~(58) NFPA 1125 ~~(62)~~(59) NFPA 1126 ~~(63)~~(60) NFPA 1141 ~~(64)~~(61) NFPA 1192 ~~(65)~~(62) NFPA 1194 ~~(66)~~(63) NFPA 1221 ~~(67)~~(64) NFPA 1901 ~~(68)~~(65) NFPA 1906 ~~(69)~~(66) NFPA 1925 ~~(70)~~(67) *NFPA 5000*
Committee Text (FR)	
Statement	NFPA 33, NFPA 40, and NFPA 51B reference NFPA 10.

Section	PI	PAGE	DISPOSITION
New A.5.5.5.2	36	34	Resolve
Proposed Text (PI)	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.		

Committee Text (FR)	
Statement	The requirements given in NFPA 10 are minimum (Reference NFPA 10, Section 1.1.1, 5.5.5.2.

Section	PI	PAGE	DISPOSITION
New after 5.5.5.1	2	1	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	NFPA 600 is not applicable to all buildings and/or occupancies. The proposed text is outside the scope of NFPA 10.		

Section	PI	PAGE	DISPOSITION
5.5.5.2	22	18	Resolve
Proposed Text (PI)	~~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.~~		
Committee Text (FR)			
Statement	The requirements given in NFPA 10 are minimum (Reference NFPA 10, Section 1.1.1). Other NFPA standards might reference the requirements of NFPA 10 in whole or in part, which is not implying conflict.		

Attachment C

Section	PI	PAGE	DISPOSITION
A.5.1	28	26	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	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. It is not considered an incipient fire. 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.		

Attachment C

Section	PI	PAGE	DISPOSITION
A.5.2	179	180	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement	See Committee Statement on Public Input 172.		

Attachment C

Section	PI	PAGE	DISPOSITION
A.5.3.2.1	139	150	Resolve
Proposed Text (PI)	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 ~~(4)~~(5) Encapsulator Agent (EA)		
Committee Text (FR)			
Statement	Portable fire extinguishers used to comply with NFPA 10 shall be listed and labeled and shall 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).		

Section	PI	PAGE	DISPOSITION
A.5.3.2.2	140	151	Resolve
Proposed Text (PI)	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.)* ~~(5)~~(6) Encapsulator Agent (EA)
Committee Text (FR)	
Statement	Portable fire extinguishers used to comply with NFPA 10 shall be listed and labeled and shall 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 standard, such as, ANSI/UL 8, CAN/ULC -S554, *Water Based Agent Fire Extinguishers* (reference NFPA 10, Section 4.1.1).

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Section	PI	PAGE	DISPOSITION
New after A.5.3.2.4	141	152	Resolve
Proposed Text (PI)	**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.		
Committee Text (FR)			
Statement	See Committee Statement on Public Input 172. NFPA 10 is an ANSI approved standard requiring portable fire extinguishers to be listed and labeled to meet or exceed the requirements of the ANSI approved standard covering the rating and fire testing of fire		

	extinguishers, as well as, the applicable ANSI approved standard covering the performance requirements (reference NFPA 10, Section 4.1.1). Consideration of a Netherlands Technical Agreement, such as NEN-NTA 8133:2021, which is not an ANSI approved standard, for inclusion in ANSI/NFPA 10 is not appropriate. With regard to NEN-NTA 8133:2021, a complete and thorough review of the NTA (Netherlands Technical Agreement) has not been conducted. However, based on the review to date, the following information is provided that was instrumental in resolving this Public Input. 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 8133:2021 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).**

Attachment C

Section	PI	PAGE	DISPOSITION
A.5.4.1.2	32	30	Hold for TC discussion (TG 2 – DISAGREEMENT)
Proposed Text (PI)	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.		
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION
A.5.4.1.3	33	31	Hold for TC discussion (TG 2 – DISAGREEMENT)
Proposed Text (PI)	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.
Committee Text (FR)	
Statement	

Section	PI	PAGE	DISPOSITION
A.5.5.4.5	30	28	Resolve

Proposed Text (PI)	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.
Committee Text (FR)	
Statement	NFPA 96:2024 indicates where and when Class K (or other) fire extinguishers are to be used.

Section	PI	PAGE	DISPOSITION
A.5.5.4.6	41	39	Resolve
Proposed Text (PI)	A.5.5.4.6 Where occupancies are required to have extinguishers installed, 5.5.4.6 is applicable to areas where the 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~~ 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.		
Committee Text (FR)			
Statement	A.5.5.4.6 provides guidance to the user regarding delicate electronic equipment.		

Attachment C

Section	PI	PAGE	DISPOSITION
A.5.5.4.6	108	122	Resolve
Proposed Text (PI)	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~~fires can occur. ~~Extinguishers provided for the protection of delicate electronic equipment are typically halogenated agent and water mist extinguishers with Class A ratings.~~		
Committee Text (FR)			
Statement	A.5.5.4.6 provides guidance to the user regarding delicate electronic equipment.		

Section	PI	PAGE	DISPOSITION
	21	17	
Proposed Text (PI)	**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.**		

Committee Text (FR)	
Statement	Reference Committee Statement on Public Input 19.

Attachment D

Section	PI	PAGE	DISPOSITION
8.1.2	79	80	Create First Revision
Proposed Text (PI)	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.		
Committee Text (FR)	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	The term requalify is contained in the CFR Title 49 and adding the term could avoid confusion.		

Section	PI	PAGE	DISPOSITION
8.3.1	93	91	Create First Revision
Proposed Text (PI)	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

Commented [DC1]: PIs 93 and 135 are on the same table so they should be reviewed together and if they are going to both be changes it should be one FR.

	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
Committee Text (FR)	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

Attachment D

	Wetting agent	5
	Foam	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	There is no need to differentiate by the different types of foam extinguishers in the Hydrostatic Test Interval for Extinguishers Table.	

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Section	PI	PAGE	DISPOSITION
8.3.1	135	147	Resolve
Proposed Text (PI)	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

Committee Text (FR)	**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

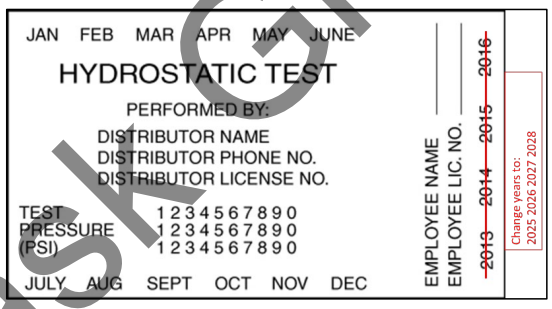
Statement	There is insufficient evidence to support water based Encapsulator Agents should be added to the standard.

Attachment D

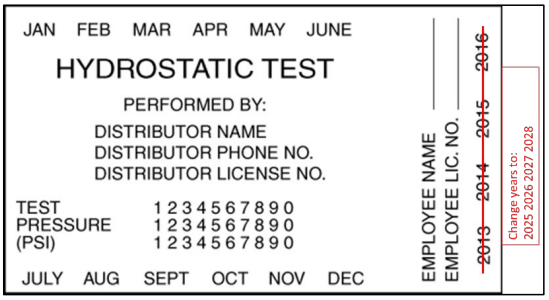
Section	PI	PAGE	DISPOSITION
8.5.1.5	55	53	Resolve
Proposed Text (PI)	8.5.1.5 All tests shall be conducted using approved test fittings and adapters		
Committee Text (FR)	8.5.1.5 All tests shall be conducted using ~~approved~~ test fittings and adapters		
Statement	It is unclear from the proposed text and substantiation who would be the approving authority		

Section	PI	PAGE	DISPOSITION
8.8.2.1	80	81	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)	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	The substantiation does not provide a technical justification on why cylinder disposition requirements associated with non specification and specification type cylinders need to be clarified.

Section	PI	PAGE	DISPOSITION
A.8.7.2	67	67	Create First Revision
Proposed Text (PI)	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. 
Committee Text (FR)	A.8.7.2

Attachment D

	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. 
Statement	The Design of the Hydrostatic Test label sketch dates are old and required updating.

Section	PI	PAGE	DISPOSITION
B.1.1	156	161	Resolve
Proposed Text (PI)	**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 section 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.		

Commented [DC2]: This is related to PI 189 and should be linked to any action on PI 189.

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	Figure B.1.1 Recommended Marking System.
Committee Text (FR)	**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 section 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.**
Statement	The proposed change was based on the creation of a Class L fire or Class L fire extinguisher which was not done.

Section	PI	PAGE	DISPOSITION
B.1.1	105	117	Resolve
Proposed Text (PI)	**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.**
Committee Text (FR)	**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.**
Statement	The substantiation does not provide data to support the propsed changes.

Section	PI	PAGE	DISPOSITION
B.1.1	189	190	Resolve
Proposed Text (PI)	See Attached “PI-189_B.1.1_Public_Input” Looking to modify the figure if Class L is added to the standard.		

Committee Text (FR)	Keep figure as currently in standard
Statement	The proposed change was based on the creation of a Class L fire or Class L fire extinguisher which was not done.

Section	PI	PAGE	DISPOSITION
B.2.2	157	164	Resolve
Proposed Text (PI)	**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. Revised – 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.**		

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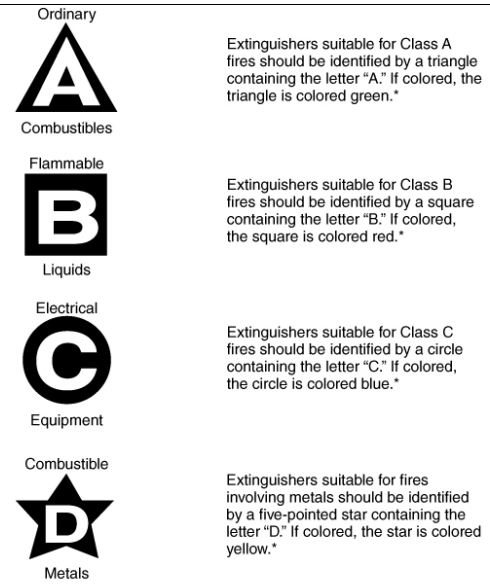
	
Committee Text (FR)	Keep figure as currently in standard
Statement	The proposed change was based on the creation of a Class L fire or Class L fire extinguisher which was not done.

Section	PI	PAGE	DISPOSITION
B.2.2	187		Resolve
Proposed Text (PI)	See Attached "PI-187_B.2.2_Public_Input" Looking to modify the figure if Class L is added to the standard.		
Committee Text (FR)	Keep figure as currently in standard		

Attachment D

Statement	The proposed change was based on the creation of a Class L fire or Class L fire extinguisher which was not done.

Section	PI	PAGE	DISPOSITION
C.2.6.3	95	93	Create First Revision

Proposed Text (PI)	C.2.6.3 Class B obstacle fire situations present some additional extinguisher agent, hardware, and application considerations. ~~AFFF and FFFP foam~~ 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.
Committee Text (FR)	C.2.6.3 Class B obstacle fire situations present some additional extinguisher agent, hardware, and application considerations. ~~AFFF and FFFP foam~~ 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	There is no need to differentiate by the different types of foam extinguishers.

Section	PI	PAGE	DISPOSITION
C.3.3	96	94	Create First Revision
Proposed Text (PI)	C.3.3 ~~AFFF and FFFP~~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.		
Committee Text (FR)	C.3.3 ~~AFFF and FFFP~~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.		

Attachment D

Statement	There is no need to differentiate by the different types of foam extinguishers.

Section	PI	PAGE	DISPOSITION
New C.13	158	165	
Proposed Text (PI)	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.		
Committee Text (FR)	~~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	The proposed change was based on the creation of a Class L fire or Class L fire extinguisher which was not done.		

Commented [DC4]: If this moves forward I think it was supposed to be C.2.13

Section	PI	PAGE	DISPOSITION
New C.3.2.2	159	166	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)	~~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	There is not technical justification provided for the proposed change.

Section	PI	PAGE	DISPOSITION
D.1.2.2	97	95	Create First Revision

Commented [DC5]: PI 160 also addresses Table D.1.2.2 and should be reviewed together with PI 97.

Proposed Text (PI)

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

	Expelling Methods				
Extinguishing Materials	**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		
Committee Text (FR)	**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**					
		Expelling Methods				
	Extinguishing Materials	**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	There is no need to differentiate by the different types of foam extinguishers in the Expelling Methods table.					

Section	PI	PAGE	DISPOSITION
D.1.2.2	160	167	Resolve
Proposed Text (PI)	**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**		

Commented [DC6]: I couldn't tell what columns should be checked off if water additives is added to the standard

Attachment D

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		x	x		
Water Additive					
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		

Committee Text (FR)

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

	Expelling Methods				
Extinguishing Materials	**Self-Expelling**	**Gas Cartridge or Cylinder**	**Stored Pressure**	**Mechanically Pumped**	**Hand Propelled**
Water and antifreeze			x	x	x
Wetting agent			x		
AFFF and FFFP		x	x		
~~Water~~ Additive					
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	There is not technical justification provided for the proposed change.				

Section	PI	PAGE	DISPOSITION
D.2.4.3	198	202	No recommendation by Task Group
Proposed Text (PI)	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		
Committee Text (FR)			
Statement			

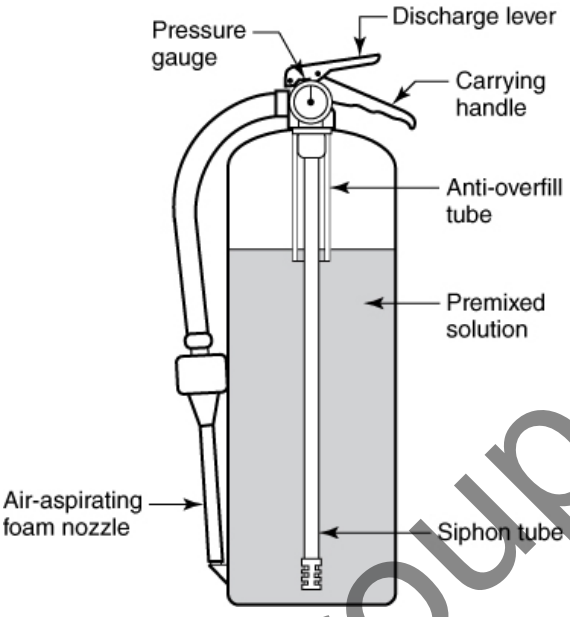
Section	PI	PAGE	DISPOSITION

Attachment D

D.4.1.5.1	161	168	Resolve
Proposed Text (PI)	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).		
Committee Text (FR)	~~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	There is insufficient evidence to support water based Encapsulator Agents should be added to the standard.		

Section	PI	PAGE	DISPOSITION
D.4.2	98	96	Create First Revision
Proposed Text (PI)	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~~ .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~~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~~Foam Liquid Extinguisher. 
Committee Text (FR)	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~~ .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.

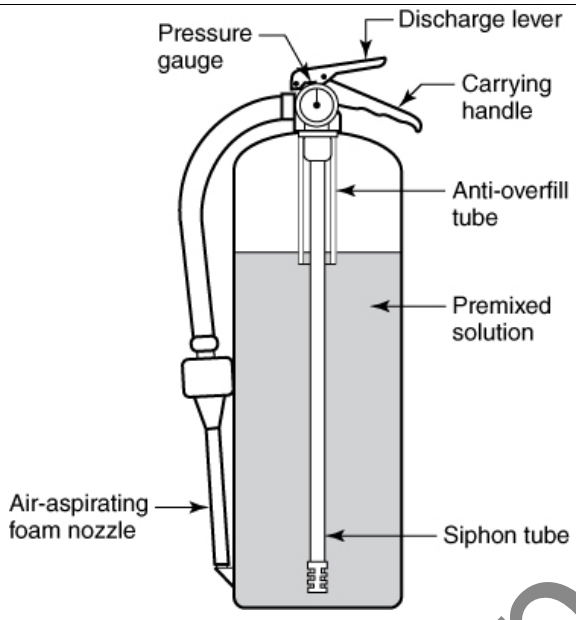
Grades of these agents are also suitable for the protection of water-soluble flammable liquids (polar solvents) such as alcohols, acetone, esters, ketones, and so forth. The suitability of these fire extinguishers for polar solvent fires should be referenced specifically on the nameplate. These agents are not suitable for use on pressurized fuel fires or cooking grease fires.

Specific information on the properties and limitations of ~~AFFF and FFFP~~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~~Foam Liquid Extinguisher.

Attachment D

	
Statement	There is no need to differentiate by the different types of foam extinguishers in the annex D fire extinguisher characteristics section.

Section	PI	PAGE	DISPOSITION
New E.8	180	181	Resolve
Proposed Text (PI)	E.8 Class L Fire Extinguisher Distribution		
Committee Text (FR)	~~E.8 Class L Fire Extinguisher Distribution~~		
Statement	The proposed change was based on the creation of a Class L fire or Class L fire extinguisher which was not done.		

Section	PI	PAGE	DISPOSITION

Attachment D

New E.8.1	181	182	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)	~~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	The proposed change was based on the creation of a Class L fire or Class L fire extinguisher which was not done.		

Section	PI	PAGE	DISPOSITION
New E.8	195	199	Resolve
Proposed Text (PI)	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.		
Committee Text (FR)	~~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.~~		

Attachment D

Statement	Placeholder not necessary as a new class of fire was not created.

Section	PI	PAGE	DISPOSITION
F.4.1	99	98	Create First Revision
Proposed Text (PI)	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~~foam, antifreeze, wetting agent 3. Carbon dioxide 4. General use residential fire extinguisher 5. Special purpose residential fire extinguisher		
Committee Text (FR)	F.4.1 The following types of fire extinguishers are recommended for installation and use in family dwellings and living units: 6. Dry chemical 7. Water, ~~AFFF, FFFP~~foam, antifreeze, wetting agent 8. Carbon dioxide 9. General use residential fire extinguisher 10. Special purpose residential fire extinguisher		
Statement	There is no need to differentiate by the different types of foam extinguishers in the Annex F Selection of residential fire extinguishing equipment.		

Commented [DC7]: PI 99 and 162 are on the same section and should be reviewed together

Attachment D

Section	PI	PAGE	DISPOSITION
F.4.1	162	169	Resolve
Proposed Text (PI)	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		
Committee Text (FR)	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	There is insufficient evidence to support water based Encapsulator Agents should be added to the standard.		

Section	PI	PAGE	DISPOSITION
F.4.2	100	99	Resolve

Attachment D

Proposed Text (PI)	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
Committee Text (FR)	F.4.2 The following types of extinguishers are considered obsolete and should be removed from service and replaced: 9. Soda acid types 10. Chemical foam (excluding film-forming agents) 11. Carbon tetrachloride, methyl bromide, and chlorobromomethane (CBM) 12. Cartridge-operated water 13. Cartridge-operated loaded stream 14. Copper or brass shell fire extinguishers (excluding pump tanks) joined by soft solder or rivets 15. Extinguishers rated prior to 1955 and marked B-1, C-1 on the nameplate

	16. Fire extinguishers not listed or labeled
Statement	Film forming agents are not considered obsolete.

Section	PI	PAGE	DISPOSITION
F.7.3.2	101	100	Create First Revision

Proposed Text (PI)

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, FFFP~~foam, 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.

<table>
<tr><td>Committee Text (FR)</td><td>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

<table>
<tr><th>Type of Extinguisher</th><th>Internal Maintenance Interval (years)</th><th>Hydrostatic Testing Interval (years)</th></tr>
<tr><td>Dry chemical*</td><td>6</td><td>12</td></tr>
<tr><td>Water, ~~AFFF, FFFP~~foam, antifreeze</td><td>5</td><td>5</td></tr>
<tr><td>Halogenated agent†</td><td>6</td><td>12</td></tr>
<tr><td>Carbon dioxide</td><td>5</td><td>5</td></tr>
</table>
*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.</td></tr>
<tr><td>Statement</td><td>There is no need to differentiate by the different types of foam extinguishers in the Frequency of internal maintenance and hydrostatic testing Table</td></tr>
</table>

Section	PI	PAGE	DISPOSITION
G.1.1	186	187	Resolve

Attachment D

Proposed Text (PI)	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) ~~5.~~6. *Class L Rating, Special tests on lithium batteries (to be determined) (Reserve)*
Committee Text (FR)	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: ~~6.~~7. *Class A Rating.* Wood ~~7.~~8. *Class B Rating.* Two in. (51 mm) depth heptane fires in square pans ~~8.~~9. *Class C Rating.* No fire test; special tests required to ensure the safety of the extinguisher operator ~~9.~~10. *Class D Rating.* Special tests on specific combustible metal fires

	~~10.~~11. *Class K Rating.* Special tests on cooking appliances using combustible cooking media (vegetable or animal oils and fats)
Statement	The proposed change was based on the creation of a Class L fire or Class L fire extinguisher which was not done.

Section	PI	PAGE	DISPOSITION
H.2	102	101	Create First Revision
Proposed Text (PI)	See Attached Word File "PI-102_H_2"		
Committee Text (FR)	As indicated in attached word file.		
Statement	There is no need to differentiate by the different types of foam extinguishers in the Annex H Conditions of Selection - Characteristics of extinguishers Table and proceeding text.		

Section	PI	PAGE	DISPOSITION
I.1	103	107	Create First Revision
Proposed Text (PI)	No proposed changes were submitted. The statement says "Update necessary changes to properly address the use of environmentally acceptable Synthetic Fluorine Free Foam (SFFF) agent types." I have included a Word Document "PI-103_I_1" that can be used if it is decided changes should be made.		
Committee Text (FR)	**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	There is no need to differentiate by the different types of foam extinguishers in the Annex I Maintenance Procedures - Agent and expelling means maintenance checklist Table.

Section	PI	PAGE	DISPOSITION
New I.1.3	57	53	Resolve
Proposed Text (PI)	I.1.3 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.		
Committee Text (FR)			
Statement	There is no proposed text included in the submission		

Attachment D

Section	PI	PAGE	DISPOSITION
Annex K	203, 204, 205	207, 208, 209	Resolve
Proposed Text (PI)	See attached Word Document "10-2022_K_Reference_Update"		
Committee Text (FR)			
Statement	This submission is addressed via a global Public Input		

Commented [DC8]: All the references for Annex K will need to be reviewed and confirmed that they are correct. I have also included several comments.

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION

Attachment D

Proposed Text (PI)			
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
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Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
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Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			

Attachment D

Committee Text (FR)	
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Section	PI	PAGE	DISPOSITION
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Proposed Text (PI)			
Committee Text (FR)			
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Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
Statement			

Attachment D

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
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Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
Statement			

Attachment D

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
Statement			

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Proposed Text (PI)			
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION

Attachment D

Proposed Text (PI)	
Committee Text (FR)	
Statement	

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			

Attachment D

Committee Text (FR)	
Statement	

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
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Proposed Text (PI)			
Committee Text (FR)			
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Proposed Text (PI)			
Committee Text (FR)			
Statement			

Attachment D

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Proposed Text (PI)			
Committee Text (FR)			
Statement			

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Proposed Text (PI)			
Committee Text (FR)			
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Proposed Text (PI)			
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION

Attachment D

Proposed Text (PI)	
Committee Text (FR)	
Statement	

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
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Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			
Statement			

Section	PI	PAGE	DISPOSITION
Proposed Text (PI)			
Committee Text (FR)			

Attachment D

Statement	

Section	PI	PAGE	DISPOSITION
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Committee Text (FR)			
Statement			

INTRODUCING NEW CATEGORY L: ELEVATING LITHIUM BATTERY PROTECTION

A		Ordinary Combustibles	Wood, Paper, Cloth, Etc.
B		Flammable Liquids	Grease, Oil, Paint, Solvents
C		Live Electrical Equipment	Electrical Panel, Motor, Wiring, Etc.
D		Combustible Metal	Magnesium, Aluminum, Etc.
K		Commercial Cooking Equipment	Cooking Oils, Animal Fats, Vegetable Oils
L		Lithium-Ion Equipment Energised	Lithium-Ion Batteries

Introduction

Jesse Corletto, Founder, EfireX

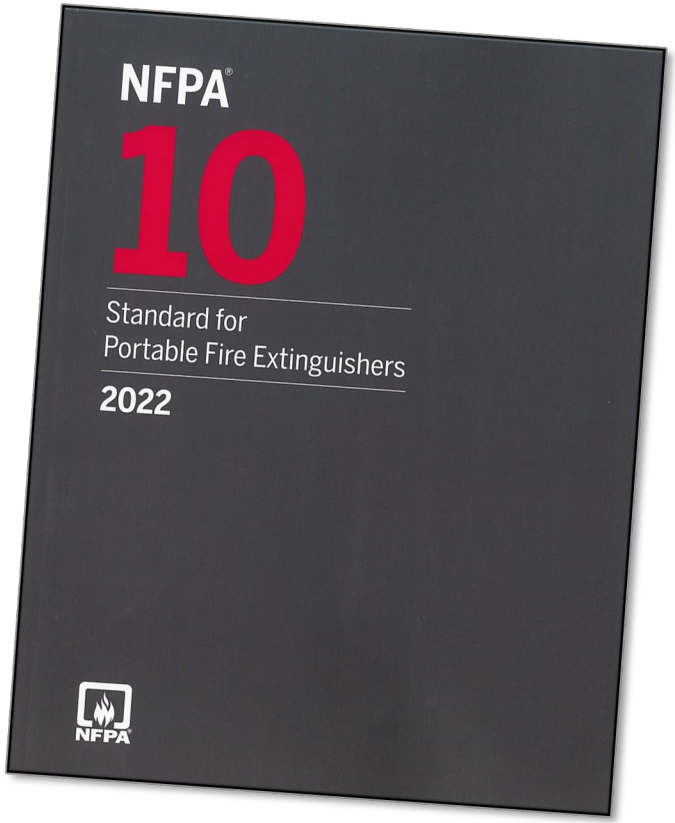
- Retired firefighter with over 25 years of combined fire suppression and protection experience
- Holding a Fire Science and Business Management degrees from the University of Nevada, Reno and Truckee Meadows Community College
- Introduced language to NFPA 18A for Encapsulator Agents

Carl Baldassarra, Senior Principal, WJE

- Over 45 years of experience in fire protection engineering
- Served on and chaired various technical committees for ICC, NFPA, SFPE, Underwriters' Laboratories, and the Chicago Building Code
- Developed fire protection solutions for virtually every type of building and structure

Objectives for 2025 NFPA 10

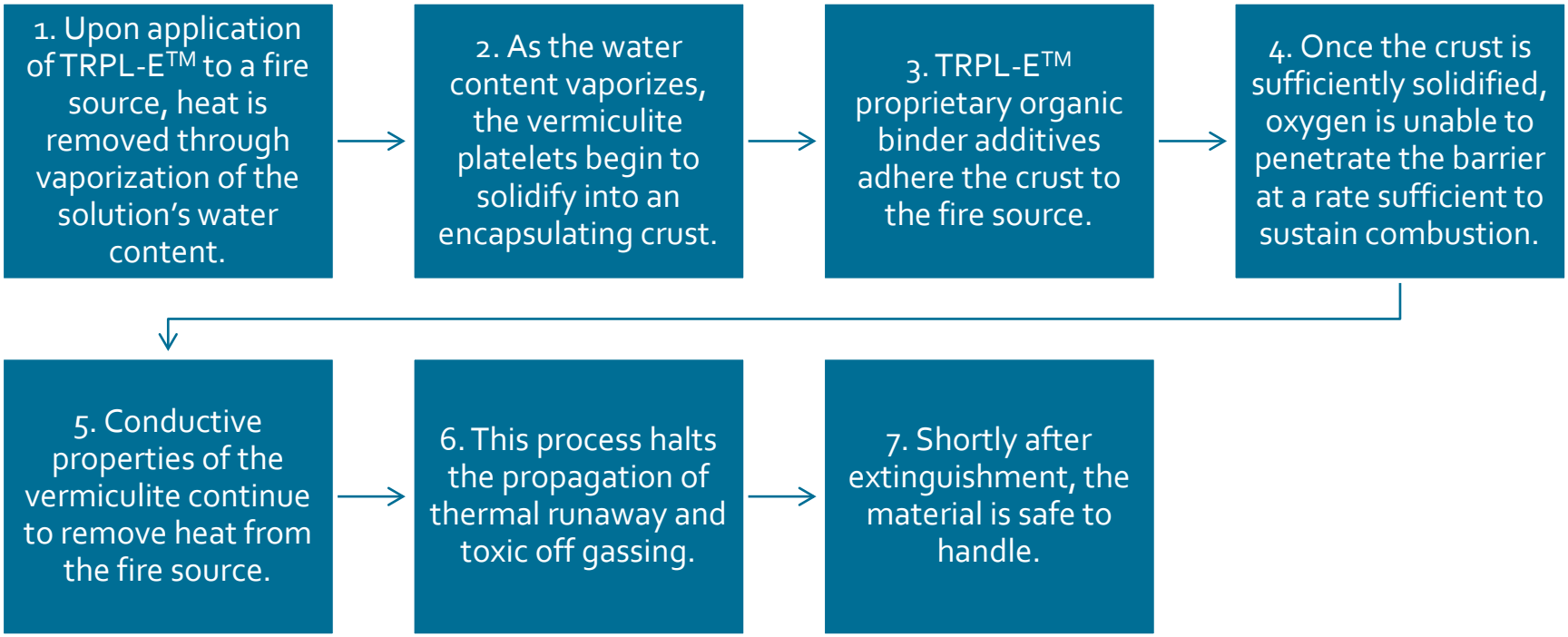
- Introduce a new fire hazard classification (Class L) for lithium-ion battery fire hazards, different from other Class A, B, C, or D hazards
- Introduce a new class of fire extinguishers (Class L) for the protection of lithium-ion battery fire hazards
- Provide direction to certification agencies for the listing of Class L extinguishing agents for the protection of lithium-ion battery fire hazards



EfireX Product Introduction

- EfireX has developed natural, mineral-based products specifically to suppress fires involving lithium-based energy storage batteries.
- Products developed by EfireX include:
  - CapLite® Powder
    - Consists of 100% organic, very high aspect ratio vermiculite platelets
    - Used to upgrade heat resistance and encapsulating properties of systems that incompatible with water
  - TRPLE-E™ Encapsulator Agent
    - Consists of a solution containing suspended CapLite® Powder particles
    - Stops the propagation of lithium-ion battery thermal runaway with its engineered encapsulator formulation

How does TRPL-E™ Work?



Upcoming Fire Testing

- EfireX is slated for extinguisher classification testing at UL next month
- Testing will initially involve classification of TRPL-E™ agent for protection of Class A and B fire hazards in accordance with UL 711

Current Acknowledgement of Li-Ion Hazards

- Fires involving lithium-ion batteries are unique and may involve multiple fire classes (Class A, B, C, D) within one entity
- Current NFPA standards do not address lithium-ion battery fires as a stand-alone hazard
- Test methods have not been developed by certification agencies for the specific protection of lithium-ion batteries
- Encapsulator agents are recognized in NFPA 18A Annex A as effective against lithium-ion battery fire hazards
- Encapsulator agents are currently unable to be listed for use as an extinguishing agent


Lithium-Ion Batteries Hazard and Use Assessment

Final Report

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Need for Li-Ion Hazard Acknowledgement

- The use of lithium-ion battery technology is steadily increasing for uses including:
  - Energy storage systems (ESS)
  - Electric vehicles (EV)
  - Other battery powered modes of transportation (bicycles, scooters, etc.)
- However, the fire protection strategy for these hazards remains largely undefined or is based on suppression through the application of high volumes of water for extended periods of time

Summary of EfireX PIs for NFPA 10

- Introduction of a new fire hazard class specific to lithium-ion batteries and battery powered equipment (Class L)
- Introduction of a new class of fire extinguishers and fire extinguishing agents for the protection of defined lithium-ion battery fire hazard class (Class L)
- Introduction of language on encapsulator fire suppression agents
- Reserved sections for the future incorporation of standard test methods related to the listing of extinguishers for the protection of lithium-ion battery fires, and for the installation of such extinguishers

Benefits of Suggested PIs

- Product certification agencies often follow the lead of national code and standard organizations such as NFPA
- Introducing a new fire hazard class specific to lithium-ion batteries will:
  - Acknowledge the unique fire hazard presented by lithium-ion battery technology
  - Provide a starting point for the development of a more complete fire safety strategy for the protection of lithium-ion related fire hazards
  - Create a need for the development of standard fire test methods for the listing of fire extinguishers and fire extinguishing agents for use on lithium-ion fire hazards

Discussion & Questions