NFPA CORRELATING COMMITTEE ON
FIRE AND EMERGENCY SERVICES PROTECTIVE CLOTHING AND EQUIPMENT

AGENDA

MAY 14-15, 2015
HARTFORD, CT

1. 9:00 AM - Call to Order - Chair Bill Haskell
2. Members and guests self-introductions
3. Chair Remarks – Bill Haskell
4. Approval of the CC Minutes of the November 6, 2014 web conference (Attachment 1)
5. NFPA Staff Liaison Report – Chris Farrell, Correlating Committee actions on Second Draft Reports
6. Fire Protection Research Foundation Update – Casey Grant
7. NFPA 1977, Standard on Protective Clothing and Equipment for Wildland Fire Fighting (Second Draft Final Ballot Results of the Technical Committee - attached) Rick Swan
10. Non-encapsulating 1991 and additional chemical exposure testing of SCBA beyond CWA
11. Overview of the NFPA 1802 hand-held radio communications device standard and correlation with NFPA 1981 SCBA and 1982 PASS standards – Bob Athanas
12. Wireless communications - use of trade names in standards – Bob Athanas
13. Future Project Organization TG – Rick Swan
14. Ensemble Certification – Dan Rossos
15. Chapter 4 Certification issues/standardization across the project documents
16. ATF Research Presentation on Attack Hose Testing and Heat/Flame Exposure Environment (Adam St. John & Lisa Herb – Friday, May 15 at 9:00 a.m.)
17. Certification and labeling to multiple NFPA standards – Jeff Stull
18. TC Chair Reports
   TC on ELS – R. Athanas
   TC on EMS – T. Hock
   TC on HAZ – C. Baxter
   TC on RPE – D. Rossos
   TC on SCE – J. Metz
   TC on SPF – S. King
   TC on TTO – B. Montgomery
   TC on WFF – R. Swan
19. Old Business
Interactions between Professional Qualification (PQU-AAC), Fire Service Training (FIY-AAA),
Fire Service Occupational Safety and Health (FIX-AAA) and
Fire and Emergency Services Protective Clothing and Equipment (FAE-AAC)

20. New Business

NFPA CORRELATING COMMITTEE ON
FIRE AND EMERGENCY SERVICES PROTECTIVE CLOTHING AND EQUIPMENT

MINUTES

NOVEMBER 6, 2014
WEB CONFERENCE
1:00 p.m. ET

Members in Attendance (A- alternate; NV – Non-voting)

Bill Haskell, CC Chair  NIOSH/NPPTL
Jason Allen  Intertek
James Brinkley  IAFF
Cristine Fargo  ISEA
Robert Freese  Globe
Kim Henry  PBI Performance Products
Thomas Hosea  U.S. Dept. of the Navy
James Johnson  Lawrence Livermore National Laboratory
Karen Lehtonen  Lion Apparel
David Mathews  ISO
Michael McKenna  Michael McKenna & Associates
Jeff Stull  International Personnel Protection, Inc.
Tim Tomlinson  Addison (TX) FD
Robert Tutterow  FIERO
William Van Lent  FEMSA
Anthony Petrilli (A)  USDA
Tricia Hock (NV)  SEI
Jeremy Metz (NV)  West Metro (CO) Fire Rescue
Brian Montgomery (NV)  U.S. DOJ
Dan Rossos (NV)  OR Dept. of Public Safety Stds and Training
Rick Swan (NV)  IAFF
Dave Trebisacci  NFPA Staff Liaison

Guests in Attendance

John Drewniaik  PBI Performance Products
Diane Hess  UL
Andy Kaiser  UL
James Murray  FDNY
Beverly Stutts  UL
Jian Xiang  duPont
Chris Farrell  NFPA
Ken Willette  NFPA
The meeting was called to order at 1:00 p.m. by Chairman Bill Haskell.

The CC Minutes of the June 24-25, 2014 Bloomington meeting were approved. Motion by Cristine Fargo, second by Tim Tomlinson, motion passed unanimously.

The NFPA staff liaison report was provided by Dave Trebisacci. Dave outlined the procedures for the CC to provide Second Correlating Revisions to NFPA 1953.

The CC provided 3 Second Correlating Revisions (SCRs) to NFPA 1953, Standard on Protective Ensembles for Contaminated Water Diving (see the Second Draft Report for NFPA 1953).

Brief TC Chair Reports were provided by the following:
- TC on EMS – T. Hock
- TC on RPE – D. Rossos
- TC on SCE – J. Metz
- TC on TTO – B. Montgomery
- TC on WFF – R. Swan

There was no old business conducted.

Under new business, the CC discussed the development of informational products for fire fighters related to structural fire fighting protective clothing and equipment protection and limitations.

The CC discussed responder PPE for protection from biological hazards such as Ebola, and the implications for standards including NFPA 1999. Jeff Stull provided an overview of a possible TIA to NFPA 1999.

Dave Mathews discussed the IFREACT project.

Upcoming meetings were tentatively scheduled for:

The conference call was adjourned at 3:00 p.m. ET on November 6, 2014. Motion by Dave Mathews, second by Bill Van Lent, motion passed unanimously.
MEMORANDUM

To: NFPA Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment
From: Yvonne Smith, Project Administrator
Date: February 26, 2015
Subject: NFPA1977 Second Draft TC FINAL Ballot Results (F2015)

According to the final ballot results, all ballot items received the necessary affirmative votes to pass ballot.

22 Members Eligible to Vote
2 Not Returned (Ackerman, Wood)
18 Affirmative on All Revisions
1 Affirmative with Comment on one or more Revisions (Diaz)
2 Negative on one or more Revisions (Ellison, Johnson)
0 Abstentions on one or more Revisions

The attached report shows the number of affirmative, negative, and abstaining votes as well as the explanation of the vote for each second revision.

There are two criteria necessary for each second revision to pass ballot: (1) simple majority and (2) affirmative 2/3 vote. The mock examples below show how the calculations are determined.

(1) Example for Simple Majority: Assuming there are 20 vote eligible committee members, 11 affirmative votes are required to pass ballot. (Sample calculation: 20 members eligible to vote ÷ 2 = 10 + 1 = 11)

(2) Example for Affirmative 2/3: Assuming there are 20 vote eligible committee members and 1 member did not return their ballot and 2 members abstained, the number of affirmative votes required would be 12. (Sample calculation: 20 members eligible to vote – 1 not returned – 2 abstentions = 17 x 0.66 = 11.22 = 12)

As always please feel free to contact me if you have any questions.
Second Revision No. 28-NFPA 1977-2014 [ Section No. 2.3.3 ]

2.3.3 ANSI/ISEA Publications.
ANSI/ISEA Z87.1, Occupational and Educational Personal Eye and Face Protection Devices, 2010.

Submitter Information Verification
Submitter Full Name: [ Not Specified ]
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submital Date: Wed Dec 17 12:50:57 EST 2014

Committee Statement
Committee Statement: The Technical Committee is updating an ANSI/ISEA standard edition date.
Response Message:

Ballot Results
This item has passed ballot
22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
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<th>Johnson, R. J.</th>
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<td>Kavalesky, Pamela A.</td>
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<td>Teter, David L.</td>
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<td>Weise, Richard</td>
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2.3.4 ASTM Publications.
ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, www.astm.org.


Submitter Information Verification

Submitter Full Name: [ Not Specified ]
Committee Statement

Committee Statement: The TC is updating the references in Chapter 2.

Response Message:
Public Comment No. 1-NFPA 1977-2014 [Section No. 2.3.4]

Ballot Results

✅ This item has passed ballot

22 Eligible Voters
2 Not Returned
19 Affirmative All
   1 Affirmative with Comments
   0 Negative with Comments
   0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard

Affirmative with Comment
Diaz, Vincent

Public comment # 2 and # 19 which were discussed and agreed with were not revised editorially to meet the
necessary requirements to be included. Voter proposes that Section 8.9.1 be revised during the next cycle to read as follows: ASTM Test Method D 7138 shall be used to determine that the minimum temperature at which melting occurs for sewing threads used in the construction of garments, helmets, gloves, footwear, face/neck shrouds, goggles, chainsaw protectors, and load carrying equipment is 260 degrees C +3 degrees/-0 degrees C (500 degrees F +5/5 degrees F). This will allow the remainder of Section 8.9 to be deleted from the text of the standard. Following the change in wording the change noted in Section 2.3.4, ASTM publications can be made.


Commercial Item Description, A-A-55217B, Thread Aramid, Spun Staple, or Type I Normal Performance, Type II High Performance, 29 March 2011.


Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 12:40:37 EST 2014

Committee Statement

Committee Statement: The Technical Committee is adding documents to the references in Chapter 2 that are included elsewhere in the standard.

Response Message:

Public Comment No. 20-NFPA 1977-2014 [Section No. 2.3.8]

Ballot Results

This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

**Affirmative All**
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
Second Revision No. 47-NFPA 1977-2015 [Section No. 3.2.7]

3.2.7 Standard.

A document, An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the Manual of Style for NFPA Technical Committee Documents. NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 12 10:33:45 EST 2015

Committee Statement

Committee Statement: Updating the definition of "standard."
Response Message:

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
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4.5.4*
Any entity that meets the definition of manufacturer as specified in Section 3.3, and therefore is considered to be the "manufacturer," but does not manufacture or assemble the compliant product, shall meet the requirements specified in Section 4.5.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 28 12:59:15 EST 2015

Committee Statement

Committee Statement: Change indicates correct reference to the definition of "manufacturer."
Response Message:

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
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Second Revision No. 58-NFPA 1977-2015 [ Section No. 5.3.2.6 ]

5.3.2.6
The protective work glove manufacturer shall make available to prospective purchasers and the purchaser a chart illustrating the hand dimension ranges specified in 6.3.5 6.3.4.4.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 28 13:06:41 EST 2015

Committee Statement

Committee Statement: Change now references the correct paragraph.
Response Message:

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Section No. 5.6.1.9

In addition to the goggles product label, each goggles lens shall bear the following:

1. The manufacturer's identifying mark or symbol
2. The certification organization's label, symbol, or identifying mark
3. The statement "NFPA 1977, 2014 Ed." in letters at least 2 mm (1/16 in.) high

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 12 10:45:40 EST 2015

Committee Statement

Committee Statement: Updating to new edition.
Response Message:

Ballot Results

- This item has passed ballot
- 22 Eligible Voters
- 0 Not Returned
- 20 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
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5.8.2.6
The manufacturer shall make available to prospective purchasers and the purchaser a chart illustrating
the hand dimension ranges specified in 6.3.5 and 6.8.4.4.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address: City:
State: Zip:
Submittal Date: Wed Jan 28 13:11:41 EST 2015

Committee Statement

Committee Statement: This change now references the correct paragraph.
Response Message:

Ballot Results

✔ This item has passed ballot
22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
Second Revision No. 1-NFPA 1977-2014 [Section No. 6.3.3.3]

6.3.3.3
Where present, the portion of the glove that extends from 25 mm (1 in.) beyond the wrist crease up to the end of the entire glove shall be considered the glove interface component and shall meet the glove interface component requirements in Section 7.4 7.3.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Dec 16 14:37:47 EST 2014

Committee Statement

Committee Statement: Incorrect reference. Correct reference is 7.3.
Response Message:
Public Comment No. 23-NFPA 1977-2014 [Section No. 6.3.3.3]

Ballot Results

This item has passed ballot
22 Eligible Voters
2 Not Returned
20 Affirmative All
 0 Affirmative with Comments
 0 Negative with Comments
 0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
| Kushen, Kirk S. |
| Laton, Michael A. |
| Moore, Jr., David A. |
| Mousseau, Marc |
| Petrilli, Anthony |
| Rihn, John F. |
| Shiels, Brian P. |
| Swan, Rick L. |
| Teter, David L. |
| Weise, Richard |
6.3.5.1.2  
Finger circumference shall be measured at the proximal interphalangeal joint (first knuckle).

6.3.5.1.3  
Finger length shall be measured from the tip of the finger to the base of the finger crease on the palm side.

6.3.5.1.4  
Hand length shall be measured by placing the subject’s hand, palm down, on a piece of paper with the fingers together and the hand and arm in a straight line.

6.3.5.1.4.1  
The thumb shall be fully abducted, extended away from the palm as far as possible.

6.3.5.1.4.2  
The paper shall be marked at the tip of the third, or middle, finger. A pencil mark shall be placed in the notch at the base of the thumb where the thumb joins the wrist.

6.3.5.1.4.3  
The straight line distance between the two points shall be measured to the nearest 3 mm (\( \frac{1}{8} \) in.) as shown in Figure 6.3.5.1.
<table>
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<th>Wood, Gary C.</th>
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<td><strong>Affirmative All</strong></td>
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<td>Brown, Richard</td>
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6.4.3
The heel breast shall not be less than 13 mm (1/2 in.). To determine heel breast height, the boot shall be placed on a flat surface and the heel breast shall be measured from where the heel breast intersects with the sole to where the heel breast intersects with the flat surface. The heel breasting angle shall not be less than 90 degrees nor more than 135 degrees relative to the sole, as shown in Figure 6.4.3.

Figure 6.4.3 Footwear Terms.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submittal Date: Tue Dec 16 15:02:41 EST 2014

Committee Statement

Committee Statement: Revises Figure 6.4.3 to be consistent with terminology. Please see editorial note for specific changes to Figure 6.4.3.

Response Message:

Public Comment No. 25-NFPA 1977-2014 [Section No. 6.4.3]
Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
Second Revision No. 4-NFPA 1977-2014 [Section No. 6.4.7.3]

6.4.7.3
Full and half sizes in each of the three required widths shall be accomplished by individual and unique lasts to provide proper fit. Dual sizing of the same pair of boots to cover men's and women's boot styles shall be acceptable and, therefore, separate lasts for men's sizes and women's sizes are not required.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Dec 16 15:06:40 EST 2014

Committee Statement

Committee Statement: Original Public Input No. PI74 which attempted to clarify that dual-sizing would not be permitted was rejected by the TC. This comment would clarify that unique lasts are not required for men's vs. women's footwear.

Response Message:
Public Comment No. 26-NFPA 1977-2014 [Section No. 6.4.7.3]

Ballot Results

This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
6.5.4.1 The shroud shall be donned properly on the helmet in the position in which it is intended to be worn, as specified by the manufacturer, on a compliant wildland fire fighting helmet as identified in 5.5.1.8(5) 5.5.2.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address: City:
State:
Zip:
Submittal Date: Wed Jan 28 13:15:24 EST 2015

Committee Statement

Committee Statement: Change now references the correct paragraph.
Response Message:

Ballot Results

✓ This item has passed ballot
22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
6.6.2
Goggle items shall meet the respective requirements for goggles and be marked “Z87+” in accordance with ANSI/ISEA Z87.1, *Occupational and Educational Personal Eye and Face Protection Devices*.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Dec 16 15:08:39 EST 2014

Committee Statement

Committee Statement: Correct designation is Z87+ as specified in PI66 for high impact protection. See editorial note to add a “*” sign following Z87. System would not permit this addition.

Response Message:
Public Comment No. 27-NFPA 1977-2014 [Section No. 6.6.2]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
| Johnson, R. J. |
| Kavalesky, Pamela A. |
| Kushen, Kirk S. |
| Laton, Michael A. |
| Moore, Jr., David A. |
| Mousseau, Marc |
| Petrilli, Anthony |
| Rihn, John F. |
| Shiels, Brian P. |
| Swan, Rick L. |
| Teter, David L. |
| Weise, Richard |
7.1.2.1 Small specimens such as labels, hanger loops, emblems, and patches that are not large enough to meet the specimen size requirements in 8.3.2.1 shall be tested for resistance to flame as specified in Section 8.3, shall not be totally consumed, shall not have an afterflame of more than 2 seconds average, and shall not melt or drip.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 28 13:16:56 EST 2015

Committee Statement

Committee Statement: Change now references the correct paragraph.
Response Message:

Ballot Results

This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
<table>
<thead>
<tr>
<th>Kushen, Kirk S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laton, Michael A.</td>
</tr>
<tr>
<td>Moore, Jr., David A.</td>
</tr>
<tr>
<td>Mousseau, Marc</td>
</tr>
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<td>Petrilli, Anthony</td>
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<td>Rihn, John F.</td>
</tr>
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<td>Shiels, Brian P.</td>
</tr>
<tr>
<td>Swan, Rick L.</td>
</tr>
<tr>
<td>Teter, David L.</td>
</tr>
<tr>
<td>Weise, Richard</td>
</tr>
</tbody>
</table>
Where the total surface area of all reinforcements exceeds the values in Table 7.1.6.1, the reinforcement composites shall be tested for evaporative heat transfer as specified in Section 8.5, and shall have a total heat loss of not less than 450 W/m². All pockets (with the exception of the front waist pockets as indicated in A.7.1.6.1) shall be included in the calculation of the surface area of reinforcement.

### Table 7.1.6.1 Total Surface Area of All Reinforcements

<table>
<thead>
<tr>
<th>Type of Garment</th>
<th>Garment Size</th>
<th>Surface Area (in.²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective upper torso garment</td>
<td>XS</td>
<td>625</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>687</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>752</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>820</td>
</tr>
<tr>
<td></td>
<td>XL</td>
<td>893</td>
</tr>
<tr>
<td></td>
<td>2XL</td>
<td>966</td>
</tr>
<tr>
<td>Men's lower torso protective garment</td>
<td>26</td>
<td>534</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>556</td>
</tr>
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<tr>
<td></td>
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<td>643</td>
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<tr>
<td></td>
<td>38</td>
<td>665</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>688</td>
</tr>
<tr>
<td>Women's lower torso protective garment</td>
<td>23</td>
<td>534</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>556</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>577</td>
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<td>599</td>
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<td>33</td>
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<td>35</td>
<td>665</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>688</td>
</tr>
<tr>
<td>Protective one-piece garment</td>
<td>XS</td>
<td>1070</td>
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<tr>
<td></td>
<td>S</td>
<td>1166</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>1264</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>1365</td>
</tr>
<tr>
<td></td>
<td>XL</td>
<td>1470</td>
</tr>
<tr>
<td></td>
<td>2XL</td>
<td>1580</td>
</tr>
</tbody>
</table>

Note: To convert measurements to mm², multiply by 645.16.
Committee Statement

Committee Statement: Incorporates Formal Interpretation No. 1977-11-1.

Response Message:

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
Second Revision No. 20-NFPA 1977-2014 [ Section No. 7.1.10 ]

7.1.10
All sewing thread utilized in the construction of garments shall be tested for resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char. Tex size as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a Tex size 21 to Tex size 100.

7.1.11
Garment product labels shall be tested for legibility as specified in Section 8.31, and shall not be torn, shall remain in place, and shall be legible to the unaided eye. All sewing thread utilized in the construction of garments shall be tested for breaking strength as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a minimum breaking strength as shown in Tables I or II in A-A-55217B.

7.1.12
Fastener tape shall be tested for breaking strength as specified in A-A-55126B, Fastener Tapes, Hook and Loop, Synthetic, and shall have the breaking strength meet or exceed the breaking strength requirements specified in A-A-55126B. All sewing thread utilized in the construction of garments shall be tested for elongation as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a maximum elongation as shown in Tables I or II in A-A-55217B.

7.1.13
Fastener tape shall be tested for shear strength as specified in A-A-55126B, Fastener Tapes, Hook and Loop, Synthetic, and shall have the shear strength meet or exceed the shear strength requirements specified in A-A-55126B. All sewing thread utilized in the construction of garments shall be tested for melting temperature as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a melting temperature not lower than 260°C (500°F).

Submitter Information Verification

Submitter Full Name: [ Not Specified ]
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 09:42:17 EST 2014

Committee Statement

Committee Statement: The Technical Committee created this second revision to establish minimum standards to maintain the current quality of sewing threads that are used for the products addressed by this standard.

1. Specify the range of Tex thread size that can be used because this is the range specified in the specification

2. Add a minimum breaking strength requirement to ensure that the minimum requirements for major seams can be met

3. Verify that excessive thread elongation does not result in diminished seam and garment performance properties not evaluated by seam strength
Verify that sewing thread will not melt and result in seam failure

**Response**

**Message:**

**Ballot Results**

- **This item has passed ballot**
  - 22 Eligible Voters
  - 2 Not Returned
  - 18 Affirmative All
    - 0 Affirmative with Comments
    - 2 Negative with Comments
    - 0 Abstention

**Not Returned**
- Ackerman, Mark Y.
- Wood, Gary C.

**Affirmative All**
- Brown, Richard
- Corrado, Steven D.
- Diaz, Vincent
- Fanning, David P.
- Haskell, III, William E.
- Hock, Tricia L.
- Hunter, Grant
- Kavalesky, Pamela A.
- Kushen, Kirk S.
- Laton, Michael A.
- Moore, Jr., David A.
- Mousseau, Marc
- Pettrili, Anthony
- Rihrn, John F.
- Shiels, Brian P.
- Swan, Rick L.
- Teter, David L.
- Weise, Richard

**Negative with Comment**
- Ellison, Andrew D.

This is an unnecessary addition to the standard which adds redundant certification testing. The function of sewing thread is to hold the fabrics together and prevent breaking apart. The hazard associated with seams in garments is break-open. NFPA 1977 already has a seam-strength performance requirement (See section 8.8 "Seam Breaking Strength Test") to evaluate the performance of the seam (sewing thread) with respect to break-open. Additionally, the thread is already required to have, and is tested to confirm, a "resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char." This suggested revision simply specifies specific prescriptive requirements (which then must be tested and verified by third-party certification labs) for the sewing thread used to make the seam which industry believes is necessary to meet the performance requirements already in this standard. This addition will not enhance user safety, or mitigate a known issue with the garments designed to the current standard. Additionally, this requirement, as specified, restricts future innovation, by specifying that the thread must meet a certain tex-size and design. If a thread manufacturer were to innovate a thread type that withstands the current functional tests in the standard, but does not meet the required tex-size, it would be effectively prohibited from use.
<table>
<thead>
<tr>
<th>Johnson, R. J.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I do not feel this significant of a revision so late in the process provided proper time for public comment and vetting to ensure this does not create unintended consequences.</td>
</tr>
</tbody>
</table>
7.2.1
All sewing thread utilized in the construction of helmets, excluding that used on the crown straps, shall be tested for resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char. shall be tested for Tex size as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a Tex size 21 to Tex size 100.

7.2.1.1
All sewing thread utilized in the construction of helmets shall be tested for breaking strength as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a minimum breaking strength as shown in Tables I or II in A-A-55217B.

7.2.1.2
All sewing thread utilized in the construction of helmets shall be tested for elongation as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a maximum elongation as shown in Tables I or II in A-A-55217B.

7.2.1.3
All sewing thread utilized in the construction of helmets shall be tested for melting temperature as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a melting temperature not lower than 260°C (500°F).

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 11:08:35 EST 2014

Committee Statement

Committee Statement: The Technical Committee created this second revision to establish minimum standards to maintain the current quality of sewing threads that are used for the products addressed by this standard.

1. Specify the range of Tex thread size that can be used because this is the range specified in the specification
2. Add a minimum breaking strength requirement to ensure that the minimum requirements for major seams can be met
3. Verify that excessive thread elongation does not result in diminished seam and garment performance properties not evaluated by seam strength
4. Verify that sewing thread will not melt and result in seam failure

Response Message:

Ballot Results

✔ This item has passed ballot
Eligible Voters
- 22
- 2 Not Returned
- 18 Affirmative All
- 0 Affirmative with Comments
- 2 Negative with Comments
- 0 Abstention

Not Returned
- Ackerman, Mark Y.
- Wood, Gary C.

Affirmative All
- Brown, Richard
- Corrado, Steven D.
- Diaz, Vincent
- Fanning, David P.
- Haskell, III, William E.
- Hock, Tricia L.
- Hunter, Grant
- Kavalesky, Pamela A.
- Kushen, Kirk S.
- Laton, Michael A.
- Moore, Jr., David A.
- Mousseau, Marc
- Petrilli, Anthony
- Rihn, John F.
- Shiels, Brian P.
- Swan, Rick L.
- Teter, David L.
- Weise, Richard

Negative with Comment
- Ellison, Andrew D.

This is an unnecessary addition to the standard which adds redundant certification testing. The function of sewing thread is to hold the fabrics together and prevent breaking apart. The hazard associated with seams in garments is break-open. NFPA 1977 already has a seam-strength performance requirement (See section 8.8 "Seam Breaking Strength Test") to evaluate the performance of the seam (sewing thread) with respect to break-open. Additionally, the thread is already required to have, and is tested to confirm, a "resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char." This suggested revision simply specifies specific prescriptive requirements (which then must be tested and verified by third-party certification labs) for the sewing thread used to make the seam which industry believes is necessary to meet the performance requirements already in this standard. This addition will not enhance user safety, or mitigate a known issue with the garments designed to the current standard. Additionally, this requirement, as specified, restricts future innovation, by specifying that the thread must meet a certain tex-size and design. If a thread manufacturer were to innovate a thread type that withstands the current functional tests in the standard, but does not meet the required tex-size, it would be effectively prohibited from use.

I do not feel this significant of a revision so late in the process provided proper time for public comment and vetting to ensure this does not create unintended consequences.
Second Revision No. 22-NFPA 1977-2014 [Section No. 7.3.10]

7.3.10
All sewing thread utilized in the construction of protective work gloves shall be tested for Tex size as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a Tex size 21 to Tex size 100, resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char.

7.3.10.1
All sewing thread utilized in the construction of protective work gloves shall be tested for breaking strength as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a minimum breaking strength as shown in Tables I or II in A-A-55217B.

7.3.10.2
All sewing thread utilized in the construction of protective work gloves shall be tested for elongation as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a maximum elongation as shown in Tables I or II in A-A-55217B.

7.3.10.3
All sewing thread utilized in the construction of protective work gloves shall be tested for melting temperature as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a melting temperature not lower than 260°C (500°F).

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 11:23:15 EST 2014

Committee Statement

Committee Statement: The Technical Committee created this second revision to establish minimum standards to maintain the current quality of sewing threads that are used for the products addressed by this standard.

1. Specify the range of Tex thread size that can be used because this is the range specified in the specification

2. Add a minimum breaking strength requirement to ensure that the minimum requirements for major seams can be met

3. Verify that excessive thread elongation does not result in diminished seam and garment performance properties not evaluated by seam strength

4. Verify that sewing thread will not melt and result in seam failure

Response Message:

Public Comment No. 13-NFPA 1977-2014 [Section No. 7.3.10]
This item has passed ballot

22 Eligible Voters
2 Not Returned
18 Affirmative All
0 Affirmative with Comments
2 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard

Negative with Comment
Ellison, Andrew D.

This is an unnecessary addition to the standard which adds redundant certification testing. The function of sewing thread is to hold the fabrics together and prevent breaking apart. The hazard associated with seams in garments is break-open. NFPA 1977 already has a seam-strength performance requirement (See section 8.8 "Seam Breaking Strength Test") to evaluate the performance of the seam (sewing thread) with respect to break-open. Additionally, the thread is already required to have, and is tested to confirm, a "resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char." This suggested revision simply specifies specific prescriptive requirements (which then must be tested and verified by third-party certification labs) for the sewing thread used to make the seam which industry believes is necessary to meet the performance requirements already in this standard. This addition will not enhance user safety, or mitigate a known issue with the garments designed to the current standard. Additionally, this requirement, as specified, restricts future innovation, by specifying that the thread must meet a certain tex-size and design. If a thread manufacturer were to innovate a thread type that withstands the current functional tests in the standard, but does not meet the required tex-size, it would be effectively prohibited from use.

Johnson, R. J.
I do not feel this significant of a revision so late in the process provided proper time for public comment and vetting to ensure this does not create unintended consequences.
7.4.9 Protective footwear shall be tested for resistance to flame as specified in Section 8.14, and shall not have an afterflame greater than 2.5 seconds, shall not melt or drip, and shall not exhibit any burn-through.

Committee Statement

Committee Statement: PI 84, FR 45, and the Working Draft of Committee Meeting Output all specify an afterflame of 5 seconds. This change will be consistent with NFPA 1951 and NFPA 1971.

Ballot Results

- This item has passed ballot
- 22 Eligible Voters
- 2 Not Returned
- 20 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned
- Ackerman, Mark Y.
- Wood, Gary C.

Affirmative All
- Brown, Richard
- Corrado, Steven D.
- Diaz, Vincent
- Ellison, Andrew D.
- Fanning, David P.
- Haskell, III, William E.
- Hock, Tricia L.
- Hunter, Grant
- Johnson, R. J.
- Kavalesky, Pamela A.
7.4.11 All sewing thread utilized in the construction exterior of protective footwear shall be tested for resistance to melting as specified in Section Tex size as specified in A-A-55195, Thread, Para-Aramid, Spun, Intermediate Modulus, Type I Normal Performance or Type II High Performance, and shall have a range from Tex size 39 to Tex size 142; or, as specified in A-A-55220, Thread, Para-Aramid, Intermediate Modulus, shall have a range from Tex size 40 to Tex size 800; or, as specified in A-A-50195, Thread, Aramid, shall have a range from Tex size 40 to Tex size 450, 8.9, and shall not ignite, melt, or char.

7.4.11.1 All sewing thread exposed to the exterior of the footwear shall be tested for breaking strength as specified in A-A-55195, Thread, Para-Aramid, Spun, Intermediate Modulus, Type I Normal Performance or Type II High Performance, and shall have a minimum breaking strength as specified in Table I or II in A-A-55195 or Table I or IA in A-A-55220, Thread, Para-Aramid, Intermediate Modulus; or Table II in A-A-50195, Thread, Aramid.

7.4.11.2 All sewing thread exposed to the exterior of the footwear shall be tested for maximum elongation as specified in A-A-55195, Thread, Para-Aramid, Spun, Intermediate Modulus, Type I Normal Performance or Type II High Performance, and shall have a minimum breaking strength as specified in Table I or II in A-A-55195 or Table I or IA in A-A-55220, Thread, Para-Aramid, Intermediate Modulus; or Table II in A-A-50195, Thread, Aramid.

7.4.11.3 All sewing thread exposed to the exterior of the footwear shall be tested for melting temperature as specified in A-A-55195, Thread, Para-Aramid, Spun, Intermediate Modulus, Type I Normal Performance or Type II High Performance; A-A-55220, Thread, Para-Aramid, Intermediate Modulus; and A-A-50195, Thread, Aramid, and shall have a melting temperature not lower than 260°C (500°F).

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Dec 17 11:29:51 EST 2014

Committee Statement

The Technical Committee created this second revision to establish minimum standards to maintain the current quality of sewing threads that are used for the products addressed by this standard.

1. Specify the range of Tex thread size that can be used because this is the range specified in the specification.

2. Add a minimum breaking strength requirement to ensure that the minimum requirements for major seams can be met.

3. Verify that excessive thread elongation does not result in diminished seam and garment performance properties not evaluated by seam strength.
4. Verify that sewing thread will not melt and result in seam failure

Response
Message:
Public Comment No. 14-NFPA 1977-2014 [Section No. 7.4.11]

Ballot Results

☑ This item has passed ballot

22 Eligible Voters
2 NotReturned
18 Affirmative All
0 Affirmative with Comments
2 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard

Negative with Comment
Ellison, Andrew D.

This is an unnecessary addition to the standard which adds redundant certification testing. The function of sewing thread is to hold the fabrics together and prevent breaking apart. The hazard associated with seams in garments is break-open. NFPA 1977 already has a seam-strength performance requirement (See section 8.8 "Seam Breaking Strength Test") to evaluate the performance of the seam (sewing thread) with respect to break-open. Additionally, the thread is already required to have, and is tested to confirm, a "resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char." This suggested revision simply specifies specific prescriptive requirements (which then must be tested and verified by third-party certification labs) for the sewing thread used to make the seam which industry believes is necessary to meet the performance requirements already in this standard. This addition will not enhance user safety, or mitigate a known issue with the garments designed to the current standard. Additionally, this requirement, as specified, restricts future innovation, by specifying that the thread must meet a certain tex-size and design. If a thread manufacturer were to innovate a thread type that withstands the current functional tests in the standard, but does not meet the required tex-size, it would be
I do not feel this significant of a revision so late in the process provided proper time for public comment and vetting to ensure this does not create unintended consequences.
Second Revision No. 24-NFPA 1977-2014 [Section No. 7.5.9]

7.5.9
All sewing thread utilized in the construction of protective face/neck shrouds shall be tested for Tex size as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a Tex size 21 to Tex size 100. Resilience to melting as specified in Section 8.9, and shall not ignite, melt, or char.

7.5.9.1
All sewing thread utilized in the construction of protective face/neck shrouds shall be tested for breaking strength as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a minimum breaking strength as shown in Tables I or II in A-A-55217B.

7.5.9.2
All sewing thread utilized in the construction of protective face/neck shrouds shall be tested for elongation as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a maximum elongation as shown in Tables I or II in A-A-55217B.

7.5.9.3
All sewing thread utilized in the construction of protective face/neck shrouds shall be tested for melting temperature as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a melting temperature not lower than 260°C (500°F).

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submittal Date: Wed Dec 17 12:15:53 EST 2014

Committee Statement

Committee Statement: The Technical Committee created this second revision to establish minimum standards to maintain the current quality of sewing threads that are used for the products addressed by this standard.

1. Specify the range of Tex thread size that can be used because this is the range specified in the specification

2. Add a minimum breaking strength requirement to ensure that the minimum requirements for major seams can be met

3. Verify that excessive thread elongation does not result in diminished seam and garment performance properties not evaluated by seam strength

4. Verify that sewing thread will not melt and result in seam failure

Response Message:
Public Comment No. 16-NFPA 1977-2014 [Section No. 7.5.9]

Ballot Results
This item has passed ballot

22 Eligible Voters
2 Not Returned
18 Affirmative All
0 Affirmative with Comments
2 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard

Negative with Comment
Ellison, Andrew D.

This is an unnecessary addition to the standard which adds redundant certification testing. The function of sewing thread is to hold the fabrics together and prevent breaking apart. The hazard associated with seams in garments is break-open. NFPA 1977 already has a seam-strength performance requirement (See section 8.8 "Seam Breaking Strength Test") to evaluate the performance of the seam (sewing thread) with respect to break-open. Additionally, the thread is already required to have, and is tested to confirm, a "resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char." This suggested revision simply specifies specific prescriptive requirements (which then must be tested and verified by third-party certification labs) for the sewing thread used to make the seams which industry believes is necessary to meet the performance requirements already in this standard. This addition will not enhance user safety, or mitigate a known issue with the garments designed to the current standard. Additionally, this requirement, as specified, restricts future innovation, by specifying that the thread must meet a certain tex-size and design. If a thread manufacturer were to innovate a thread type that withstands the current functional tests in the standard, but does not meet the required tex-size, it would be effectively prohibited from use.

Johnson, R. J.

I do not feel this significant of a revision so late in the process provided proper time for public comment and vetting to ensure this does not create unintended consequences.
7.6.2 All sewing thread utilized in the construction of protective goggles shall be tested for resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char. Thread size as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a Tex size 21 to Tex size 100.

7.6.2.1 All sewing thread utilized in the construction of protective goggles shall be tested for breaking strength as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a minimum breaking strength as shown in Tables I or II in A-A-55217B.

7.6.2.2 All sewing thread utilized in the construction of protective goggles shall be tested for elongation as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a maximum elongation as shown in Tables I or II in A-A-55217B.

7.6.2.3 All sewing thread utilized in the construction of protective goggles shall be tested for melting temperature as specified in A-A-55217B, Thread, Aramid, Spun Staple, Type I Normal Performance or Type II High Performance, and shall have a melting temperature not lower than 260°C (500°F).

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submittal Date: Wed Dec 17 12:22:20 EST 2014

Committee Statement

Committee Statement: The Technical Committee created this second revision to establish minimum standards to maintain the current quality of sewing threads that are used for the products addressed by this standard.

1. Specify the range of Tex thread size that can be used because this is the range specified in the specification
2. Add a minimum breaking strength requirement to ensure that the minimum requirements for major seams can be met
3. Verify that excessive thread elongation does not result in diminished seam and garment performance properties not evaluated by seam strength
4. Verify that sewing thread will not melt and result in seam failure

Response Message:

Public Comment No. 17-NFPA 1977-2014 [Section No. 7.6.2]

Ballot Results

✓ This item has passed ballot
22 Eligible Voters
2 Not Returned
18 Affirmative All
0 Affirmative with Comments
2 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard

Negative with Comment
Ellison, Andrew D.
This is an unnecessary addition to the standard which adds redundant certification testing. The function of sewing thread is to hold the fabrics together and prevent breaking apart. The hazard associated with seams in garments is break-open. NFPA 1977 already has a seam-strength performance requirement (See section 8.8 "Seam Breaking Strength Test") to evaluate the performance of the seam (sewing thread) with respect to break-open. Additionally, the thread is already required to have, and is tested to confirm, a "resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char." This suggested revision simply specifies specific prescriptive requirements (which then must be tested and verified by third-party certification labs) for the sewing thread used to make the seam which industry believes is necessary to meet the performance requirements already in this standard. This addition will not enhance user safety, or mitigate a known issue with the garments designed to the current standard. Additionally, this requirement, as specified, restricts future innovation, by specifying that the thread must meet a certain tex-size and design. If a thread manufacturer were to innovate a thread type that withstands the current functional tests in the standard, but does not meet the required tex-size, it would be effectively prohibited from use.

Johnson, R. J.
I do not feel this significant of a revision so late in the process provided proper time for public comment and vetting to ensure this does not create unintended consequences.
7.8.8
All sewing thread utilized in the construction of protective driving gloves shall be tested for resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char. Tex size as specified in A-A-55195, Thread, Para-Aramid, Spun, Intermediate Modulus, Type I Normal Performance or Type II High Performance, and shall have a range from Tex size 14 to Tex size 135.

7.8.8.1
All sewing thread utilized in the construction of protective driving gloves shall be tested for breaking strength as specified in A-A-55195, Thread, Para-Aramid, Spun, Intermediate Modulus, Type I Normal Performance or Type II High Performance, and shall have a minimum breaking strength of 2 lb.

7.8.8.2
All sewing thread utilized in the construction of protective driving gloves shall be tested for elongation as specified in A-A-55195, Thread, Para-Aramid, Spun, Intermediate Modulus, Type I Normal Performance or Type II High Performance, and shall have a maximum elongation of 6 percent.

7.8.8.3
All sewing thread utilized in the construction of protective work gloves shall be tested for melting temperature as specified in A-A-55195, Thread, Para-Aramid, Spun, Intermediate Modulus, Type I Normal Performance or Type II High Performance, and shall have a melting temperature not lower than 260°C (500°F).

Supplemental Information

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<th>File Name</th>
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<td>Not for editorial use</td>
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Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 12:28:56 EST 2014

Committee Statement

Committee Statement: The Technical Committee created this second revision to establish minimum standards to maintain the current quality of sewing threads that are used for the products addressed by this standard.

1. Specify the range of Tex thread size that can be used because this is the range specified in the specification

2. Add a minimum breaking strength requirement to ensure that the minimum requirements for major seams can be met

3. Verify that excessive thread elongation does not result in diminished seam and garment performance properties not evaluated by seam strength

4. Verify that sewing thread will not melt and result in seam failure
Response
Message:
Public Comment No. 18-NFPA 1977-2014 [Section No. 7.8.8]

Ballot Results

- This item has passed ballot
  - 22 Eligible Voters
    - 2 Not Returned
    - 18 Affirmative All
      - 0 Affirmative with Comments
      - 2 Negative with Comments
      - 0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard

Negative with Comment
Ellison, Andrew D.

This is an unnecessary addition to the standard which adds redundant certification testing. The function of sewing thread is to hold the fabrics together and prevent breaking apart. The hazard associated with seams in garments is break-open. NFPA 1977 already has a seam-strength performance requirement (See section 8.8 "Seam Breaking Strength Test") to evaluate the performance of the seam (sewing thread) with respect to break-open. Additionally, the thread is already required to have, and is tested to confirm, a "resistance to melting as specified in Section 8.9, and shall not ignite, melt, or char." This suggested revision simply specifies specific prescriptive requirements (which then must be tested and verified by third-party certification labs) for the sewing thread used to make the seam which industry believes is necessary to meet the performance requirements already in this standard. This addition will not enhance user safety, or mitigate a known issue with the garments designed to the current standard. Additionally, this requirement, as specified, restricts future innovation, by specifying that the thread must meet a certain tex-size and design. If a thread manufacturer were to innovate a thread type that withstands the current functional tests in the standard, but does not meet the required tex-size, it would be effectively prohibited from use.
Johnson, R. J.
I do not feel this significant of a revision so late in the process provided proper time for public comment and vetting to ensure this does not create unintended consequences.
8.1.2 Laundering Preconditioning for Textile Fabrics and Glove Wristlet Materials.

8.1.2.1* Fabrics specified to be laundered shall be laundered and dried for testing in accordance with the procedures specified in Machine Cycle 1, Wash Temperature V, and Drying Procedure Ai, of AATCC 135, *Dimensional Changes of Fabrics after After Home Laundering.*

8.1.2.2 A 1.8 kg ± 0.1 kg (4 lb ± 0.2 lb) load shall be used. A laundry bag shall not be used. Gloves shall be conditioned by being laundered and dried for a total of five cycles in accordance with the procedures specified in Machine Cycle 3, Wash Temperature II, and Drying Procedure Aiii of AATCC 135.

8.1.2.3 A 1.8 kg ± 0.1 kg (4 lb ± 0.2 lb) load shall be used. A laundry bag shall not be used.

8.1.2.4 Glove pouches and glove swatches shall be tumbled for 60 minutes and removed immediately at the end of the drying cycle. At the conclusion of the final drying cycle, glove pouches shall be dried on a forced-air, non–tumble drying mechanism operated at 10ºC ± 5ºC (50°F ± 41°F) above current room temperature until dry but not for less than 8 hours. Glove swatches that are not dry at the conclusion of the fifth drying cycle shall be hung until fully dry.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Dec 16 17:16:39 EST 2014

Committee Statement

Committee Statement: The TC rejected the Public Comment as it decided to return to current text and included TIA 11-1.

Response Message:

Ballot Results

This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
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<th>Ackerman, Mark Y.</th>
</tr>
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<tbody>
<tr>
<td>Wood, Gary C.</td>
</tr>
<tr>
<td></td>
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<td>Fanning, David P.</td>
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<td>Haskell, III, William E.</td>
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<td>Kavalesky, Pamela A.</td>
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<td>Swan, Rick L.</td>
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<tr>
<td>Teter, David L.</td>
</tr>
<tr>
<td>Weise, Richard</td>
</tr>
</tbody>
</table>
8.1.3 Washing and Drying Procedure for Gloves, Glove Pouches, and Glove Swatches.

8.1.3.1 A front-loading washer/extractor shall be used. The capacity shall be 16 kg (35 lb) or 22.6 kg (50 lb).

8.1.3.2 The wash cycle procedure and water levels specified in Table 8.1.3.2(a) and Table 8.1.3.2(b) shall be followed. The G force shall not exceed 100 G throughout the wash cycle.

Table 8.1.3.2(a) Wash Cycle Procedure for Gloves, Glove Pouches, and Glove Swatches.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Time (min)</th>
<th>Temperature ±3°</th>
<th>Temperature ±5°F</th>
<th>Water Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suds using AATCC detergent #1993, 1.0 g/gal water</td>
<td>10</td>
<td>49</td>
<td>120</td>
<td>Low*</td>
</tr>
<tr>
<td>Drain</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Carry-over</td>
<td>5</td>
<td>49</td>
<td>120</td>
<td>Low*</td>
</tr>
<tr>
<td>Drain</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Rinse</td>
<td>2</td>
<td>38</td>
<td>100</td>
<td>High*</td>
</tr>
<tr>
<td>Drain</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Rinse</td>
<td>2</td>
<td>38</td>
<td>100</td>
<td>High*</td>
</tr>
<tr>
<td>Drain</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Rinse</td>
<td>2</td>
<td>38</td>
<td>100</td>
<td>High*</td>
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<tr>
<td>Drain</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Extract</td>
<td>5</td>
<td>—</td>
<td>—</td>
<td>—</td>
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*See Table 8.1.3.2(b) for high and low water levels.

Table 8.1.3.2(b) Water Level for Gloves, Glove Pouches, and Glove Swatches Wash Cycle Procedure.

<table>
<thead>
<tr>
<th>Low Water Level 1 cm ((\frac{3}{8}) in.)</th>
<th>High Water Level 1 cm ((\frac{3}{8}) in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>cm</td>
<td>in.</td>
</tr>
<tr>
<td>20</td>
<td>7.9</td>
</tr>
</tbody>
</table>

8.1.3.3 Samples shall be washed and dried for a total of five cycles.

8.1.3.4 The wash load shall be at two-thirds the rated capacity of the washer and not exceeded.

8.1.3.5 Samples shall be dried using a tumble dryer with a stack temperature of 38°C to 49°C (100°F to 120°F) when measured on an empty load 20 minutes into the drying cycle.

8.1.3.6 Gloves, glove pouches, and glove swatches shall be tumbled for 60 minutes and removed immediately at the end of the drying cycle. At the conclusion of the final drying cycle, gloves and glove pouches shall be dried on a forced-air, non-tumble drying mechanism operated at 10°C ± 5°C above current room temperature until dry but not for less than 8 hours. Glove swatches that are not dry at the conclusion of the fifth drying cycle shall be hung until fully dry.

Submitter Information Verification

Submitter Full Name: [ Not Specified ]
Organization: [ Not Specified ]
Street Address: [ Not Specified ]
Committee Statement

Committee Statement: This is current text of section 8.1.3 from the 2011 edition, it should remain as written.

Response Message:

Ballot Results

✅ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
Second Revision No. 32-NFPA 1977-2014 [Section No. 8.1.8.2]

8.1.7.2
The wrist crease location shall be marked as described in 6.3.3.4 through 6.3.3.9 on each specimen around the entire glove 0/–3 mm (0/–0.25 in.). In the same manner, the water height line shall then be marked on each specimen 25 mm 0/–3 mm (1 in. 0/–0.25 in.) below (toward the fingers) the location of the wrist crease around the entire glove.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 13:58:31 EST 2014

Committee Statement

Committee Statement: Incorrect reference. Correct reference is 6.3.3.4.
Response Message:
Public Comment No. 30-NFPA 1977-2014 [Section No. 8.1.8.2]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
| Kavalesky, Pamela A. | Kushen, Kirk S. | Laton, Michael A. | Moore, Jr., David A. | Mousseau, Marc | Petrilli, Anthony | Rihn, John F. | Shiels, Brian P. | Swan, Rick L. | Teter, David L. | Weise, Richard |
8.3.2.1
Samples for conditioning shall be as specified in 8.3.9 for woven textile materials, in 8.3.11 for nonwoven textile materials, in 8.3.12 for visibility marking materials, in 8.3.13 for lettering, including transfer film, in 8.3.14 for small materials.
<table>
<thead>
<tr>
<th>Laton, Michael A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moore, Jr., David A.</td>
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<td>Mousseau, Marc</td>
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<td>Swan, Rick L.</td>
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<td>Teter, David L.</td>
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<td>Weise, Richard</td>
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</table>
8.4.1.2
Modifications to this test method for testing garment and face/neck shroud textiles shall be as specified in 8.4.9.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 28 15:27:14 EST 2015

Committee Statement

Committee Statement: Change indicates correct reference.
Response Message:

Ballot Results

✓ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Second Revision No. 64-NFPA 1977-2015 [Section No. 8.4.1.3]

8.4.1.3 Modifications to this test method for testing small specimens not meeting the size requirements of 8.4.9, 8.4.10 for face/neck shroud materials and for trim and label materials shall be as specified in 8.4.9, 8.4.10.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 28 15:31:18 EST 2015

Committee Statement

Committee Statement: Change indicates correct paragraph reference.
Response Message:

Ballot Results

This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalepsky, Pamela A.
Kushen, Kirk S.
<table>
<thead>
<tr>
<th>Laton, Michael A.</th>
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<tbody>
<tr>
<td>Moore, Jr., David A.</td>
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<td>Swan, Rick L.</td>
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<tr>
<td>Teter, David L.</td>
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<td>Weise, Richard</td>
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8.4.2 Samples.

8.4.2.1 Samples for conditioning shall be as specified in 8.4.9 for protective garments and protective face/neck shroud textiles; in 8.4.10 for other garments and protective face/neck shroud materials, trim, and label materials of protective garments; in 8.4.11 for hardware; in 8.4.12 for protective helmets; in 8.4.13 for protective gloves; in 8.4.14 for protective footwear; in 8.4.15 for load-carrying protective equipment; in 8.4.16 for protective goggles; and in 8.4.17 for chain saw protectors.

8.4.2.2 Samples shall be conditioned as specified in 8.1.1.

8.4.2.3 Each separable layer of multilayer material systems or composites shall be tested as an individual layer.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 28 15:34:51 EST 2015

Committee Statement

Committee Statement: Change indicates correct reference paragraph.
Response Message:

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Footwear specimens shall be filled with 4 mm (\(\frac{3}{16}\) in.) perforated soda-lime glass beads and any closures shall be fastened.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 28 15:41:31 EST 2015

Committee Statement

Committee Statement: Editorial - inserted space between "beads" and "and."
Response Message:

Ballot Results

 ✓ This item has passed ballot

  22 Eligible Voters
  2 Not Returned
  20 Affirmative All
  0 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
| Moore, Jr., David A.                  |
| Mousseau, Marc                       |
| Petrilli, Anthony                    |
| Rihn, John F.                        |
| Shiels, Brian P.                     |
| Swan, Rick L.                        |
| Teter, David L.                      |
| Weise, Richard                       |
8.4.14.6
The minimum dimensions for the test oven specified in 8.4.15.5 and 8.4.5.1 shall be 610 mm × 610 mm × 610 mm (24 in. × 24 in. × 24 in.).

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 28 15:40:17 EST 2015

Committee Statement

Committee Statement: Change indicates correct reference paragraph.
Response Message:

Ballot Results

✓ This item has passed ballot
22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
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</table>
Second Revision No. 34-NFPA 1977-2014 [Section No. 8.7.4.1]

8.7.4.1
Specimens shall be tested using five cycles of Machine Cycle I, Wash Temperature $\text{V IV}$, and Drying Procedure $\text{Aii}$ of AATCC 135, *Dimensional Changes of Fabrics After Home Laundering*.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 14:14:12 EST 2014

Committee Statement

Committee Statement: The TC accepted the CC Note as in Public Comment 52. Verification procedures did not substantiate a change, so the text reverted to current edition requirements in section 8.7.4.1, with the two editorial changes as shown.

Response Message:
Public Comment No. 52-NFPA 1977-2014 [Section No. 8.7.4.1]

Ballot Results

- This item has passed ballot

  - 22 Eligible Voters
  - 2 Not Returned
  - 20 Affirmative All
    - 0 Affirmative with Comments
    - 0 Negative with Comments
    - 0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
| Hunter, Grant          |
| Johnson, R. J.        |
| Kavalesky, Pamela A.  |
| Kushen, Kirk S.       |
| Laton, Michael A.     |
| Moore, Jr., David A.  |
| Mousseau, Marc        |
| Petrilli, Anthony     |
| Rihn, John F.         |
| Shiels, Brian P.      |
| Swan, Rick L.         |
| Teter, David L.       |
| Weise, Richard        |
8.8.4.4 Specimens of garment seam assemblies constructed from other than woven or knit textiles shall be prepared as specified in 8.8.2.1 8.8.2.2.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 28 15:49:32 EST 2015

Committee Statement

Committee Statement: Change indicates correct reference paragraph.
Response Message:

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
8.14.5.13
Water shall be placed in the fuel pan to a height of 13 mm (1/2 in.) The afterflame time shall be measured as the time, in seconds to the nearest 0.2 second, that the specimen continues to flame after the burner is removed from the flame, excluding laces.

8.14.5.14
Following the flame exposure, the specimen shall be removed and examined for melting, dripping, and burn-through, excluding laces.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submital Date: Wed Dec 17 14:24:59 EST 2014

Committee Statement

Committee Statement: These requirements were unintentionally omitted from the First Draft Report. See PI85 and FR74.
Response Message:
Public Comment No. 31-NFPA 1977-2014 [Section No. 8.14.5.13]

Ballot Results

☑ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
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<td>Teter, David L.</td>
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<tr>
<td>Weise, Richard</td>
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</table>
8.14.7.2
Any observed burn-through, melting, or dripping, excluding laces, shall constitute failure of the test sample.

Submitter Information Verification
Submitter Full Name: [ Not Specified ]
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Dec 17 14:25:43 EST 2014

Committee Statement
Committee Statement: Text was unintentionally omitted from the First Draft Report. See PI85 and FR74.
Response Message:
Public Comment No. 32-NFPA 1977-2014 [Section No. 8.14.7.2]

Ballot Results
This item has passed ballot
22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
8.16.4.1.1

The coefficient of retroreflection ($R_A$) shall be determined in accordance with ASTM E 810, Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting Utilizing the Coplanar Method Geometry, using the following modifications:

1. Test The test distance $= \text{shall be } 15.2 \text{ m (50 ft).}$

2. Observation The observation angle $= \text{shall be } 0.2 \text{ degree.}$

3. Entrance The entrance angle $= \text{shall be } +5.0 \text{ degree.}$

4. The receiver shall be provided with an entrance aperture of 25 mm (1 in.), $\pm 5\%$, in diameter, which is equivalent to 0.1 degree angular aperture.

5. The exit aperture of the source shall be circular and 25 mm (1 in.), $\pm 5\%$ in diameter, which corresponds to 0.1 degree angular aperture.

6. Retroreflector The retroreflector reference angle $= \text{shall be } 90 \text{ degrees.}$

7. Datum mark shall be placed as specified by the visibility marking manufacturer.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 12 12:27:21 EST 2015

Committee Statement

Committee Statement: Change was made to correct the title of the ASTM method.
Response Message:

Ballot Results

- This item has passed ballot
- 22 Eligible Voters
- 2 Not Returned
- 20 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.
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</table>
8.16.4.1.2
Portable and bench retroreflection measuring equipment shall be permitted to be used to determine $R_A$ values, provided the appropriate substitutional standard reference panels, measured in accordance with ASTM E810, Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting Utilizing the Coplanar Method, Geometry are used. In this case, the methods of Procedure B in ASTM E809, Standard Test Method for Measuring Photometric Characteristics of Retroreflectors, shall apply.

Submitter Information Verification
Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 12 12:29:30 EST 2015

Committee Statement
Committee Statement: Change was made to show the correct the title of the ASMT method.
Response Message:

Ballot Results
This item has passed ballot
22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
8.20.2.1
Samples to be conditioned shall be the wristlet material or a pouch or swatch as described in
8.1.6 8.1.68.1.6 8.1.5.

Submitter Information Verification

Submitter Full Name: [ Not Specified ]
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Dec 16 17:42:12 EST 2014

Committee Statement

Response Message:
Public Comment No. 33-NFPA 1977-2014 [Section No. 8.20.2.1]

Ballot Results

✓ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
Second Revision No. 14-NFPA 1977-2014 [ Section No. 8.20.2.3 ]

8.20.2.3
Three additional samples shall be conditioned as specified in 8.1.2
or swatch specimens or 8.1.2 for glove interface composite wristlet specimens, followed by conditioning as specified in 8.1.1.

Submitter Information Verification

Submitter Full Name: [ Not Specified ]
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Dec 16 17:43:23 EST 2014

Committee Statement

Committee Statement: The TC is reverting to current text for glove preconditioning in 8.20.2.3.
Response Message:

Ballot Results

✅ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
8.21.2.1
Samples for conditioning shall be in the form of a pouch or swatch as described in 8.1.6 8.1.5.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Dec 16 17:37:31 EST 2014

Committee Statement

Response Message:
Public Comment No. 34-NFPA 1977-2014 [Section No. 8.21.2.1]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
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</table>
Three additional samples shall be conditioned as specified in 8.1.2, followed by conditioning as specified in 8.1.1.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Dec 16 17:38:11 EST 2014

Committee Statement

Committee Statement: Corrects reference.
Response Message:

Ballot Results

☑ This item has passed ballot

- 22 Eligible Voters
- 2 Not Returned
- 20 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
8.22.1
Samples for conditioning shall be in the form of a pouch or swatch as described in 8.1.6.

Submitter Information Verification

Submitter Full Name: [ Not Specified ]
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 14:28:00 EST 2014

Committee Statement

Response Message:
Public Comment No. 35-NFPA 1977-2014 [Section No. 8.22.2.1]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
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8.22.2.3

Three additional samples shall be conditioned as specified in 8.1.2, followed by conditioning as specified in 8.1.1.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 13:34:21 EST 2014

Committee Statement

Committee Statement: The Technical Committee is correcting a reference.
Response Message:

Ballot Results

✓ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
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8.23.4.1 Specimens shall be evaluated in accordance with ASTM F1790/F1790M, Standard Test Method for Measuring Cut Resistance of Materials Used in Protective Clothing, as modified by 8.23.7 and 8.23.8.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 12 12:33:48 EST 2015

Committee Statement

Committee Statement: Change indicates correct number of ASTM method.
Response Message:

Ballot Results

☑ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
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</table>
8.23.7.1
Samples for conditioning shall be in the form of a pouch or swatch as described in 8.1.6 8.1.6 8.1.6 8.1.5.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 14:28:46 EST 2014

Committee Statement

Committee Statement: Incorrect reference. Correct reference should be 8.1.7.
Response Message:
Public Comment No. 36-NFPA 1977-2014 [Section No. 8.23.7.1]

Ballot Results

✓ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
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Fanning, David P.
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</table>
Second Revision No. 53-NFPA 1977-2015 [Section No. 8.24.4.1]

8.24.4.1
All specimens shall be tested in accordance with ASTM F 1342 F1342/F1342M, Standard Test Method for Protective Clothing Material Resistance to Puncture, Test Method A.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 12 12:35:33 EST 2015

Committee Statement

Committee Statement: Change reflects correct number of ASTM method.
Response Message:

Ballot Results

- This item has passed ballot
- 22 Eligible Voters
- 2 Not Returned
- 20 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
8.24.7.1 Samples for conditioning shall be in the form of a pouch or swatch as described in 8.1.6.

Submitter Information Verification

Submitter Full Name: [ Not Specified ]
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 14:29:22 EST 2014

Committee Statement

Response Message:
Public Comment No. 37-NFPA 1977-2014 [Section No. 8.24.7.1]

Ballot Results

This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
8.25.4 Apparatus.

Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 12 12:38:59 EST 2015

Committee Statement

Committee Statement: Change reflects correct numbering of ASTM method.
Response Message:

Ballot Results

✓ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
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<td>Weise, Richard</td>
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8.26.2.2
Sample glove pairs shall be preconditioned as specified in 8.1.18.1.1 8.1.

Submitter Information Verification

Submitter Full Name: [ Not Specified ]
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 14:35:05 EST 2014

Committee Statement

Response Message:
Public Comment No. 38-NFPA 1977-2014 [Section No. 8.26.2.2]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
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Second Revision No. 42-NFPA 1977-2014 [Section No. 8.26.3.3]

8.26.3.3
Specimen glove pairs shall be tested after wet conditioning as specified in 8.1.7.8.1.7.8.1.2.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 14:35:54 EST 2014

Committee Statement

Response Message:
Public Comment No. 39-NFPA 1977-2014 [Section No. 8.26.3.3]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
8.26.5.2
The gloves shall be conditioned by the wetting procedure specified in 8.1.7 immediately before each set of three pulls by the test subject as described in 8.26.5.4.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 14:36:15 EST 2014

Committee Statement

Committee Statement: Incorrect reference. Correct reference is 8.1.8. Added word "immediately" to clarify sequence of events.

Response Message:
Public Comment No. 40-NFPA 1977-2014 [Section No. 8.26.5.2]

Ballot Results

☑ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Second Revision No. 69-NFPA 1977-2015 [ Section No. 8.26.5.6 ]

8.26.5.6
The test subject shall repeat the pull described in 8.26.5.5 for a total of three pulls.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 28 16:06:32 EST 2015

Committee Statement

Committee Statement: Change indicates correct reference paragraph.
Response Message:

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
8.28 Footwear Conductive Heat Resistance Test.

8.28.1 Application.
This test method shall apply to protective footwear.

8.28.2 Samples.

8.28.2.1 Samples for conditioning shall be whole footwear with removable insoles in place.

8.28.2.2 Samples shall be conditioned as specified in 8.1.1.

8.28.3 Specimens.

8.28.3.1 Specimens for testing shall be the same as samples for conditioning.

8.28.3.2 Testing shall be conducted on a minimum of three specimens.

8.28.4 Apparatus.

8.28.4.1 The apparatus shall consist of an electric hotplate iron plate measuring 305 mm × 305 mm × 150 mm × 460 mm (12 in. × 12 in. × 6 in. × 18 in.) and an oven capable of maintaining heating the plate to a temperature of 500°C (932°F), a Type J or Type K thermocouples, and a meter to read the thermocouple temperatures.

8.28.5 Procedure.
The **thermocouples** shall be taped affixed to the insole surface of the specimen next to the foot directly above the ball of the foot. The thermocouple shall be taped to the surface with the electrical tape to hold it onto the insole surface, foot in the following locations, as shown in Figure 8.28.5.1:

- Directly above the center of the ball of the footwear
- Directly above the center of the heel of the footwear
- Directly above the toe-to-heel center of the arch of the footwear, at the inside junction between the upper and the sole

**Figure 8.28.5.1 Thermocouple Locations.**
8.28.5.2

The plate hotplate shall be heated to a temperature of 500°C, ±10°C (932°F, ±18°F) and shall maintain this temperature throughout the test period.
8.28.5.3
The specimen shall be filled with 4.55 kg (10 lb) of 10 mm (⅜ in.) steel balls. The weight of the steel balls shall be evenly distributed inside the boot. The specimen shall be placed on the plate in the upright position for 30 seconds, 2/−0 seconds.

8.28.5.4
The thermocouple temperature shall be recorded 30 seconds, +2/−0 seconds, after the specimen is placed on the heated hotplate metal plate.

8.28.6 Report.

8.28.6.1
The temperature at 30 seconds of exposure shall be recorded and reported for each area of the footwear insole for each specimen.

8.28.6.2
The average temperature at 30 seconds of exposure for each area of the footwear insole for all specimens shall also be calculated, recorded, and reported.

8.28.7 Interpretation.

8.28.7.1
The average temperature at 30 seconds of exposure for each area of the insole for all specimens shall be used to determine pass or fail performance.

Submitter Information Verification

Submitter Full Name: [ Not Specified ]
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 17 14:39:40 EST 2014

Committee Statement

Committee Statement: The original PI 81 was intended to make NFPA 1977 consistent with 1971. During TC discussions at the FR meeting, the TC agreed that the increased temperature and shorter exposure period was to be maintained for 1977. This was due to the hazard of stepping into a high temperature depression. Since the higher temperature and short duration were maintained, the original language should be as well. The ball of the foot has shown to be the most critical area, and there is little information to be gained by the use of additional thermocouples over a short period of time. Additionally, electric hotplates cannot be used reliably at 500C.

Response Message:
Public Comment No. 41-NFPA 1977-2014 [Section No. 8.28]

Ballot Results

✓ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Acknowledgments

Mark Y. Ackerman
Gary C. Wood

Affirmative All

Richard Brown
Steven D. Corrado
Vincent Diaz
Andrew D. Ellison
David P. Fanning
William E. Haskell, III
Tricia L. Hock
Grant Hunter
R. J. Johnson
Pamela A. Kavalesky
Kirk S. Kushen
Michael A. Laton
David A. Moore, Jr.
Marc Mousseau
Anthony Petrilli
John F. Rihn
Brian P. Shiels
Rick L. Swan
David L. Teter
Richard Weise

National Fire Protection Association Report http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
Second Revision No. 70-NFPA 1977-2015 [ Section No. 8.31.4.3.1 ]

8.31.4.3.1
Specimens shall be subjected to convective heat in accordance with the procedures specified in 8.4.4 and 8.4.5 through 8.4.5.4, with the following modifications:

1. The oven preheat specified in 8.4.5.6 shall be stabilized at 141°C, +6°/−0°C (285°F, +10°/−0°F).

2. The specimen exposure time specified in 8.4.5.4 shall begin when the test thermocouple reading recovers to 141°C, +6°/−0°C (285°F, +10°/−0°F), and the test temperature shall remain at 141°C, +6°/−0°C (285°F, +10°/−0°F) for the duration of the test.

3. After 10 minutes, ±2 minutes, the specimens shall be removed and subjected to the required testing.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 28 16:20:21 EST 2015

Committee Statement

Committee Statement: References taken out due to paragraph deletion from the standard.
Response Message:

Ballot Results

✓ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
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<td>Shiels, Brian P.</td>
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<td>Swan, Rick L.</td>
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<tr>
<td>Teter, David L.</td>
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<tr>
<td>Weise, Richard</td>
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</tbody>
</table>
8.31.8.5
For the drying cycles of the laundering durability test specified in 8.31.4.1.1, gloves shall be tumble dried for 60 minutes and shall be removed immediately at the end of the drying cycle. At the conclusion of the final drying cycle, the gloves shall be dried on a forced-air, non–tumble drying mechanism operated at 10°C, ± 5°C, above current room temperature for 8 hours, ± 45 minutes.
A.3.3.23 Goggles.
See ANSI/ISEA Standard Z87.1 for guidance on eye and face protection.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc

Committee Statement

Committee Statement: Change reflects correct title of reference.
Response Message:

Ballot Results

✓ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
Ellison, Andrew D.
Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
B.2 Informational References. (Reserved)

The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

B.2.1
ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.
www.astm.org.


Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submittal Date: Tue Dec 16 18:33:47 EST 2014

Committee Statement

Committee Statement: The TC is adding two informational references.

Response Message: 

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
2 Not Returned
20 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Ackerman, Mark Y.
Wood, Gary C.

Affirmative All
Brown, Richard
Corrado, Steven D.
Diaz, Vincent
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Fanning, David P.
Haskell, III, William E.
Hock, Tricia L.
Hunter, Grant
Johnson, R. J.
Kavalesky, Pamela A.
Kushen, Kirk S.
Laton, Michael A.
Moore, Jr., David A.
Mousseau, Marc
Petrilli, Anthony
Rihn, John F.
Shiels, Brian P.
Swan, Rick L.
Teter, David L.
Weise, Richard
MEMORANDUM

To: Technical Committee on Hazardous Materials Protective Clothing and Equipment

From: Yvonne Smith, Project Administrator

Date: April 29, 2015

Subject: NFPA 1991 Second Draft TC FINAL Ballot Results (F2015)

According to the final ballot results, all ballot items received the necessary affirmative votes to pass ballot.

- 29 Members Eligible to Vote
- 7 Not Returned (Buck, Kelly, North, Ott, Starrett, Thompson, Wisner)
- 21 Affirmative on All Revisions
- 0 Affirmative with Comment on one or more Revisions
- 1 Negative on one or more Revisions (Nystrom)
- 1 Abstentions on one or more Revisions (Nystrom)

The attached report shows the number of affirmative, negative, and abstaining votes as well as the explanation of the vote for each second revision.

There are two criteria necessary for each second revision to pass ballot: (1) simple majority and (2) affirmative \( \frac{2}{3} \) vote. The mock examples below show how the calculations are determined.

(1) Example for Simple Majority: Assuming there are 20 vote eligible committee members, 11 affirmative votes are required to pass ballot. (Sample calculation: 20 members eligible to vote ÷ 2 = 10 + 1 = 11)

(2) Example for Affirmative \( \frac{2}{3} \): Assuming there are 20 vote eligible committee members and 1 member did not return their ballot and 2 members abstained, the number of affirmative votes required would be 12. (Sample calculation: 20 members eligible to vote – 1 not returned – 2 abstentions = 17 x 0.66 = 11.22 = 12)

As always please feel free to contact me if you have any questions.
In Chapter 7, change cross-reference 8.6 to 8.27 in the following sections:

7.2.1.1
7.3.1.1
7.3.1.2
7.4.1.1
7.4.1.2
7.5.1.1
7.5.1.2

Submitter Information Verification

Submitter Full Name: Sonia Barbosa
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Mar 09 10:19:45 EDT 2015

Committee Statement

Committee Statement: The TC is providing an editorial correction to the referenced sections.
Response Message:

Ballot Results

✓ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
This standard shall not specify requirements for the respiratory protection that is necessary for proper protection with the protective ensemble. Respiratory protection for hazardous materials emergencies and CBRN terrorism incidents is a critical part of the overall protection and shall be specified and provided by the authority having jurisdiction.

### Supplemental Information

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### Submitter Information Verification

- **Submitter Full Name:** Dave Trebisacci
- **Organization:** [Not Specified]
- **Street Address:**
- **City:**
- **State:**
- **Zip:**
- **Submittal Date:** Tue Jan 20 14:11:04 EST 2015

### Committee Statement

- **Committee Statement:**
  The authority does not physically "provide" the respiratory protection.

  The Annex A.1.1.7 is relevant to the intent of the standard and should be added back in.

  The Technical Committee accepted the Public Input and is adding the appropriate Annex text.

### Response Message

**Public Comment No. 18-NFPA 1991-2014 [Section No. 1.1.6]**

### Ballot Results

- **This item has passed ballot**
- **29 Eligible Voters**
- **7 Not Returned**
- **22 Affirmative All**
- **0 Affirmative with Comments**
- **0 Negative with Comments**
- **0 Abstention**

#### Not Returned

- Buck, Ted S.
- Kelly, Bruce S.
- North, John W.
- Ott, Louis V.
- Starrett, William M.
- Thompson, Donald B.
- Wisner, Jr., John E.

#### Affirmative All

- Allen, Jason L.
- Baxter, Christina M.
- Beggs, Dale Gregory
- Clifford, Brian J.
- Corrado, Steven D.
- Daly, Jr., Richard P.
- Fithian, William A.
- Greene, Russell R.
- Haines, Todd W.
- Harkness, A. Ira
- Haskell, III, William E.
- Kienzle, Michael P.
- Lancaster, Beth C.
2.3.2 ASTM Publications.
American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Fri Jan 30 13:14:45 EST 2015

Committee Statement
Committee Statement: These changes reflect the current ASTM naming convention for titles. The TC is also adding ASTM standards that are referenced in the standard.
Response Message:

Ballot Results
✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
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2.3.6 Other Publications.


Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 11 12:46:41 EDT 2015

Committee Statement

Committee Statement: The TC is adding the Webster Dictionary reference to Chapter 2, and two additional references that are cited in the standard.

Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
3.3.40 Manufacturer.
The entity that directs and controls any of the following: compliant product design, compliant product manufacturing, or compliant product quality assurance; or also, the entity that assumes the liability for the compliant product or provides the warranty for the compliant product.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 14:24:06 EST 2015

Committee Statement
Committee Statement: As revised their could be up to 4 different entities that could qualify as the manufacturer. Go back to original definition.
The TC is providing this change for consistency across the project documents.

Response Message:
Public Comment No. 19-NFPA 1991-2014 [Section No. 3.3.40]

Ballot Results
☑ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
3.3.43 Nonencapsulating.
A type of ensemble that provides liquid splash protection, but does not provide vapor- or gastight protection or liquidtight protection and does not cover the wearer’s respiratory equipment.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 14:30:10 EST 2015

Committee Statement
Committee Statement: This SR deletes the definition of non-encapsulated. The Technical Committee decided to address non-encapsulating vapor-protective ensembles as a new Class 1 in the next edition of NFPA 944.
Response Message:

Ballot Results
✓ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
4.1.3 All certification shall be performed by a certification organization that meets at least the requirements specified in Section 4.2 and that is accredited for personal protective equipment in accordance with ISO/IEC 17065, Conformity assessment — Requirements for bodies certifying products, processes and services. The accreditation shall be issued by an accreditation body operating in accordance with ISO 17011, Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 

Committee Statement

Committee Statement: The TC is adding the correct reference titles.
Response Message:

Ballot Results

✓ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasie, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
The certification organization shall be accredited for personal protective equipment in accordance with ISO/IEC 17065, Conformity assessment — Requirements, for bodies certifying products, processes and services. The accreditation shall be issued by an accreditation body operating in accordance with ISO 17011, Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jan 22 11:09:59 EST 2015

Committee Statement

Committee Statement: The TC has created this SR to reflect the correct title.
Response Message:

Ballot Results

☑ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
4.3.2.2
The accreditation of a certification organization’s testing laboratory shall be issued by an accreditation body operating in accordance with ISO 17011, *Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies.*
4.3.3.3
The accreditation of a manufacturer’s testing laboratory shall be issued by an accreditation body operating in accordance with ISO 17011, *Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies*.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:

Committee Statement

Committee Statement: The TC is adding the correct title of the ISO standard.
Response Message:

Ballot Results

✔ This item has passed ballot

- 29 Eligible Voters
- 7 Not Returned
- 22 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
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Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
4.4.3.2 Each vapor-protective ensemble specimen shall be tested for overall performance as specified in Section 7.1 using the following sequence of tests:

1. The vapor-protective ensemble specimen shall be tested for gastight integrity in accordance with Section 8.2.
2. The vapor-protective ensemble specimen shall then be tested for liquidtight integrity as specified in Section 8.3.
3. The vapor-protective ensemble specimen shall then be tested for overall function and integrity as specified in Section 8.4.
4. The vapor-protective ensemble specimen shall then be tested for airflow capacity as specified in Section 8.5.
5. A new vapor-protective ensemble specimen shall be tested for overall inward leakage as specified in Section 8.8.
6. If certified for optional chemical flash fire protection as specified in Section 7.7, a new vapor-protective ensemble specimen shall then be tested for overall ensemble flash protection as specified in Section 8.25.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 20:41:24 EST 2015

Committee Statement

Committee Statement: The TC added an annual requirement for inward leakage validation.
Response Message:

Ballot Results

✔ This item has passed ballot
29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael

Negative with Comment

Nyström, Ulf

The test is quite costly for it to be done annually. If performed the value of testing a single specimen can be debated.
4.4.3.3
All suit, visor, glove, footwear, optional chemical flash fire protection, and optional liquefied gas protection performance requirements shall be evaluated as specified in Chapter 7 with the following modifications:

1. Chemical permeation and chemical penetration resistance testing shall be limited to the testing specified in 7.2.1, 7.3.1, 7.4.1, and 7.5.1 and shall be limited to the following chemicals:
   (a) Acrylonitrile
   (b) Carbon disulfide
   (c) Dichloromethane
   (d) Diethylamine
   (e) Methanol
   (f) Tetrahydrofuran
   Chemical permeation testing as specified in 7.6.1 shall not be required.

2. Chemical permeation resistance testing specified in 7.7.2 shall be limited to ammonia.

3. If the number of specimens is greater than two in the initial testing, a total of two specimens shall be permitted for annual testing requirements.

4. If the testing is specified for both directions of a material, a total of two specimens per material direction shall be permitted for testing requirements.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 14:45:23 EST 2015

Committee Statement

Committee Statement: The TC with this SR is matching annual recertification requirements to the new paragraphs referenced in chapter 7.
Response Message:
Public Comment No. 126-NFPA 1991-2014 (Section No. 4.4.3.3)

Ballot Results

This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
<table>
<thead>
<tr>
<th>Daly, Jr., Richard P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fithian, William A.</td>
</tr>
<tr>
<td>Greene, Russell R.</td>
</tr>
<tr>
<td>Haines, Todd W.</td>
</tr>
<tr>
<td>Harkness, A. Ira</td>
</tr>
<tr>
<td>Haskell, III, William E.</td>
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<tr>
<td>Kienzle, Michael P.</td>
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<td>Lancaster, Beth C.</td>
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<td>Lehtonen, Karen E.</td>
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<td>Lovasic, Susan L.</td>
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<td>Mann, Philip C.</td>
</tr>
<tr>
<td>Nystrom, Ulf</td>
</tr>
<tr>
<td>Rogers, Paul G.</td>
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<tr>
<td>Shelton, Robert E.</td>
</tr>
<tr>
<td>Stull, Jeffrey O.</td>
</tr>
<tr>
<td>Zeigler, James P.</td>
</tr>
<tr>
<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>
5.1.1.9 Where detachable components of a vapor-protective ensemble element, including, but not limited to, such components as outer supplemental garments, outer gloves, or outer boots, must be worn with a vapor-protective ensemble element in order for the ensemble element to be compliant with the optional requirements of this standard, at least the following statement and information shall also be printed legibly on the product label of the ensemble and the product label for each glove and footwear element. All letters shall be at least 2.5 mm (\(\frac{3}{32}\) in.) high. The appropriate term "ensemble" or "ensemble element" shall be inserted where indicated in the label text. The statement shall be followed by the detachable component(s) shall be listed following this statement by type and, identification, and how properly worn and instructions for proper wear.

"FOR COMPLIANCE WITH NFPA 1991, AND (insert 'OPTIONAL LIMITED CHEMICAL FLASH FIRE PROTECTION FOR ESCAPE ONLY IN THE EVENT OF A CHEMICAL FLASH FIRE' or 'LIQUEFIED GAS PROTECTION' or both), THE FOLLOWING COMPONENTS MUST BE WORN IN CONJUNCTION WITH THIS VAPOR-PROTECTIVE (insert the term ENSEMBLE or ENSEMBLE ELEMENT here): (List detachable components here)."

Supplemental Information

File Name       Description
NFPA_1991_SR_66.docx Word Doc - clean replacement for 5.1.1.9, SR 66

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 17:00:00 EST 2015

Committee Statement

Committee Statement: The TC is adding clarification for labeling where detachable components are utilized.
Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
5.2.4
The manufacturer shall provide at least the following instructions and information with each vapor-protective ensemble and each element:

(1) Pre-use information as follows:
   (a) Safety considerations
   (b) Limitations of use
   (c) Marking recommendations and restrictions
   (d) A statement that most performance properties of the vapor-protective ensemble or ensemble element cannot be tested by the user in the field
   (e) Closure lubricants, if applicable
   (f) Suit visor antifog agents or procedures
   (g) Recommended undergarments
   (h) Storage life and storage conditions
   (i) Warranty information

(2) Preparation for use as follows:
   (a) Sizing/adjustment
   (b) Recommended storage practices

(3) Inspection frequency and details

(4) Don/doff information as follows:
   (a) Donning and doffing procedures
   (b) Sizing and adjustment procedures

(5) Procedures for completing interfaces with detachable components, including but not limited to detachable gloves, detachable boots, and detachable overcovers

(6) Proper use consistent with NFPA 1500 and 29 CFR 1910.132

(7) Maintenance and cleaning information as follows:
   (a) Cleaning instructions and precautions with a statement advising users not to use garments that are not thoroughly cleaned and dried
   (b) Inspection details
   (c) Maintenance criteria and methods of repair, where applicable
   (d) Decontamination procedures for both chemical and biological contamination

(8) Retirement and disposal criteria and consideration

(9) Removal Instructions for removal and reinsertion of hand from gloves

(10) Removal Instructions for removal and replacement of gloves and other user-replaceable components

(11) A statement that "The closure has not been tested for permeation resistance."

5.2.4.1
The storage life shall be stated in years following the date of manufacture, and the rationale for this determination shall be provided.
Statement: available", "unlimited" are not acceptable.

The TC accepted the Public Comment and added a new paragraph to define when the storage life begins and how it should be expressed on the label.

The Technical Committee believes that end users should be aware that the current ensemble closures are not tested for permeation resistance and that some explanation for this inconsistency be provided as part of the standard (Annex item (11)).

Response Message:

Public Comment No. 146-NFPA 1991-2014 [Section No. 5.2.4]

Ballot Results

✅ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All

Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasik, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
5.2.7*
The manufacturer shall state the model(s) and cylinder(s) size of NFPA 1981–compliant open-circuit SCBA worn during certification of the garment.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 16:46:31 EST 2015

Committee Statement

Committee Statement: The TC is adding cylinder size to the requirement.
Response Message:
Public Comment No. 23-NFPA 1991-2014 [Section No. 5.2.7]

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
The technical data package shall contain all documentation required by this standard and the values obtained from the initial certification showing compliance with the requirements of Chapter 7 in the current edition of this standard using the reporting formats provided in Table 5.3.1.2(a) and Table 5.3.1.2(b). The technical data package information shall indicate “Pass” for those requirements that have no reported quantitative values and “Not applicable” for specific requirements that do not apply to the vapor-protective ensemble.

### Table 5.3.1.2(a) Format for Reporting Certification Test Data in Technical Data Package

<table>
<thead>
<tr>
<th>Ensemble or Element</th>
<th>Performance Requirement</th>
<th>Test Method</th>
<th>Requirement</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Requirements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ensemble</td>
<td>Liquidtight integrity</td>
<td>ASTM F1359 (Section 8.3)</td>
<td>No liquid penetration</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No liquid accumulation in outer gloves</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No liquid accumulation in outer boots</td>
<td></td>
</tr>
<tr>
<td>Overall ensemble function and integrity</td>
<td></td>
<td>ASTM F1154/ ASTM F1052 (Section 8.4)</td>
<td>Ending suit pressure ≥ 80 mm water gauge</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Test subject completes task</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Test subject has visual acuity of 20/35 or better through face piece lens and visor</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Time to remove and reinsert hands in gloves 5 times ≤ 2 minutes</td>
<td></td>
</tr>
<tr>
<td>Air flow capacity</td>
<td></td>
<td>Section 8.5</td>
<td>Internal suit pressure ≤ 150 mm water gauge</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ending suit pressure ≥ 80 mm water gauge</td>
<td></td>
</tr>
<tr>
<td>Overall inward leakage</td>
<td></td>
<td>Section 8.8</td>
<td>PPDF syst ≥ 488</td>
<td>Indicate lowest average value and its location</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PPDF (local) ≥ 1071</td>
<td></td>
</tr>
<tr>
<td>Exhaust valve</td>
<td>Exhaust valve mounting strength</td>
<td>Section 8.9</td>
<td>Strength &gt; 135 N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exhaust valve inward leakage</td>
<td>Section 8.24</td>
<td>Leakage rate ≤ 30 ml/min</td>
<td></td>
</tr>
<tr>
<td>External fitting</td>
<td>External fitting installation effect on integrity</td>
<td>ASTM F1052 (Section 8.2)</td>
<td>Ending suit pressure ≥ 80 mm water gauge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>External fitting pull-out strength</td>
<td>Section 8.13</td>
<td>Strength &gt; 1000 N</td>
<td></td>
</tr>
<tr>
<td>Suit material</td>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.7)</td>
<td>Afterflame time ≤ 2 seconds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Burst strength</td>
<td>ASTM D751 (Section 8.10)</td>
<td>No melting and dripping</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Puncture propagation tear resistance</td>
<td>ASTM D2582 (Section 8.11)</td>
<td>Strength &gt; 200 N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cold temperature performance</td>
<td>ASTM D747 (Section 8.12)</td>
<td>Tear resistance ≥ 49 N</td>
<td></td>
</tr>
<tr>
<td>Suit seam</td>
<td>Breaking strength</td>
<td>ASTM D751 (Section 8.22)</td>
<td>Bend moment ≤ 0.057 Nm</td>
<td></td>
</tr>
<tr>
<td>Suit closure</td>
<td>Chemical penetration resistance</td>
<td>ASTM F903 (Section 8.23)</td>
<td>No penetration of 15 liquid chemicals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breaking strength</td>
<td>ASTM D751 (Section 8.22)</td>
<td>Strength &gt; 67 N/25 mm</td>
<td></td>
</tr>
<tr>
<td>Visor material</td>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.7)</td>
<td>Afterflame time ≤ 2 seconds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Visor high-mass impact resistance</td>
<td>Section 8.29</td>
<td>No melting and dripping</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No full-thickness cracks, holes, or fractures</td>
<td></td>
</tr>
<tr>
<td>Visor seam</td>
<td>Breaking strength</td>
<td>ASTM D751 (Section 8.22)</td>
<td>Strength &gt; 67 N/25 mm</td>
<td></td>
</tr>
<tr>
<td>Glove material</td>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.7)</td>
<td>Afterflame time ≤ 2 seconds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cut resistance</td>
<td>ASTM F1790 (Section 8.15)</td>
<td>No melting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Puncture resistance</td>
<td>ASTM F1342 (Section 8.16)</td>
<td>Blade travel distance ≥ 20 mm at 150 grams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cold temperature performance</td>
<td>ASTM D747 (Section 8.12)</td>
<td>Puncture force ≥ 22 N</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Bend moment ≤ 0.057 Nm</td>
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</tr>
<tr>
<td>Ensemble or Element</td>
<td>Performance Requirement</td>
<td>Test Method</td>
<td>Requirement</td>
<td>Result</td>
</tr>
<tr>
<td>---------------------</td>
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<td>--------</td>
</tr>
<tr>
<td>Gloves</td>
<td>Dexterity</td>
<td>ASTM F2010 (Section 8.17)</td>
<td>Percent increase in bare handed control</td>
<td>&gt; 600 percent</td>
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<td>Footwear upper material</td>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.7)</td>
<td>Afterflame time ≤ 2 seconds</td>
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</tr>
<tr>
<td>Cut resistance</td>
<td>ASTM F1790 (Section 8.15)</td>
<td>Blade travel distance ≥ 20 mm at 350 grams</td>
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<td></td>
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<td>Puncture resistance</td>
<td>ASTM F1342 (Section 8.16)</td>
<td>Puncture force ≥ 36 N</td>
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<td></td>
</tr>
<tr>
<td>Footwear toes sections</td>
<td>Impact resistance</td>
<td>ASTM F2412 (Section 8.31)</td>
<td>Impact resistance ≥ 101.7 J</td>
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<tr>
<td>Compression resistance</td>
<td>ASTM F2412 (Section 8.31)</td>
<td>Compression resistance ≥ 11,121 N</td>
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<td></td>
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<tr>
<td>Footwear soles and heels</td>
<td>Abrasion resistance</td>
<td>ISO 4649 (Section 8.19)</td>
<td>Relative volume loss ≤ 250 mm ³</td>
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<tr>
<td>Slip resistance</td>
<td>ASTM F2913 (Section 8.21)</td>
<td>Coefficient ≥ 0.40</td>
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<td>Footwear puncture resistant device</td>
<td>Puncture resistance</td>
<td>ASTM F2412 (Section 8.30)</td>
<td>No puncture</td>
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<td>Footwear soles or ladder shanks</td>
<td>Bending resistance</td>
<td>Section 8.20</td>
<td>Deflection ≤ 6 mm</td>
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<td>Optional Flash Fire Requirements</td>
<td>Overall flash fire protection</td>
<td>Section 8.25</td>
<td>Afterflame time ≤ 2 seconds</td>
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<td>Garment material</td>
<td>Heat transfer performance</td>
<td>ASTM F2700 (Section 8.18)</td>
<td>HTP Rating ≥ 12 cal/cm²</td>
<td></td>
</tr>
<tr>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.7)</td>
<td>Afterflame time ≤ 2 seconds</td>
<td></td>
<td></td>
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<tr>
<td>Visor material</td>
<td>Heat transfer performance</td>
<td>ASTM F2700 (Section 8.18)</td>
<td>HTP Rating ≥ 12 cal/cm²</td>
<td></td>
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<tr>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.7)</td>
<td>Afterflame time ≤ 2 seconds</td>
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<td></td>
</tr>
<tr>
<td>Glove material</td>
<td>Heat transfer performance</td>
<td>ASTM F2700 (Section 8.18)</td>
<td>HTP Rating ≥ 12 cal/cm²</td>
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<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.7)</td>
<td>Afterflame time ≤ 2 seconds</td>
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<tr>
<td>Footwear material</td>
<td>Heat transfer performance</td>
<td>ASTM F2700 (Section 8.18)</td>
<td>HTP Rating ≥ 12 cal/cm²</td>
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<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.7)</td>
<td>Afterflame time ≤ 2 seconds</td>
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**Table 5.3.1.2(b) Format for Reporting Certification Permeation Test Data in Technical Data Package**

<table>
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<tr>
<th>Material or Seam Tested</th>
<th>Cumulative Permeation (μg/cm²) over Test Period Interval</th>
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<tr>
<td></td>
<td>Test Period Interval</td>
</tr>
<tr>
<td></td>
<td>0–15 min</td>
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<tr>
<td>Chemical/Requirement</td>
<td>≤ 2.0</td>
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<tr>
<td>Acetone</td>
<td></td>
</tr>
<tr>
<td>Acetonitrile</td>
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</tr>
<tr>
<td>Acrolein</td>
<td></td>
</tr>
<tr>
<td>Acrylonitrile</td>
<td></td>
</tr>
<tr>
<td>Anhydrous ammonia (gas)</td>
<td></td>
</tr>
<tr>
<td>1,3-Butadiene (gas)</td>
<td></td>
</tr>
<tr>
<td>Material or Seam Tested</td>
<td>Cumulative Permeation (μg/cm²) over Test Period Interval</td>
</tr>
<tr>
<td>--------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Carbon disulfide</td>
<td></td>
</tr>
<tr>
<td>Chlorine (gas)</td>
<td></td>
</tr>
<tr>
<td>Dichloromethane</td>
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<tr>
<td>Diethyl amine</td>
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<td>Dimethyl formamide</td>
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<td>Dimethyl sulfate</td>
<td></td>
</tr>
<tr>
<td>Ethyl acetate</td>
<td></td>
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<tr>
<td>Ethylene oxide (gas)</td>
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</tr>
<tr>
<td>Hexane</td>
<td></td>
</tr>
<tr>
<td>Hydrogen chloride (gas)</td>
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<tr>
<td>Methanol</td>
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<td>Nitrobenzene</td>
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<td>Sulfuric acid, 96.1% w/w</td>
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<td>Tetrachloroethylene</td>
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<td>Tetrahydrofuran</td>
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<td><strong>Chemical Warfare Agents</strong></td>
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<td>Blister Agent Requirements</td>
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<tr>
<td>Nerve Agent Requirements</td>
<td>≤ 1.33</td>
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<tr>
<td>Distilled Mustard</td>
<td>≤ 1.33</td>
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<tr>
<td>Soman</td>
<td>≤ 1.25</td>
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<tr>
<td>Optional Liquefied Gases*</td>
<td>≤ 6.0</td>
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<tr>
<td>Ammonia (liquefied)</td>
<td></td>
</tr>
<tr>
<td>Chlorine (liquefied)</td>
<td></td>
</tr>
<tr>
<td>Ethylene oxide (liquefied)</td>
<td></td>
</tr>
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</table>

*Liquefied chemical gases are only evaluated over 15-minute exposure period.

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**Supplemental Information**

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**Submitter Information Verification**

- **Submitter Full Name:** Dave Trebisacci
- **Organization:** [ Not Specified ]
- **Street Address:**
- **City:**
- **State:**
- **Zip:**
- **Submittal Date:** Tue Jan 20 16:58:06 EST 2015

**Committee Statement**

- **Committee Statement:** The TC is providing a standardized format for reporting compliance information to permit end user organizations to easily understand and compare data from different vapor-protective suit manufacturers.
- **Response Message:**

  - Public Comment No. 72-NFPA 1991-2014 [Section No. 5.3.1.2]
  - Public Comment No. 73-NFPA 1991-2014 [Section No. A.5.3.1.2]

**Ballot Results**

- ![This item has passed ballot](checkmark)
- **29 Eligible Voters**
- **7 Not Returned**
- **22 Affirmative All**
- **0 Affirmative with Comments**

---

National Fire Protection Association Report  
http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 8-NFPA 1991-2015 [Section No. 6.1.1]

6.1.1*
Vapor-protective ensembles shall be designed and configured to protect the wearer’s torso, head, arms, legs, hands, and feet, and shall completely enclose the wearer and the wearer’s respiratory equipment.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 17:10:57 EST 2015

Committee Statement

Committee Statement: With non-encapsulating ensembles, there are no assurances and significant reason to be concerned that open-circuit, SCBA cannot provide chemical barrier comparable to the requirements that are otherwise mandated for the rest of the ensemble in NFPA 1991. Since its inception, NFPA 1991, Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies, has required that all ensemble components provide protection against a battery of chemicals. Originally, this battery consisted of 21 chemicals. This battery was selected for its wide range in chemical solubility and polymer diffusion characteristics, critical factors in the chemical permeation through protective materials. The chemicals were not chosen because they represent a specific threat, although the list includes some high volume, frequently encountered, toxic chemicals. The requirements that the ensembles protect against all of these chemicals provides a high probability that the NFPA 1991 compliant ensembles would protect against a high concentration of an unknown chemical, an unknown mixture mixture or a peculiar environmental condition. In contrast, military chemical protective equipment is tested against specific chemicals and specific concentrations, based on the assumption that both the identity and concentration of the chemical hazards can be determined beforehand. Along these lines, additional chemicals barrier requirements were added to NFPA 1991, first as options, and then mandated in the 2005 edition, in response the threat of chemical terrorism. These additional chemicals consisted of chemical warfare agents and industrial chemicals recognized as potential terrorism weapons. The latter are sometime described as “dual-use” chemical agents.

The testing requirements in the NIOSH CBRN certification program only involve 2 chemicals – sulfur mustard and sarin. The sarin challenge is only vapor and at a concentration about ½ that of saturated environment. There is no liquid challenge with sarin. Mustard barrier is determined against liquid and vapor challenges. The vapor challenge is about 1/3 saturated vapor concentration and the liquid challenge consists of 43 – 20 ul droplets placed (total of 0.86 ml or 0.03 oz) around the facepiece and interfaces. There are no other chemicals used on the barrier testing of the respirator. By comparison, NFPA 1991 requires barrier testing of all ensemble components with exposure to 100% of the chemical (liquid or vapor) and complete coverage. Therefore, the testing requirements of the NIOSH CBRN certification are significantly lower than required for components of NFPA 1991 ensembles. Butyl rubber has become a common polymer for the construction of military facepieces. We do not have barrier data on the facepieces, but we do have generic data on butyl gloves. The data taken from the most recent edition of the Pocket Guide for Chemical Protective Clothing for the 26 chemicals in the proposed NFPA 1991 battery shows that butyl provides poor barrier (< 60 minutes) against 7 (Carbon Disulfide, Dichloromethane, Diethylamine, n-Hexane, Tetrachloroethylene, Tetrahydrofurana, Toluene) and marginal barrier (<4 hours) against 5 of 25 chemicals (Butadiene, Dimethyl Sulfate, Ethyl Acetate, Ethylene Oxide, Methyl Chloride). There is comparative data on the nerve agent. This is far from the high level of chemical performance mandated in NFPA 1991. Therefore if the committee choses to permit non-encapsulating garment, it is endorsing the use of respirators with unknown, but likely poorer barrier performance than mandated for the remainder of the garment.

Response Message:
Public Comment No. 135-NFPA 1991-2014 [Section No. 6.1.1]

Ballot Results

- This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
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<td>Allen, Jason L.</td>
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<td>Baxter, Christina M.</td>
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<td>Beggs, Dale Gregory</td>
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<td>Rogers, Paul G.</td>
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<td>Stull, Jeffrey O.</td>
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<td>Zeigler, James P.</td>
</tr>
<tr>
<td>Ziskin, Michael</td>
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</table>
6.1.2.1 The suit hood shall be permitted to be provided with a visor that is designed to allow the wearer to see outside the vapor-protective ensemble.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submit Date: Wed Feb 04 09:46:58 EST 2015

Committee Statement

Committee Statement: The TC decided to address non-encapsulated ensembles in a new Class 1 of the next edition of NFPA 1994.
Response Message:

Ballot Results

This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill., William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
6.1.2.2
The visor shall be permitted to be constructed of a transparent material that qualifies as a chemical-protective layer.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Feb 04 09:47:46 EST 2015

Committee Statement

Committee Statement: The TC decided to address non-encapsulated ensembles in a new Class 1 of the next edition of NFPA 1994.
Response Message:

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
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Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
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Fithian, William A.
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Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 9-NFPA 1991-2015 [Section No. 6.1.2.3]

6.1.2.3*

Vapor-protective ensembles shall only be permitted to be constructed using an outer garment designed to be worn over the suit element where such additional garments are necessary to meet the optional liquefied gas protection performance requirements specified in Section 7.6 or the optional chemical flash fire protection performance requirements specified in Section 7.7.

6.1.2.4

No detachable visor materials shall be permitted to be used to achieve base certification requirements.

Supplemental Information

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<th>Description</th>
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Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 17:13:41 EST 2015

Committee Statement

Committee Statement:
Use of detachable visor layers should not be permitted to be used to pass any of the base requirements for the visor material just as the full suit outer garment is no longer permitted.

The TC is also making editorial corrections to reference the correct sections.

Response Message:
Public Comment No. 28-NFPA 1991-2014 [Section No. 6.1.2.3]
Public Comment No. 27-NFPA 1991-2014 [Section No. A.6.1.2.3]

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
<table>
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<tr>
<td>Haskell, III, William E.</td>
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<td>Kienzie, Michael P.</td>
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<td>Lancaster, Beth C.</td>
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<tr>
<td>Zeigler, James P.</td>
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<tr>
<td>Ziskin, Michael</td>
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</table>
6.1.3 Other than outer gloves and outer boots, vapor-protective ensembles shall be designed so that all separate components are securely attached, and the ensembles are provided as a single and integrated unit.

6.1.4 Adhesive tape shall not be used to secure or to seam components of the ensemble in order to comply with the performance requirements of the standard.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 17:21:35 EST 2015

Committee Statement

Committee Statement: The purpose of this language is to clarify a long term recommendation of most committee members. Tape is not a substitute for properly designed seams and interfaces. While adhesive tape are commonly employed by hazardous materials responders, the use and application of tape to seal a garment does not achieve consistent results. Tape cannot be applied consistently to achieve a reliable seal. Pockets and voids in the tape can trap liquids and particles that can contaminate the wearer during the doffing process. Tape cannot be reliably applied during rain and snow. The use of tape should to achieve barrier should be considered only in extreme cases where a garment of correct design is not available. Tape may be considered to reinforce interfaces or attachments but not as a replacement for a properly performing seal.

Response
Message: Public Comment No. 138-NFPA 1991-2014 [Section No. 6.1.3]

Ballot Results

- This item has passed ballot
  - 29 Eligible Voters
  - 7 Not Returned
  - 22 Affirmative All
    - 0 Affirmative with Comments
    - 0 Negative with Comments
    - 0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Where encapsulating vapor protective ensembles shall be equipped with an exhaust valve(s).

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 17:33:00 EST 2015

Committee Statement

Committee Statement: The Technical Committee has decided to address requirements for non-encapsulating vapor protective ensembles as part of a new Class 1 in NFPA 1994.

Response Message:

Ballot Results

This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovacic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 70-NFPA 1991-2015 [ New Section after 6.1.9 ]

6.1.10*
Protective cover(s) constructed using the suit’s primary material shall be provided to protect the suit closure assembly from direct chemical splashes. The cover(s) shall allow access to the closure(s) for donning, doffing, and inspection.

Supplemental Information

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Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 17:48:04 EST 2015

Committee Statement

Committee Statement: The TC is including a requirement for closure covers.

   The TC is adding Annex text to provide explanatory information on suit closure assemblies.

Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
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Lovasic, Susan L.
Mann, Philip C.
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<td>Stull, Jeffrey O.</td>
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<tr>
<td>Zeigler, James P.</td>
</tr>
<tr>
<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>

**Negative with Comment**

Nystrom, Ulf

Agree with requirement in principle but not that the liquid splash protective zipper cover necessarily has to be made of the primary suit material.
Second Revision No. 11-NFPA 1991-2015 [Section No. 6.1.11 [Excluding any Sub-Sections]]

Respiratory equipment for hazardous materials emergencies and CBRN terrorism incidents is a critical part of overall protection and shall be specified and provided by the authority having jurisdiction. Only open-circuit SCBA that is certified to NFPA 1981 shall be specified to be worn with NFPA 1991–compliant ensembles.

Supplemental Information

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Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City:  
State:  
Zip:  
Submittal Date: Tue Jan 20 17:55:05 EST 2015

Committee Statement

Committee Statement: The first sentence in 6.1.11 is mandatory text related to the AHJ. NFPA 1991 is a manufacturing product standard so evaluation to this by the certification organizations is not possible. The sentence should be moved to the annex for reference material to the requirement.

The TC is adding an explanatory paragraph for the provision of respiratory protection by the authority having jurisdiction.

Response Message: Public Comment No. 85-NFPA 1991-2014 [Section No. 6.1.11 [Excluding any Sub-Sections]]

Ballot Results

✔ This item has passed ballot

- 29 Eligible Voters
- 7 Not Returned
- 22 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 0 Abstention

Not Returned

- Buck, Ted S.
- Kelly, Bruce S.
- North, John W.
- Ott, Louis V.
- Starrett, William M.
- Thompson, Donald B.
- Wisner, Jr., John E.

Affirmative All

- Allen, Jason L.
- Baxter, Christina M.
- Beggs, Dale Gregory
- Clifford, Brian J.
- Corrado, Steven D.
- Daly, Jr., Richard P.
- Fithian, William A.
- Greene, Russell R.
- Haines, Todd W.
- Harkness, A. Ira
- Haskell, III, William E.
- Kienzle, Michael P.
- Lancaster, Beth C.
- Lehtonen, Karen E.
6.1.13*
The interface of and integration of the selected respirator respiratory equipment with the protective ensemble shall not invalidate the NIOSH certification of the respective respirator respective respiratory equipment.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 18:04:00 EST 2015

Committee Statement
Committee Statement: The TC is changing the terminology from respirator to respiratory equipment for consistency with those defined in this standard.
Response Message: Public Comment No. 86-NFPA 1991-2014 [Section No. 6.1.11.1]

Ballot Results
✔ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
6.1.13 Where a nonencapsulating vapor-protective suit is used as part of the vapor-protective ensemble, the manufacturer shall specify the specific respiratory equipment to be worn for the vapor-protective ensemble to be certified.

Submitter Information Verification

Submitter Full Name: Dave Trebiacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 17:34:15 EST 2015

Committee Statement

Committee Statement: The Technical Committee has decided to address requirements for non-encapsulating vapor protective ensembles as part of a new Class 1 in NFPA 1994.

Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill., William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
6.1.14

All testing requiring the evaluation of complete vapor-protective ensembles that include non-encapsulating vapor-protective suits shall be performed with each type of respiratory equipment for which the manufacturer is certifying the vapor-protective ensemble.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 17:34:50 EST 2015

Committee Statement

Committee Statement: The Technical Committee has decided to address requirements for non-encapsulating vapor protective ensembles as part of a new Class 1 in NFPA 1994.

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasik, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
6.2.5.1
Where the glove consists of multiple layers to meet the glove element requirements, all layers shall extend to at least the suit sleeve interface connection.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 18:06:12 EST 2015

Committee Statement
Committee Statement: The TC is making this change for clarification.
Response Message: Public Comment No. 29-NFPA 1991-2014 (Section No. 6.2.5.1)

Ballot Results
This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Vapor-protective ensembles shall be tested for overall liquid integrity as specified in Section 8.3, and ensembles shall allow no liquid penetration; where outer gloves are designed to be worn in conjunction with gloves attached to the ensemble, the outer gloves shall not collect liquid; and where outer boots are designed to be worn in conjunction with garment booties, the outer boots shall not collect liquid.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jan 20 18:29:12 EST 2015

Committee Statement

Committee Statement: The TC is providing an editorial correction, the ensemble is evaluated for liquid integrity

Response Message:
Public Comment No. 61-NFPA 1991-2014 [Section No. 7.1.1]

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
7.1.2
Ensembles shall be tested for overall function and integrity as specified in Section 8.4 and shall meet the following performance criteria:

1. Ensembles shall have an ending pressure of at least 80 mm (3 5/32 in.) water gauge pressure upon completion of the functional test.
2. Ensembles shall allow the test subject to complete all tasks while wearing a head-protective device.
3. Ensembles shall permit the test subject to see through the combination of respiration and ensemble visor with a visual acuity of 20/35 or better.
4. Ensembles shall permit the test subject to remove and reinsert their hand into the glove system 5 times sequentially within a period of 2.5 minutes or less.
5. Ensembles shall permit the test subject to properly identify 3 of the 4 numbers on the NFPA 704-based placard at each of the following angles:
   a. Upwards: 36 degrees
   b. Downward: 30 degrees
   c. Right and Left: 60 degrees

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submit Date: Tue Jan 20 18:36:58 EST 2015

Committee Statement
Committee Statement: The TC accepted the Public Input, but changed the time requirement to 2.5 minutes.
The TC also added an additional requirement for ensembles overall function and integrity performance criteria.

Response Message:
Public Comment No. 44-NFPA 1991-2014 [Section No. 7.1.2]

Ballot Results
This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
7.1.8
Vapor-protective ensembles shall be tested for overall inward leakage as specified in Section 8.8, and shall have an average local physiological protective dosage factor (PPDF\textsubscript{l}) value at each PAD location for the four ensembles tested of no less than \(10^{7.1}\) and an average systemic physiological protective dosage factor (PPDF\textsubscript{s}) value for each of the four tested ensembles of no less than \(10^{4.88}\).

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submittal Date: Tue Jan 20 18:46:24 EST 2015

Committee Statement

These changes provide new MIST performance requirements for NFPA 1991 ensembles. Both the local and systemic values are based on toxicological data that represent the exposure required to cause threshold or mild effects in 1% of the exposed population instead of the 10% value currently used for NFPA 1994 Class 2 and Class 3 ensembles. The minimum local physiological protective dosage factor (PPDF\textsubscript{l}) of \(10^{7.1}\) for NFPA 1991 ensembles is based on the conditions used by NIOSH to certify the permeation performance of CBRN SCBA's to sulfur mustard. The maximum exposure value is 300 mg/m\(^3\) x 30 minutes = 9,000 mg.min/m\(^3\). This value is divided by the onset of symptoms exposure dosage (OSED) value that corresponds to an exposure that causes threshold mustard effects of blistering and ulceration in 1% of the population (EC\textsubscript{T01}). This OSED value is 8.4 mg.min/m\(^3\). The ratio of the 9,000 mg.min/m\(^3\) to the 8.4 mg.min/m\(^3\) results in the local PPDF of \(10^{7.1}\).

The systemic physiological protective dosage factor (PPDF\textsubscript{s}) of \(10^{4.88}\) for NFPA 1991 ensembles is based on the conditions used by NIOSH to certify the permeation performance of CBRN SCBA's to nerve agent GB. The maximum exposure value is 2,000 mg/m\(^3\) x 30 minutes = 60,000 mg.min/m\(^3\) (For this calculation, nerve agent GD concentration is assumed to be equivalent to nerve agent GB concentration specified in the standard). This exposure dosage is divided by the systemic onset of symptoms exposure dosage (OSED\textsubscript{s}) that corresponds to an exposure of nerve agent GD that would cause threshold effects of twitching and localized sweating for 1% of the population (EC\textsubscript{T01}). This OSED\textsubscript{s} of 123 mg.min/m\(^3\) results in the systemic PPDF of \(10^{4.88}\).

Response Message:

Public Comment No. 74-NFPA 1991-2014 [Section No. 7.1.8]

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fifithian, William A.
Greene, Russell R.
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<td>Stull, Jeffrey O.</td>
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<td>Zeigler, James P.</td>
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<td>Ziskin, Michael</td>
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**Negative with Comment**
Nystrom, Ulf

I am against the change of test method to MIST and of the substantial lowering of the PF requirement in this standard.
Suit materials and seams shall be tested for permeation resistance as specified in Section 8.6 and shall have a cumulative permeation that does not exceed 6.0 μg/cm² for the 1-hour test period and a cumulative permeation of 6.0 μg/cm² for each chemical tested that does not exceed 2.0 μg/cm² for each 15-minute interval within the 1-hour test period for each chemical tested.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 18:58:33 EST 2015

Committee Statement

Committee Statement: The TC believes that the inclusion of 15 minute cumulative assessments will alleviate the risk of "spiking" phenomena going undetected. Setting the limit at 6.0 μg/cm² will permit permeation at a much higher level than existing materials have demonstrated. Since the rational for cumulative is chemical warfare dosing, then the maximum cumulative mass permitted should match the majority of the CWAs tested in the standard. The TC believes that setting the 15 minute interval limit at 1/2 of the total permitted is reasonable.

Response Message: Public Comment No. 30-NFPA 1991-2014 [Section No. 7.2.1 [Excluding any Sub-Sections]]

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell P.
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
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<tr>
<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>

**Negative with Comment**

Nystrom, Ulf

I am against the change to cumulative permeation.
7.2.1.2 Suit materials and seams shall be tested for permeation resistance as specified in Section 8.27 and shall not exceed a cumulative permeation of $4.0 \mu g/cm^2$ for the chemical warfare agent sulfur mustard, distilled [HD or bis (2-chloroethyl) sulfide].

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 18:00:29 EST 2015

Committee Statement

Committee Statement: The TC is making this change for consistency with other chemical permeation sections.
Response Message: Public Comment No. 125-NFPA 1991-2014 [New Section after 7.2.1.1]

Ballot Results

This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Suit materials and seams shall be tested for permeation resistance as specified in Section 8.6 and shall have a cumulative permeation that does not exceed a cumulative permeation of 6.0 μg/cm² for the 1-hour test period and a cumulative permeation that does not exceed 2.0 μg/cm² for each 15-minute interval within the 1-hour test period for each additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jan 20 20:52:03 EST 2015

Committee Statement

Committee Statement: The TC is making this revision for consistency with other sections of the standard.
Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
  7 Not Returned
  21 Affirmative All
    0 Affirmative with Comments
    1 Negative with Comments
    0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wianer, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Nystrom, Ulf
I am against the change to cumulative permeation.
7.2.2 Suit materials shall be tested for resistance to flame impingement as specified in Section 8.7, and shall have an afterflame time of not greater than 2.0 seconds and shall not melt and drip.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jan 20 19:22:59 EST 2015

Committee Statement

Committee Statement: The current means for determining material melting during the flame resistance test is unclear. By relating this determination to observed dripping, clearer guidance is provided to the laboratory for interpreting the results of this test. A related revision is being provided to make changes in the test method for the interpretation of results.

Response Message:
Public Comment No. 31-NFPA 1991-2014 [Section No. 7.2.2]

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
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Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
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Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Visor materials and visor material seams shall be tested for permeation resistance as specified in Section 8.6 and shall have a cumulative permeation that does not exceed a cumulative permeation of 6.0 μg/cm² for each 1-hour test period and a cumulative permeation that does not exceed 2.0 μg/cm² for each 15-minute interval within the 1-hour test period for each chemical tested.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 19:33:03 EST 2015

Committee Statement

Committee Statement: The TC believes that the inclusion of 15 minute cumulative assessments will alleviate the risk of “spiking” phenomena going undetected. The revision to set the 60 minute limit at 6.0 μg/cm² will permit permeation at a much higher level than what the existing certified materials have actually demonstrated. Since the rationale made for cumulative is based on chemical warfare agent dose testing, then the limit for 60 minutes should match the majority of CWAs tested – 1.25 μg/cm². The TC believes that setting the 15 minute interval limit at ½ the total permitted is reasonable.

Response
Message:

Public Comment No. 92-NFPA 1991-2014 [Section No. 7.3.1 [Excluding any Sub-Sections]]

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
21 Affirmative All

0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
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<th>Shelton, Robert E.</th>
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<td>Stull, Jeffrey O.</td>
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<tr>
<td>Zeigler, James P.</td>
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<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>

**Negative with Comment**

Nystrom, Ulf

I am against the change to cumulative permeation.
7.3.1.3 Visor materials and visor material seams shall be tested for permeation resistance as specified in Section 8.6, and shall not exhibit breakthrough detection time of 1 hour or less and shall not exceed a cumulative permeation of 6.0 μg/cm² for each chemical or specific chemical mixture for which the manufacturer is certifying the ensemble. Additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble shall have a cumulative permeation that does not exceed 2.0 μg/cm² for each 15-minute interval within the 1-hour test period and a cumulative permeation that does not exceed 6.0 μg/cm² for the 1-hour test period and a cumulative permeation that does not exceed 2.0 μg/cm² for each 15-minute interval within the 1-hour test period for each additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submit Date: Tue Jan 20 19:39:08 EST 2015

Committee Statement

Committee Statement: The TC believes that the inclusion of 15 minute cumulative assessments will alleviate the risk of "spiking" phenomena going undetected. The revision to set the 60 minute limit at 6.0 μg/cm² will permit permeation at a much higher level than what the existing certified materials have actually demonstrated. Since the rationale made for cumulative is based on chemical warfare agent dose testing, then the limit for 60 minutes should match the majority of CWAs tested – 1.25 μg/cm². The TC believes that setting the 15 minute interval limit at ½ the total permitted is reasonable.

Response Message:
Public Comment No. 93-NFPA 1991-2014 [Section No. 7.3.1.3]

Ballot Results

This item has passed ballot

29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
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<td>Zeigler, James P.</td>
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<tr>
<td>Ziskin, Michael</td>
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</table>

**Negative with Comment**

Nyström, Ulf

I am against the change to cumulative permeation.
7.3.2 Visor materials shall be tested for resistance to flame impingement as specified in Section 8.7 and shall have an afterflame time of not greater than 2.0 seconds and shall not melt and drip.

Submitter Information Verification
Submitter Full Name: Dave Trebiacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 19:42:35 EST 2015

Committee Statement
Committee Statement: The current means for determining material melting during the flame resistance test is unclear. By relating this determination to observed dripping, clearer guidance is provided to the laboratory for interpreting the results of this test. A related revision is being provided to make changes in the test method for the interpretation of results.

Response Message: Public Comment No. 32-NFPA 1991-2014 [Section No. 7.3.2]

Ballot Results
This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
7.3.3
Visor materials shall be tested for bursting strength as specified in Section 8.10 high mass impact as specified in Section 8.28 and shall not have a full-thickness puncture or crack cracks, holes, or fractures.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jan 20 19:45:15 EST 2015

Committee Statement

Committee Statement: The TC believes that this test method is not appropriate for visors and is providing an alternative visor impact test.
Response Message: Public Comment No. 77-NFPA 1991-2014 [Section No. 7.3.3]

Ballot Results

☑ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Hasell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
7.3.4 Visor materials shall be tested as specified in Section 8.11, and shall not have a full-thickness puncture or crack.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submit Date: Mon Feb 09 09:47:36 EST 2015

Committee Statement

Committee Statement: See Section 8.29, Visor High-Mass Impact Resistance Test.

Response Message:

Ballot Results

☑ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
7.3.5 Visor materials shall be tested for puncture resistance as specified in Section 8.14 and shall not show evidence of a visible hole extending through all layers.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Feb 09 09:48:36 EST 2015

Committee Statement

Committee Statement: See Section 8.30, Puncture Resistance Test Two.

Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
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Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
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Kienzle, Michael P.
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Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Glove materials and glove seams shall be tested for permeation resistance as specified in Section 8.6 and shall not exceed a cumulative permeation of 6.0 μg/cm² for the 1-hour test period and a cumulative permeation that does not exceed 2.0 μg/cm² for each 15-minute interval within the 1-hour test period for each chemical tested.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 19:56:55 EST 2015

Committee Statement

Committee Statement: The TC believes that the inclusion of 15 minute cumulative assessments will alleviate the risk of "spiking" phenomena going undetected. The revision to set the 60 minute limit at 6.0 μg/cm² will permit permeation at a much higher level than what the existing certified materials have actually demonstrated. Since the rationale made for cumulative is based on chemical warfare agent dose testing, then the limit for 60 minutes should match the majority of CWAs tested – 1.25 μg/cm². The TC believes that setting the 15 minute interval limit at ½ the total permitted is reasonable.

Response Message:
Public Comment No. 94-NFPA 1991-2014 [Section No. 7.4.1 [Excluding any Sub-Sections]]

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Glove materials and glove seams shall be tested for permeation resistance as specified in Section 8.6 and shall have a cumulative permeation that does not exceed a cumulative permeation of 6.0 μg/cm² for the 1-hour test period and a cumulative permeation that does not exceed 2.0 μg/cm² for each 15-minute interval within the 1-hour test period, for each additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 19:58:15 EST 2015

Committee Statement

Committee Statement: The TC believes that the inclusion of 15 minute cumulative assessments will alleviate the risk of “spiking” phenomena going undetected. The revision to set the 60 minute limit at 6.0 μg/cm² will permit permeation at a much higher level than what the existing certified materials have actually demonstrated. Since the rationale made for cumulative is based on chemical warfare agent dose testing, then the limit for 60 minutes should match the majority of CWAs tested – 1.25 μg/cm². The TC believes that setting the 15 minute interval limit at ½ the total permitted is reasonable.

Response
Message:

Public Comment No. 95-NFPA 1991-2014 [Section No. 7.4.1.3]

Ballot Results

This item has passed ballot
29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
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<td>Ziskin, Michael</td>
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**Negative with Comment**

Nystrom, Ulf

I am against the change to cumulative permeation.
7.4.2
Glove materials shall be tested for resistance to flame impingement as specified in Section 8.7 and shall have an afterflame time of not greater than 2.0 seconds and shall not melt and drip.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 19:59:46 EST 2015

Committee Statement

Committee Statement:
The current means for determining material melting during the flame resistance test is unclear. By relating this determination to observed dripping, clearer guidance is provided to the laboratory for interpreting the results of this test. A related revision is being provided to make changes in the test method for the interpretation of results.

Response Message:
Public Comment No. 33-NFPA 1991-2014 [Section No. 7.4.2]

Ballot Results

- This item has passed ballot
- 29 Eligible Voters
- 7 Not Returned
- 22 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Footwear upper materials shall be tested for permeation resistance as specified in Section 8.6 and shall not exceed a cumulative permeation of 6.0 μg/cm² for the 1-hour test period and a cumulative permeation that does not exceed 2.0 μg/cm² for each 15-minute interval within the 1-hour test period for each chemical tested.

Submitter Information Verification

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<th>Submitter Full Name:</th>
<th>Dave Trebisacci</th>
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<td>Street Address:</td>
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<td>Submittal Date:</td>
<td>Tue Jan 20 20:02:12 EST 2015</td>
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</table>

Committee Statement

The TC believes that the inclusion of 15 minute cumulative assessments will alleviate the risk of “spiking” phenomena going undetected. The revision to set the 60 minute limit at 6.0 ug/cm² will permit permeation at a much higher level than what the existing certified materials have actually demonstrated. Since the rationale made for cumulative is based on chemical warfare agent dose testing, then the limit for 60 minutes should match the majority of CWAs tested – 1.25 ug/cm². The TC believes that setting the 15 minute interval limit at ½ the total permitted is reasonable.

Ballot Results

- This item has passed ballot
  - 29 Eligible Voters
    - 7 Not Returned
    - 21 Affirmative All
      - 0 Affirmative with Comments
      - 1 Negative with Comments
      - 0 Abstention
- Not Returned
  - Buck, Ted S.
  - Kelly, Bruce S.
  - North, John W.
  - Ott, Louis V.
  - Starrett, William M.
  - Thompson, Donald B.
  - Wisner, Jr., John E.
- Affirmative All
  - Allen, Jason L.
  - Baxter, Christina M.
  - Beggs, Dale Gregory
  - Clifford, Brian J.
  - Corrado, Steven D.
  - Daly, Jr., Richard P.
  - Fithian, William A.
  - Greene, Russell R.
  - Haines, Todd W.
  - Harkness, A. Ira
  - Haskell, III, William E.
  - Kienzle, Michael P.
  - Lancaster, Beth C.
  - Lehtonen, Karen E.
  - Lovasic, Susan L.
  - Mann, Philip C.
  - Rogers, Paul G.
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<td>Zeigler, James P.</td>
<td></td>
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<td>Ziskin, Michael</td>
<td></td>
</tr>
<tr>
<td>Nystrom, Ulf</td>
<td>I am against the change to cumulative permeation.</td>
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7.5.1.3 Footwear upper materials shall be tested for permeation resistance as specified in Section 8.6 and shall not exceed a cumulative permeation of 6.0 μg/cm² for each 1-hour test period and a cumulative permeation that does not exceed 2.0 μg/cm² for each 15-minute interval within the 1-hour test period for each additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jan 20 20:03:15 EST 2015

Committee Statement

Committee Statement:
The TC believes that the inclusion of 15 minute cumulative assessments will alleviate the risk of “spiking” phenomena going undetected. The revision to set the 60 minute limit at 6.0 ug/cm² will permit permeation at a much higher level than what the existing certified materials have actually demonstrated. Since the rationale made for cumulative is based on chemical warfare agent dose testing, then the limit for 60 minutes should match the majority of CWAs tested – 1.25 ug/cm². The TC believes that setting the 15 minute interval limit at ½ the total permitted is reasonable.

Response Message:
Public Comment No. 97-NFPA 1991-2014 [Section No. 7.5.1.3]

Ballot Results

✅ This item has passed ballot

29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
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<tr>
<td>Zeigler, James P.</td>
</tr>
<tr>
<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>

**Negative with Comment**

Nystrom, Ulf

I am against the change to cumulative permeation.
Second Revision No. 28-NFPA 1991-2015 [Section No. 7.5.2]

7.5.2
Footwear upper materials shall be tested for resistance to flame impingement as specified in Section 8.7 and shall have an afterflame time of not greater than 2.0 seconds and shall not melt and drip.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jan 20 20:04:41 EST 2015

Committee Statement

Committee Statement: The current means for determining material melting during the flame resistance test is unclear. By relating this determination to observed dripping, clearer guidance is provided to the laboratory for interpreting the results of this test. A related revision is being provided to make changes in the test method for the interpretation of results.

Response Message:
Public Comment No. 34-NFPA 1991-2014 [Section No. 7.5.2]

Ballot Results

- This item has passed ballot
  - 29 Eligible Voters
  - 7 Not Returned
  - 22 Affirmative All
    - 0 Affirmative with Comments
    - 0 Negative with Comments
    - 0 Abstention

- Not Returned
  - Buck, Ted S.
  - Kelly, Bruce S.
  - North, John W.
  - Ott, Louis V.
  - Starrett, William M.
  - Thompson, Donald B.
  - Wisner, Jr., John E.

- Affirmative All
  - Allen, Jason L.
  - Baxter, Christina M.
  - Beggs, Dale Gregory
  - Clifford, Brian J.
  - Corrado, Steven D.
  - Daly, Jr., Richard P.
  - Fithian, William A.
  - Greene, Russell R.
  - Haines, Todd W.
  - Harkness, A. Ira
  - Haskell, III, William E.
  - Kienzle, Michael P.
  - Lancaster, Beth C.
  - Lehtonen, Karen E.
  - Lovasic, Susan L.
  - Mann, Philip C.
  - Nystrom, Ulf
  - Rogers, Paul G.
  - Shelton, Robert E.
  - Stull, Jeffrey O.
7.5.5 Footwear heels and soles shall be tested for abrasion resistance as specified in Section 8.19, and the relative volume loss shall not be greater than 250 mm$^3$.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jan 20 20:06:49 EST 2015

Committee Statement

Committee Statement: The TC believes that abrasion resistance should be measured on entire bottom side of boot and not just the heel.

Response Message:
Public Comment No. 49-NFPA 1991-2014 [Section No. 7.5.5]

Ballot Results

☑ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
7.5.7
Footwear soles and heels shall be tested for slip resistance as specified in Section 8.21 and shall have a coefficient of 0.40 or greater.

7.5.8
Footwear toes shall be tested for impact and compression resistance as specified in Section 8.30, and shall have an impact resistance of not less than 101.7 J (75 ft-lb) and shall have a compression resistance of not less than 11,121 N (2500 lbf).

7.5.9
Footwear soles and heels shall be tested for puncture resistance as specified in Section 8.29 and shall show no puncture.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Feb 13 12:46:23 EST 2015

Committee Statement

Committee Statement: The TC is adding testing requirements for footwear toes, soles and heels.
Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
<table>
<thead>
<tr>
<th>Stull, Jeffrey O.</th>
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<tr>
<td>Zeigler, James P.</td>
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<tr>
<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>
7.7.4
Primary suit, visor, glove, and footwear element materials shall be tested for resistance to flame impingement as specified in Section 8.7 and shall have afterflame time not greater than 2.0 seconds during the initial 3-second exposure period, shall not burn a distance of greater than 100 mm (4 in.), shall not sustain burning for more than 2 seconds, and shall not melt and drip during the subsequent 12-second exposure period.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jan 20 20:45:10 EST 2015

Committee Statement
Committee Statement: The current means for determining material melting during the flame resistance test is unclear. By relating this determination to observed dripping, clearer guidance is provided to the laboratory for interpreting the results of this test. A related revision is being provided to make changes to the test method for the interpretation of results.

Response Message: 

Public Comment No. 35-NFPA 1991-2014 [Section No. 7.7.4]

Ballot Results
This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Second Revision No. 34-NFPA 1991-2015 [ Section No. 7.8 ]

Section 7.8 Optional Liquefied Gas Protection Performance Requirements for Vapor-Protective Ensembles and Ensemble Elements.

7.8.1 Vapor-protective ensembles and ensemble elements that will be certified as compliant with the additional optional criteria for liquefied gas protection for escape only shall also meet all applicable requirements in Sections 7.1 through 7.5. 

7.8.2 Primary suit, glove, and footwear element materials shall be tested for liquefied gas permeation resistance as specified in Section 8.6 and shall not show signs of damage, and shall not exhibit a normalized breakthrough detection time of 15 minutes or less for the following list of gaseous industrial chemicals:

- Ammonia
- Chlorine
- Ethylene oxide

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 20 21:25:18 EST 2015

Committee Statement

Committee Statement: This section is being deleted as it is a duplicate of section 7.6.
Response Message:

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
7.9 Optional Chemical Flash Fire Protection Performance Requirements for Vapor-Protective Ensembles and Ensemble Elements.

7.9.1 Vapor-protective ensembles and ensemble elements that will be certified as compliant with the additional optional criteria for chemical flash fire protection for escape only shall also meet all applicable requirements in Sections 7.1 through 7.5.

7.9.2 Vapor-protective ensembles and elements shall be tested for overall ensemble flash protection as specified by Section 8.25; shall not have any afterflame times longer than 2 seconds; shall show an ending pressure of at least 13 mm ($\frac{1}{2}$ in.) water gauge in the subsequent gastight integrity testing; and shall permit visual acuity through the visor of 20/100 or better.

7.9.3 Primary suit, glove, and footwear element materials shall be tested for heat transfer performance (HTP) as specified in Section 8.18, and shall have an average HTP rating of not less than 12.

7.9.4 Primary suit, glove, and footwear element materials shall be tested for resistance to flame impingement as specified in Section 8.7, and shall not ignite during the initial 3-second exposure period, shall not burn a distance of greater than 100 mm (4 in.), shall not sustain burning for more than 2 seconds, and shall not melt as evidenced by flowing or dripping during the subsequent 12-second exposure period.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jan 20 21:26:26 EST 2015

Committee Statement

Committee Statement: This section is being deleted as it is a duplicate of section 7.7.
Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
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Haskell, III, William E.
Kienzle, Michael P.
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<td>Zeigler, James P.</td>
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<tr>
<td>Ziskin, Michael</td>
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8.1.2.1
Samples or specimens shall be conditioned at a temperature of 21°C, ±3°C (70°F, ±5°F) and a relative humidity of 65 percent, ±5 percent until equilibrium is reached, as specified in ASTM D1776, Standard Practice for Conditioning and Testing Textiles. Specimens shall be tested within 5 minutes after removal from conditioning.

8.1.2.2
Specimens shall be tested within 5 minutes after removal from conditioning.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 11 22:39:38 EDT 2015

Committee Statement

Committee Statement: The TC is adding a requirement for the testing of specimens.
Response Message:

Ballot Results

This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
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Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
8.1.2.3
Specimens shall be tested within 5 minutes after removal from conditioning.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Mar 30 16:46:30 EDT 2015

Committee Statement

Committee Statement: This is a duplicate statement of 8.1.2.2.
Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
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Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 36-NFPA 1991-2015 [ Section No. 8.1.4.1 ]

8.1.4.1 Samples shall be abraded in accordance with ASTM D4157, Standard Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method), under the following conditions:

1. A 2.3 kg (5 lb) tension weight shall be used.
2. A 1.6 kg (3½ lb) head weight shall be used.
3. If the ensemble does not employ a separable inner and outer layer, the outer surface shall be abraded with an 80 grit abradant trimite D-weight open coat #1A4180, or equivalent.
4. If the ensemble employs a separable inner and outer layer, in which the inner layer is the chemical barrier layer, the following shall apply:
   (a) The abradant of the outer surface of the inner suit shall be the inner surface of the outer layer.
   (b) The abradant of the outer surface of the outer layer shall be 80 grit trimite D-weight open coat #1A4180, or equivalent.
5. The specimen shall be abraded for 25 continuous cycles for (3) and (4)(b), and 200 continuous cycles for (4)(a).

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 11:09:37 EST 2015

Committee Statement

Committee Statement: The TC believes that it is irrelevant whether the "inner layer is the chemical barrier layer" or not. If a two layer garment system is used in the 1991 ensemble, then the abrasion test should always abrade the outside of the inner suit with the inside of the outer suit.

Response Message:
Public Comment No. 39-NFPA 1991-2014 [Section No. 8.1.4.1]

Ballot Results

☑ This item has passed ballot
29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
It was agreed by the TC that outer cover garments shall only be allowed to fulfill optional requirements, not the base requirements. The way this clause is written now the inner garment would not be exposed to the abrasion procedure specified as the base requirement.
8.3.5 Procedure.
Liquidtight integrity testing of garments shall be conducted in accordance with ASTM F1359, Standard Test Method for Measuring Liquid Penetration Resistance of Protective Clothing or Protective Ensembles Using a Manikin, with the following modifications:

(1) The method used for mounting the manikin in the spray chamber shall not interfere with the water spray.

(2) The suited manikin shall be exposed to the liquid spray for a total of 1 hour, 15 minutes in each of the four specified manikin orientations.

(3) At the end of the liquid spray exposure period, excess liquid shall be removed from the surface of the specimen.

(4) The specimen shall be inspected within 5 minutes of the end of the liquid spray exposure period for evidence of liquid penetration.

Submitter Information Verification
Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 11 21:12:49 EDT 2015

Committee Statement
Committee Statement: The TC is correcting the title of the ASTM standard.
Response Message:

Ballot Results
✔ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
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Daly, Jr., Richard P.
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Greene, Russell R.
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Harkness, A. Ira
Haskell, III, William E.
Kiendl, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.4 Overall Ensemble Function and Integrity Test.

8.4.1 Application.
This test method shall apply to vapor-protective ensembles.

8.4.2 Sample Preparation.
8.4.2.1 Samples shall be complete vapor-protective ensembles.

8.4.2.2 Samples shall be conditioned as specified in 8.1.2.

8.4.3 Specimens.
8.4.3.1 Specimens shall be complete vapor-protective ensembles.

8.4.3.2 At least three specimens shall be tested using a different test subject for each specimen.

8.4.3.3 Where the vapor-protective ensemble consists of multiple separate layers, and outer layers are not considered gastight, then only the portion of the vapor-protective suit that is considered gastight shall be tested.

8.4.4 Apparatus.
The equipment and supplies specified in ASTM F1154, Standard Practices for Qualitatively Evaluating the Comfort, Fit, Function, and Integrity of Chemical Protective Suit Ensembles and Ensemble Components, shall be used along with the following additional items:

(1) A Snellen eye chart for a 6 m (20 ft) distance

(2) A stopwatch or other timing device

(3) A protractor or other device to measure the angle of a word card or NFPA 704 placard relative to the test subject

(4) NFPA 704-based placard as seen in Figure 8.4.4

Figure 8.4.4 NFPA 704 Placard.

8.4.5 Procedure.
8.4.5.1 Suit overall function and integrity shall be measured in accordance with ASTM F1154, Standard Practices for Qualitatively Evaluating the Comfort, Fit, Function, and Integrity of Chemical Protective Suit Ensembles and Ensemble Components, with the following parameters:

(1) Both exercise procedures A and B shall be used.

(2) Ensembles tested shall meet the sizing range of the test subject as determined in 5.3.1.4. The suit shall be donned in accordance with the manufacturer’s instructions.

(3) Testing shall be conducted at 25°C ±7°C (77°F ±10°F) and relative humidity of 50 percent, ±20 percent.

(4) Test subjects shall wear head protection meeting the dimensional requirements of Type I, Class G helmets of ANSI Z89.1, Standard for Industrial Head Protection, while carrying out the exercise protocols.

(5) Test subjects shall wear underclothing in accordance with the manufacturer’s recommendations, or in lieu of a detailed recommendation, a full-body coverall.

(6) Test subjects shall wear a self-contained breathing apparatus (SCBA) that is compliant with NFPA 1981
Visual acuity testing shall be conducted using the eye chart, with a normal lighting range of 100 through 150 \textit{ft.} foot-candles (fc) at the chart and with the test subject \textit{positioned} at a distance of 6.1 m (20 ft) from the chart.

8.4.5.2.1
The test subject shall have a minimum visual acuity of 20/20 in each eye, uncorrected or corrected \textit{with contact lenses}, as determined in a visual acuity test or doctor's examination.

8.4.5.2.2
The test subject shall read the standard eye chart through the lens of the SCBA facepiece and suit visor to determine the ensemble visor's impact on the test subject's visual acuity.

8.4.5.3
The field of vision for the test subject shall be assessed \textit{by determining the angular degree to the left and right where the test subject can read four random 10 mm high letters from a distance of 6 m (20 ft) that is 2 m (6 ft) off of the ground} for the up, down, left, and right orientation angles using the NFPA 704-based placard with random numbers between 0 and 4 in each of the quadrants. The placard shall be 2 m (6 ft) off of the ground/–0.1 m away from the eye of the test subject and perpendicular to field of view line of sight being measured.

8.4.5.4
At the end of all testing, the test subject shall be instructed to remove his or her hands from each of the gloves while still wearing the suit, touch the bypass valve on the SCBA, and then reinsert his or her hands into the gloves. The test subject shall perform this action in accordance with the manufacturer’s instructions. This action shall be sequentially repeated a total of five times. The time for completing this action shall be timed using a stopwatch or other suitable timing device.

8.4.5.5
Gastight integrity shall be measured as specified in Section 8.2 upon completion of the exercise protocols.

8.4.6

8.4.6.1
The end suit pressure shall be recorded and reported.

8.4.6.2
The ability of the test subject to satisfactorily complete all exercises while wearing head protection meeting the dimensional requirements of Type I, Class G helmets of ANSI Z89.1, \textit{Standard for Industrial Head Protection}, shall be recorded and reported.

8.4.6.3
The visual acuity of the test subject when in and out of the suit shall be recorded and reported.

8.4.6.4
The angular degree for both the up, down, left, and right defining the field of vision shall be measured and reported. The average angular degree for \textit{the left and right field of vision} each direction for all test subjects shall be calculated and reported.

8.4.6.5
The time for each test subject to \textit{repeatedly remove completely remove his or her hands from the gloves} and reinsert his or her hands \textit{completely} into the gloves five times sequentially shall be recorded and reported. The average time for all test subjects shall be calculated and reported.

8.4.7
Interpretation.

8.4.7.1
Following the test subject exercises, an ending suit pressure after inflation testing \textit{in accordance with Section 8.2} shall be used to determine pass or fail performance.

8.4.7.2
The ability of the test subject to satisfactorily complete all exercises while wearing head protection meeting the dimensional requirements of Type I, Class G helmets of ANSI Z89.1, \textit{Standard for Industrial Head Protection}, shall be used to determine pass or fail performance.

8.4.7.3
The visual acuity of the test subject when inside the suit shall be used for determining pass or fail performance.

8.4.7.4
The average \textit{left and average right} angular field of vision shall be used to determine pass or fail performance in each direction.

8.4.7.5
The average time of for all test subjects to \textit{repeatedly remove completely remove their hands from the gloves} and reinsert their \textit{completely hands} into the gloves five times sequentially shall determine pass or fail performance.

Supplemental Information

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Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 11:31:27 EST 2015

Committee Statement

Committee Statement: The TC is revising parts of the overall ensemble function and integrity test based on information provided via an NFPA 1991 user survey.
### Ballot Results

- **This item has passed ballot**
  - 29 Eligible Voters
  - 7 Not Returned
  - 22 Affirmative All
    - 0 Affirmative with Comments
    - 0 Negative with Comments
    - 0 Abstention

#### Not Returned
- Buck, Ted S.
- Kelly, Bruce S.
- North, John W.
- Ott, Louis V.
- Starrett, William M.
- Thompson, Donald B.
- Wisner, Jr., John E.

#### Affirmative All
- Allen, Jason L.
- Baxter, Christina M.
- Beggs, Dale Gregory
- Clifford, Brian J.
- Corrado, Steven D.
- Daly, Jr., Richard P.
- Fithian, William A.
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- Lehtonen, Karen E.
- Lovasic, Susan L.
- Mann, Philip C.
- Nystrom, Ulf
- Rogers, Paul G.
- Shelton, Robert E.
- Stull, Jeffrey O.
- Zeigler, James P.
- Ziskin, Michael

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National Fire Protection Association Report

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
Permeation resistance shall be measured in accordance with ASTM F739, Standard Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids and Gases. Permeation of Liquids and Gases Through Protective Clothing Materials Under Conditions of Continuous Contact, with the following modifications:

1. **Cumulative** Total cumulative permeation shall be measured for a period of 1 hour, +1 minute, –0 minutes, and each 15-minute interval of the 1-hour exposure.

2. Testing shall be performed at a temperature of 32°C, ±2°C (90°F, ±4°F).

3. The minimum detectable cumulative permeation mass shall be determined for each chemical tested and shall be at least 0.6 µg/cm² or lower.

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**Supplemental Information**

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**Submitter Information Verification**

- **Submitter Full Name:** Dave Trebisacci
- **Organization:** [Not Specified]
- **Street Address:**
- **City:**
- **State:**
- **Zip:**
- **Submittal Date:** Wed Jan 21 12:04:25 EST 2015

**Committee Statement**

- **Committee Statement:** The TC believes that the measurement of cumulative permeation at 15 minute intervals is intended to ensure that large amount of permeation do not occur at any one interval within the 1-hour test period.

- **Response Message:** The TC is adding explanatory text on cumulative permeation.

**Ballot Results**

- This item has passed ballot

  - 29 Eligible Voters
  - 7 Not Returned
  - 21 Affirmative All
  - 0 Affirmative with Comments
  - 1 Negative with Comments
  - 0 Abstention

- **Not Returned**
  - Buck, Ted S.
  - Kelly, Bruce S.
  - North, John W.
  - Ott, Louis V.
  - Starrett, William M.
  - Thompson, Donald B.
  - Wisner, Jr., John E.

- **Affirmative All**
  - Allen, Jason L.
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  - Clifford, Brian J.
  - Corrado, Steven D.
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<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>

**Negative with Comment**

Nystrom, Ulf

I am against the change to cumulative permeation.
8.6.4.2
Permeation resistance shall be measured for each of the following chemicals at its normal laboratory-grade concentration ≥ 95 percent concentration unless noted otherwise, with gases at a concentration of 99.0 percent or greater, except as indicated in the following list:

1. Acetone
2. Acetonitrile
3. Acrolein
4. Acrylonitrile
5. Anhydrous ammonia (gas)
6. 1,3-Butadiene (gas)
7. Carbon disulfide
8. Chlorine (gas)
9. Dichloromethane
10. Diethyl amine
11. Dimethyl formamide
12. Dimethyl sulfate
13. Ethyl acetate
14. Ethylene oxide (gas)
15. Hexane
16. Hydrogen chloride (gas)
17. Methanol
18. Methyl chloride (gas)
19. Nitrobenzene
20. Sodium hydroxide, 50 percent w/w
21. Sulfuric acid, 96.1 percent w/w
22. Tetrachloroethylene
23. Tetrahydrofuran
24. Toluene

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 12:12:31 EST 2015

Committee Statement
Committee Statement: The TC is providing more detailed specifications on the concentration of liquid chemicals. The 24 chemicals represent a combination of the original 21 chemicals plus 3 additional toxic industrial chemicals that were previously included for CBRN testing.

Response Message: 

Ballot Results

This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention
Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskel, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasie, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 40-NFPA 1991-2015 [Section No. 8.6.5.1]

### 8.6.5.1

The following information and results shall be recorded and reported:

1. Material type or name
2. Chemical or chemical mixture (volume composition of mixture)
3. Cumulative permeation mass ($\mu g/cm^2$) for each 15-minute interval and for the entire 1-hour test period
4. Minimum detectable cumulative permeation mass ($\mu g/cm^2$)
5. Detection method
6. Date of test
7. Testing laboratory

---

**Submitter Information Verification**

Submitter Full Name: Dave Trebisacci  
Organization: [Not Specified]  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Wed Jan 21 12:17:11 EST 2015

**Committee Statement**

Committee Statement: The TC believes that the measurement of cumulative permeation at 15 minute intervals is intended to ensure that large amount of permeation do not occur at any one interval within the 1-hour test period.

**Response Message:**  
Public Comment No. 182-NFPA 1991-2014 [Section No. 8.6.5.1]

**Ballot Results**

- **This item has passed ballot**
  - 29 Eligible Voters
  - 7 Not Returned
  - 21 Affirmative All
  - 0 Affirmative with Comments
  - 1 Negative with Comments
  - 0 Abstention

**Not Returned**

- Buck, Ted S.
- Kelly, Bruce S.
- North, John W.
- Ott, Louis V.
- Starrett, William M.
- Thompson, Donald B.
- Wisner, Jr., John E.

**Affirmative All**

- Allen, Jason L.
- Baxter, Christina M.
- Beggs, Dale Gregory
- Clifford, Brian J.
- Corrado, Steven D.
- Daly, Jr., Richard P.
- Fithian, William A.
- Greene, Russell R.
- Haines, Todd W.
- Harkness, A. Ira
- Haskell, III, William E.
I am against the change to cumulative permeation.
The average cumulative permeation mass shall be determined for each chemical for each 15-minute exposure interval and for the entire 1-hour test period.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 12:19:30 EST 2015

Committee Statement

Committee Statement: The TC believes that the measurement of cumulative permeation at 15 minute intervals is intended to ensure that large amount of permeation do not occur at any one interval within the 1-hour test period.

Response Message:

Public Comment No. 183-NFPA 1991-2014 [Section No. 8.6.5.2 [Excluding any Sub-Sections]]

Ballot Results

This item has passed ballot

29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Negative with Comment
Nystrom, Ulf
I am against the change to cumulative permeation.
8.6.5.3
The manufacturer shall report the average cumulative permeation masses for each 15-minute exposure interval and for the entire 1-hour test period in the technical data package.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 12:19:55 EST 2015

Committee Statement
Committee Statement: The TC believes that the measurement of cumulative permeation at 15 minute intervals is intended to ensure that large amount of permeation do not occur at any one interval within the 1-hour test period.
Response Message:

Ballot Results
✓ This item has passed ballot
29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention
Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.
Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
I am against the change to cumulative permeation.
8.6.6 Interpretation.
The average cumulative permeation mass for each 15-minute exposure interval and for the total 1-hour exposure period shall be used in determining compliance for the particular material/chemical combination.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 12:22:46 EST 2015

Committee Statement
Committee Statement: The TC believes that the measurement of cumulative permeation at 15 minute intervals is intended to ensure that large amount of permeation do not occur at any one interval within the 1-hour test period.
Response
Message: Public Comment No. 185-NFPA 1991-2014 [Section No. 8.6.6]

Ballot Results
✔ This item has passed ballot
29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
I am against the change to cumulative permeation.
8.6.11.3 Visor materials that are rigid and cannot be bent in the test apparatus shall be excluded from this conditioning.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 12:31:24 EST 2015

Committee Statement

Committee Statement: The TC is deleting this paragraph as it believes that all "visors" must be assessed to the same set of standards. Exclusions for "rigid" visors just because they cannot be tested in a specific test apparatus is not acceptable. Some replacement test to assess the same performance property for rigid visors must be included. All visors should be held to a comparable performance standard.

Response Message:

Ballot Results

☑ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
8.6.11.5
Cumulative permeation shall be measured for a period of 15 minutes, ±1 minute, −0 minutes.

Committee Statement
The TC believes that modifications are required to limit this testing to 15 minutes as originally specified in the 2005 edition of NFPA 1991.

Response Message:
Public Comment No. 180-NFPA 1991-2014 [New Section after 8.6.11.5]

Ballot Results
✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
<table>
<thead>
<tr>
<th>Negative with Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nystrom, Ulf</td>
</tr>
<tr>
<td>I am against the change to cumulative permeation.</td>
</tr>
</tbody>
</table>
Second Revision No. 81-NFPA 1991-2015 [ Section No. 8.7.4 ]

8.7.4 Procedure.

Flame resistance testing shall be conducted in accordance with ASTM F1358, Standard Test Method for Effects of Flame Impingement on Materials Used in Protective Clothing Not Designated Primarily for Flame Resistance, with the following modifications:

1. The test apparatus shall include the test cabinet and accessories, burner, and gas regulation system, as specified in Sections 6.1, 6.2, and 6.3 of ASTM D6413, Standard Test Method for Flame Resistance of Textiles (Vertical Test).

2. A specimen shall have been considered to ignite during the 3-second exposure when the measured afterflame time exceeds 2.0 seconds. Specimens shall be observed for the combination of both melting and dripping.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 21:20:12 EST 2015

Committee Statement

Committee Statement: The Technical Committee consolidated a number of related Public Comments into one comment to ensure that no conflict was created in the overall changes to this test method. Specific changes included using the combination of melting and dripping to define non-compliance of observed burning behavior, the use of the longer 12-second exposure for the optional chemical flash fire protection ensemble requirements, and the use of average afterflame and burn distances to determine material compliance.

Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 82-NFPA 1991-2015 [Section No. 8.7.5.4]

8.7.5.4 Evidence of melting, both melting and dripping during the 12-second exposure period shall be recorded and reported for each specimen.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 21:21:26 EST 2015

Committee Statement

Committee Statement: The Technical Committee consolidated a number of related Public Comments into one comment to ensure that no conflict was created in the overall changes to this test method. Specific changes included using the combination of melting and dripping to define non-compliance of observed burning behavior, the use of the longer 12-second exposure for the optional chemical flash fire protection ensemble requirements, and the use of average afterflame and burn distances to determine material compliance.

Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
8.7.6.2
The longest average afterflame time in any direction shall be used to determine compliance with the afterflame requirements.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:

Committee Statement

Committee Statement: The Technical Committee consolidated a number of related Public Comments into one comment to ensure that no conflict was created in the overall changes to this test method. Specific changes included using the combination of melting and dripping to define non-compliance of observed burning behavior, the use of the longer 12-second exposure for the optional chemical flash fire protection ensemble requirements, and the use of average afterflame and burn distances to determine material compliance.

Response Message:

Ballot Results

☑ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill., William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
8.7.6.3
The longest average burn distance in any direction shall be used to determine compliance with burn distance requirements.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:

Committee Statement
The Technical Committee consolidated a number of related Public Comments into one comment to ensure that no conflict was created in the overall changes to this test method. Specific changes included using the combination of melting and dripping to define non-compliance of observed burning behavior, the use of the longer 12-second exposure for the optional chemical flash fire protection ensemble requirements, and the use of average afterflame and burn distances to determine material compliance.

Response Message:

Ballot Results
☑ This item has passed ballot
29 Eligible Voters
  7 Not Returned
22 Affirmative All
  0 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
8.7.6.4 Evidence of melting both melting and dripping of any specimen shall be used to determine compliance with melting and dripping requirements.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 21:23:33 EST 2015

Committee Statement

Committee Statement: The Technical Committee consolidated a number of related Public Comments into one comment to ensure that no conflict was created in the overall changes to this test method. Specific changes included using the combination of melting and dripping to define non-compliance of observed burning behavior, the use of the longer 12-second exposure for the optional chemical flash fire protection ensemble requirements, and the use of average afterflame and burn distances to determine material compliance.

Response Message:

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
8.7.8 Specific Requirements for Testing Optional Chemical Flash Fire Protection Ensemble Materials.

The full procedures in ASTM F1358, Standard Test Method for Effects of Flame Impingement on Materials Used in Protective Clothing Not Designated Primarily for Flame Resistance, shall be used including both the 3-second and 12-second exposures.

8.7.8.1 Only the 12-second flame exposure shall be used.

8.7.8.2 Burn distances and afterflame times shall be determined only for the 12-second exposure.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 21:24:35 EST 2015

Committee Statement

Committee Statement: The Technical Committee consolidated a number of related Public Comments into one comment to ensure that no conflict was created in the overall changes to this test method. Specific changes included using the combination of melting and dripping to define non-compliance of observed burning behavior, the use of the longer 12-second exposure for the optional chemical flash fire protection ensemble requirements, and the use of average afterflame and burn distances to determine material compliance.

Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
8.8.2.1
Samples for conditioning shall be complete ensembles and shall include the respirator where the ensemble utilizes the respirator facepiece as the ensemble visor.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Feb 04 09:32:10 EST 2015

Committee Statement
Committee Statement: The TC decided to address non-encapsulated ensembles in a new Class 1 of the next edition of NFPA 1994.
Response Message:

Ballot Results
✓ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill., William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.8.3.1 The specimens shall be a complete ensemble with gloves and footwear and shall include the respirator where applicable.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Feb 04 09:34:30 EST 2015

Committee Statement

Committee Statement: The TC decided to address non-encapsulated ensembles in a new Class 1 of the next edition of NFPA 1994.
Response Message:

Ballot Results

✔ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.8.3.2 Where the ensemble utilizes the respirator facepiece as the ensemble visor, the ensemble shall be tested with each type or model of the respirator specified by the manufacturer.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Feb 04 09:35:24 EST 2015

Committee Statement

Committee Statement: The TC decided to address non-encapsulated ensembles in a new Class 1 of the next edition of NFPA 1994.

Response Message:

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Where the respirator is completely encapsulated by the ensemble, the ensemble shall be tested with a respirator specified by the manufacturer.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Feb 04 09:36:45 EST 2015

Committee Statement

Committee Statement: The TC decided to address non-encapsulated ensembles in a new Class 1 of the next edition of NFPA 1994.

Response Message:

Ballot Results

✓ This item has passed ballot
  29 Eligible Voters
  7 Not Returned
  22 Affirmative All
    0 Affirmative with Comments
    0 Negative with Comments
    0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 46-NFPA 1991-2015 [Section No. 8.8.4.2.2]

8.8.4.2.2*
The standard concentration of MeS in the vapor chamber shall be 100 mg/m$^3$, ±15 mg/m$^3$, as measured by a real-time infrared analysis of the chamber air or other validated real-time analytical technique.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 13:10:52 EST 2015

Committee Statement

Committee Statement: The TC believes that a change in challenge concentration from 100 mg/m$^3$ ± 15 mg/m$^3$ to 150 mg/m$^3$ ± 10 mg/m$^3$ allows for an increased sensitivity in the PAD analysis after the test is completed. This increase in sensitivity is required to adequately assess the high protection of the 1991 ensembles. Decreasing the tolerance to ±10 mg/m$^3$ will require test labs to have more control over the test conditions and provide a more consistent challenge exposure.

Response Message:

Public Comment No. 75-NFPA 1991-2014 [Section No. 8.8.4.2.2]

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Groene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael

**Negative with Comment**

Nystrom, Ulf

I am against the change of test method to MIST and of the substantial lowering of the PF requirement in this standard.
8.8.6.3.1
The determination of a sufficiently low temperature that prevents migration of the MeS from the adhesive shall be made by exposing 12 pads simultaneously in the test chamber in a vertical position at a concentration of 100 mg/m$^3$ of MeS for 30 min, ±5 min. After this exposure, the pads shall be covered in foil and each placed in a sealed container and stored at 25°C, ±3°C (77°F, ±5°F) for 30 min, ±5 min. Four of these pads shall be packed in dry ice for 24 hours, four placed in the proposed cold storage temperature for 24 hours, and four extracted or analyzed within 4 hours. The average mass absorbed on the four pads stored at the proposed storage temperature shall equal with 95% confidence the average mass absorbed on the four pads stored for 24 hours in dry ice and the four pads analyzed immediately after exposure.
Negative with Comment
Nystrom, Ulf
I am against the change of test method to MIST and of the substantial lowering of the PF requirement in this standard.
The dosage measured by each PAD ($C_{\text{inside},i}$) shall be determined using the average uptake rate determined for the PAD lot used in the evaluation of a specific ensemble using the following equation:

$$C_{\text{inside},i} = \frac{m_i}{u_{\text{avg}}A}$$

where:

- $C_{\text{inside},i}$ is the MeS vapor dosage at the specific PAD in mg/min/cm$^3$
- $m_i$ is the total mass of MeS measured on the specific PAD in mg
- $u_{\text{avg}}$ is the average uptake of the PAD lot in cm/min
- $A$ is the average active area of the PA in cm$^2$

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 11 21:54:33 EDT 2015

Committee Statement

Committee Statement: The TC is making corrections to the units in this paragraph.
Response Message:

Ballot Results

- This item has passed ballot
- 29 Eligible Voters
- 7 Not Returned
- 21 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 1 Abstention

Not Returned
- Buck, Ted S.
- Kelly, Bruce S.
- North, John W.
- Ott, Louis V.
- Starrett, William M.
- Thompson, Donald B.
- Wisner, Jr., John E.

Affirmative All
- Allen, Jason L.
- Baxter, Christina M.
- Beggs, Dale Gregory
- Clifford, Brian J.
- Corrado, Steven D.
- Daly, Jr., Richard P.
- Fithian, William A.
- Greene, Russell R.
- Haines, Todd W.
- Harkness, A. Ira
- Haskell, III, William E.
- Kienzle, Michael P.
- Lancaster, Beth C.
- Lehtonen, Karen E.
- Lovasic, Susan L.
- Mann, Philip C.
<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rogers, Paul G.</td>
</tr>
<tr>
<td>Shelton, Robert E.</td>
</tr>
<tr>
<td>Stull, Jeffrey O.</td>
</tr>
<tr>
<td>Zeigler, James P.</td>
</tr>
<tr>
<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>

**Abstention**

Nystrom, Ulf

I am against the change of test method to MIST and of the substantial lowering of the PF requirement in this standard.
All results for each PAD location shall be expressed in terms of the local physiological protective dosage factor (PPDF) value and shall be calculated according to the following equation:

\[ L_{local} \text{ PPDF}_i = \left( \frac{OSED_i}{25} \right)^s \text{ PF} \]  

[8.8.7.2]

where:

OSED = onset of symptoms exposure dosages
PF = protection factor

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Mar 11 22:20:06 EDT 2015

Committee Statement

Committee Statement: The TC is making these changes for consistency with other sections of the standard.
Response Message:

Ballot Results

- This item has passed ballot
- 29 Eligible Voters
- 7 Not Returned
- 21 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 1 Abstention

Not Returned

Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All

Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
<table>
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<tr>
<th>Zeigler, James P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>

**Abstention**

Nystrom, Ulf

I am against the change of test method to MIST and of the substantial lowering of the PF requirement in this standard.
8.8.7.2.1*
The site-specific onset of symptoms exposure dosages (OSED) for each PAD shall be based on EC_{10} values for mustard blistering/ulceration according to Table 8.8.7.2.1.

Table 8.8.7.2.1 Site-Specific OSED by PAD Location

<table>
<thead>
<tr>
<th>Body Region</th>
<th>PAD Location</th>
<th>OSED (mg•min^-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head/neck</td>
<td>1, 1A, 2, 3, 4, 5, 6, 10A, 19A, 2, 3, 4, 5, 6, 7, 26, 27</td>
<td>100</td>
</tr>
<tr>
<td>Torso/buttocks (excluding perineum)</td>
<td>11, 12, 13A, 14A, 15A, 13, 14, 15, 16, 17, 18, 19</td>
<td>100</td>
</tr>
<tr>
<td>Arm/hand</td>
<td>7, 8, 9, 10, 10A, 20, 20A, 8, 9, 10, 11, 12, 26, 29</td>
<td>50</td>
</tr>
<tr>
<td>Leg/foot</td>
<td>47, 47A, 5, 5, 20, 22, 23, 24, 25, 30</td>
<td>100</td>
</tr>
<tr>
<td>Perineum</td>
<td>16, 16A, 20, 21</td>
<td>25</td>
</tr>
</tbody>
</table>

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 13:14:19 EST 2015

Committee Statement

Committee Statement: The PAD locations in Table 8.8.7.2.1 have been corrected to correspond to the appropriate numbers/locations provided in Figure 8.8.5.2.

Response Message:
Public Comment No. 76-NFPA 1991-2014 [Section No. 8.8.7.2.1]

Ballot Results

☑ This item has passed ballot
29 Eligible Voters
7 Not Returned
21 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
1 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. IRA
Haskell, III, William E.
Kienzle, Michael P.
| Lancaster, Beth C.                  |
| Lehtonen, Karen E.                |
| Lovasic, Susan L.                 |
| Mann, Philip C.                   |
| Rogers, Paul G.                   |
| Shelton, Robert E.                |
| Stull, Jeffrey O.                 |
| Zeigler, James P.                 |
| Ziskin, Michael                   |

**Abstention**

Nystrom, Ulf

I am against the change of test method to MIST and of the substantial lowering of the PF requirement in this standard.
A systemic PPDF shall also be calculated from the PAD data. The systemic protection analysis shall use the systemic weighting body region hazard analysis values from the Defense Research Establishment Suffield Report and National Research Council Report to calculate the systemic physiological protective dosage factor for each ensemble test (PPDF$_{sys}$). The PPDF$_{sys}$ for each specimen is calculated as follows, where each of the terms is calculated using the information in Table 8.8.7.3.

\[
PPDF_{sys} = \frac{\sum_i (zd_i / ED_{50i})}{\sum_i (zd_i / ED_{50i} \times PF_i)}
\]

<table>
<thead>
<tr>
<th>Body Region / for BRHA Model</th>
<th>PADs Mapped to This Region (Average Dosage from Each PAD. Then Calculate PF$_i$)</th>
<th>Area of Body Region (dz$_i$, cm$^2$)</th>
<th>ED$_{50i}$ for Severe Effects (VX) for Body Region (mg/Individual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalp</td>
<td>1, 2</td>
<td>350</td>
<td>0.76</td>
</tr>
<tr>
<td>Ears</td>
<td>2, 3, 4</td>
<td>50</td>
<td>0.46</td>
</tr>
<tr>
<td>Face, cheeks, and neck</td>
<td>4, 5, 10, 10A 5, 6, 26, 27</td>
<td>300</td>
<td>0.48</td>
</tr>
<tr>
<td>Chin and neck</td>
<td>4, 5, 6</td>
<td>200</td>
<td>0.36</td>
</tr>
<tr>
<td>Nape</td>
<td>6, 7</td>
<td>100</td>
<td>1.72</td>
</tr>
<tr>
<td>Abdomen</td>
<td>13A 16</td>
<td>2858</td>
<td>2.23</td>
</tr>
<tr>
<td>Back</td>
<td>11, 12, 14A 13, 14, 18</td>
<td>2540</td>
<td>2.65</td>
</tr>
<tr>
<td>Axillae</td>
<td>7, 8</td>
<td>200</td>
<td>2.07</td>
</tr>
<tr>
<td>Upper arm medial</td>
<td>8, 9</td>
<td>488</td>
<td>2.8</td>
</tr>
<tr>
<td>Upper arm lateral</td>
<td>9, 10</td>
<td>706</td>
<td>6.57</td>
</tr>
<tr>
<td>Elbow</td>
<td>8, 9, 10, 10A 9, 10, 11, 12</td>
<td>50</td>
<td>2.09</td>
</tr>
<tr>
<td>Elbow</td>
<td>8, 9, 10, 10A 9, 10, 11, 12</td>
<td>50</td>
<td>2.25</td>
</tr>
<tr>
<td>Forearm extensor</td>
<td>10, 10A 11, 12</td>
<td>487</td>
<td>2.8</td>
</tr>
<tr>
<td>Forearm flexor</td>
<td>10, 10A 11, 12</td>
<td>706</td>
<td>6.57</td>
</tr>
<tr>
<td>Hands dorsum</td>
<td>20, 20A 26, 29</td>
<td>200</td>
<td>2.91</td>
</tr>
<tr>
<td>Hands palmar</td>
<td>20, 20A 26, 29</td>
<td>200</td>
<td>9.24</td>
</tr>
<tr>
<td>Buttocks</td>
<td>14, 17</td>
<td>953</td>
<td>4.26</td>
</tr>
<tr>
<td>Groin</td>
<td>13, 15, 15, 19</td>
<td>300</td>
<td>1.22</td>
</tr>
<tr>
<td>Scrotum</td>
<td>16, 16A 20, 21</td>
<td>200</td>
<td>0.11</td>
</tr>
<tr>
<td>Thigh anterior</td>
<td>12, 17A 22, 23</td>
<td>2845</td>
<td>6.57</td>
</tr>
<tr>
<td>Thigh posterior</td>
<td>12, 17A 22, 23</td>
<td>1422</td>
<td>4.26</td>
</tr>
<tr>
<td>Knee</td>
<td>17, 17A 18, 18A 22, 23, 24, 25</td>
<td>200</td>
<td>7.14</td>
</tr>
<tr>
<td>Popliteal space (back of knees)</td>
<td>17, 17A 18, 18A 22, 23, 24, 25</td>
<td>100</td>
<td>2.09</td>
</tr>
<tr>
<td>Shins</td>
<td>18, 18A 24, 25</td>
<td>1897</td>
<td>6.57</td>
</tr>
<tr>
<td>Calves</td>
<td>18, 18A 24, 25</td>
<td>948</td>
<td>2.8</td>
</tr>
<tr>
<td>Feet dorsum</td>
<td>24, 30</td>
<td>500</td>
<td>6.6</td>
</tr>
<tr>
<td>Feet plantar</td>
<td>24, 30</td>
<td>300</td>
<td>7.14</td>
</tr>
</tbody>
</table>

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 13:15:24 EST 2015

Committee Statement

Committee Statement: The PAD locations that are listed in Table 8.8.7.3 have been corrected to correspond to the appropriate numbers/locations provided in Figure 8.8.5.2.

Response Message:

Public Comment No. 78-NFPA 1991-2014 [Section No. 8.8.7.3 [Excluding any Sub-Sections]]

Ballot Results

✔ This item has passed ballot
Eligible Voters: 29
Not Returned: 7
Affirmative All: 21
Affirmative with Comments: 0
Negative with Comments: 0
Abstention: 1

Not Returned:
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All:
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael

Abstention:
Nystrom, Ulf

I am against the change of test method to MIST and of the substantial lowering of the PF requirement in this standard.
8.8.7.3.2*

The protection factor, \( PF_i \), used in the calculation of \( PPDF_{sys} \) shall be the average, \( PF \), of all PADs in a specific body region.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 13:19:17 EST 2015

Committee Statement

Committee Statement: The TC is providing clarification that the PF used to calculate the systemic PPDF is not the same as the PF used to calculate the local PPDF.

Response Message: 

Ballot Results

- This item has passed ballot
- 29 Eligible Voters
- 7 Not Returned
- 21 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 1 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael

Abstention
Nystrom, Ulf

I am against the change of test method to MIST and of the substantial lowering of the PF requirement in this standard.
8.15.7 Specific Requirements for Testing Glove Materials.

8.15.7.1 Specimens shall be taken from the back and palm of the glove and shall not include seams.

8.15.7.2 Specimens shall consist of each composite of the glove used in the actual ensemble glove configuration, with layers arranged in the proper order.

8.15.7.3 Where a composite is identical to another composite except for additional reinforcement layer(s), the composite with no reinforcement layers shall be tested.

8.15.7.4 Cut resistance testing shall be performed under a load of 150 g (5.5 oz).

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 14:17:22 EST 2015

Committee Statement

Committee Statement: The TC is providing clarification as to the locations of samples.
Response Message:

Ballot Results

☑ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
8.15.8.1 Specimens shall be taken from the parts of the footwear upper that provide uniform thickness and shall not include seams.

8.15.8.2 Specimens shall consist of each composite of the footwear upper used in the actual ensemble footwear configuration, with layers arranged in the proper order.

8.15.8.3 Where a composite is identical to another composite except for additional reinforcement layer(s), the composite with no reinforcement layers shall be tested.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: [ Not Specified ]
City: [ Not Specified ]
State: [ Not Specified ]
Zip: [ Not Specified ]
Submittal Date: Wed Jan 21 14:21:50 EST 2015

Committee Statement

Committee Statement: The TC is providing clarification of sample locations.
Response Message: [ Not Specified ]

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Second Revision No. 50-NFPA 1991-2015 [Section No. 8.16.4]

8.16.4 Procedure.
Specimens shall be tested in accordance with ASTM F1342, Standard Test Method for Resistance of Protective Clothing Materials to Puncture, Test Method A, conducting three punctures per specimen with the modifications listed in 8.16.4.1 through 8.16.4.2.

8.16.4.1 A 0.025 mm (0.01 in.) thick, ultrahigh molecular weight, high-density polyethylene shall be used as a standard reference material.

8.16.4.2 Puncture probes shall be qualified first before use in testing by showing an average puncture resistance of 10.3 N (2.3 lbf). The compression load cell shall be capable of discerning 0.5 N (0.1 lbf) of force in the range suitable for the material being tested. The upper limit of the load cell shall not be more than 10 times the actual puncture resistance measured for the specimens.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 13:44:28 EST 2015

Committee Statement
Committee Statement: The TC believes that there is not enough specificity to determine if you have the correct reference standard. In section 8.16.4.2 as written, the puncture resistance would have to have an exact level of performance.

Ballot Results
This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
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Haskell, III, William E.
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<th>Lovasic, Susan L.</th>
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<tr>
<td>Mann, Philip C.</td>
</tr>
<tr>
<td>Nystrom, Ulf</td>
</tr>
<tr>
<td>Rogers, Paul G.</td>
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<tr>
<td>Shelton, Robert E.</td>
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<tr>
<td>Stull, Jeffrey O.</td>
</tr>
<tr>
<td>Zeigler, James P.</td>
</tr>
<tr>
<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>
8.16.5.1 The puncture force shall be recorded and reported for each specimen to the nearest \( \pm 0.5 \) N (\( \pm 0.125 \) lbf) of force.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 14:05:24 EST 2015

Committee Statement

Committee Statement: The TC is providing this change for correlation with other sections in this document.
Response Message:

Ballot Results

✔ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.16.7.1  
Specimens shall be taken from the glove and shall not include seams. Consist of each composite of the palm, palm side of the fingers, and back of the glove used in actual suit glove configuration, with layers arranged in the proper order.

8.16.7.2  
Specimens shall consist of each composite of the palm, palm side of the fingers, and back of the glove used in the actual suit ensemble glove configuration, with layers arranged in the proper order.

8.16.7.3  
Where a composite is identical to another composite except for additional reinforcement layer(s), the composite with no reinforcement layers shall be tested.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci  
Organization: [ Not Specified ]  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Wed Jan 21 14:07:08 EST 2015

Committee Statement

Committee Statement: The TC is providing a clarification of sample locations.  
Response Message:

Ballot Results

✓ This item has passed ballot

29 Eligible Voters  
7 Not Returned  
22 Affirmative All  
0 Affirmative with Comments  
0 Negative with Comments  
0 Abstention

Not Returned
Buck, Ted S.  
Kelly, Bruce S.  
North, John W.  
Ott, Louis V.  
Starrett, William M.  
Thompson, Donald B.  
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.  
Baxter, Christina M.  
Beggs, Dale Gregory  
Clifford, Brian J.  
Corrado, Steven D.  
Daly, Jr., Richard P.  
Fithian, William A.  
Greene, Russell R.  
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Kienzle, Michael P.  
Lancaster, Beth C.  
Lehtonen, Karen E.  
Lovasic, Susan L.  
Mann, Philip C.  
Nystrom, Ulf  
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.16.7.4
Where the specimen composites of the palm, palm side of the fingers, and back of the glove are identical, only one representative composite shall be required to be tested.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 14:11:12 EST 2015

Committee Statement

Committee Statement: This paragraph is being deleted, and is now incorporated in 8.16.7.1.
Response Message: 

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
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Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
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Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
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Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.16.8 Specific Requirements for Testing Footwear Upper Materials.

8.16.8.1 Specimens shall be taken from the footwear upper up to the minimum height specified in 6.3.2 and shall not include seams, consist of each composite of the footwear item used in the actual suit footwear configuration, with layers arranged in proper order.

8.16.8.2 Specimens shall consist of each composite of the footwear upper used in the actual suit ensemble footwear configuration, with layers arranged in proper order.

8.16.8.3 Where a composite is identical to another composite except for additional reinforcement layer(s), the composite with no reinforcement layers shall be tested.

8.16.8.4 Specimens shall be taken from the thinnest portion of the footwear upper.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci  
Organization: [Not Specified]  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Wed Jan 21 14:12:03 EST 2015

Committee Statement

Committee Statement: The TC is providing this change to clarify sample locations.
Response Message:

Ballot Results

☑️ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
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Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.16.8.4
Specimens shall be taken from the thinnest portion of the footwear upper.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submital Date: Wed Jan 21 14:16:08 EST 2015

Committee Statement

Committee Statement: The TC is deleting this paragraph, which is now found in 8.16.8.1.
Response Message:

Ballot Results

✔ This item has passed ballot
29 Eligible Voters
  7 Not Returned
  22 Affirmative All
  0 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
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Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
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Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.19.1 Application.
This test method shall apply to vapor-protective footwear element soles with and heels.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address:
City:
State:
Zip:
Submital Date: Wed Jan 21 14:26:34 EST 2015

Committee Statement
Committee Statement: The TC believes that the entire bottom of the footwear element be evaluated.
Response Message:
Public Comment No. 63-NFPA 1991-2014 [Section No. 8.19.1]

Ballot Results
This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
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Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 87-NFPA 1991-2015 [Section No. 8.21]

8.21 Slip Resistance Test.
8.21.1 Application.
This test method shall apply to footwear.
8.21.2 Samples.
8.21.2.1 Samples shall be complete footwear.
8.21.2.2 Samples shall be conditioned as specified in ISO 13287, Personal Protective Equipment—Footwear—Test Method for Slip Resistance.
Samples shall be conditioned as specified in ASTM F2913, Standard Test Method for Measuring the Coefficient of Friction for Evaluation of Slip Performance of Footwear and Test Surfaces/Flooring Using a Whole Shoe Tester.
8.21.3 Specimens.
8.21.3.1 Specimens shall be complete footwear elements in men’s size 9D, medium width, or equivalent.
8.21.3.2 At least three specimens shall be tested.
8.21.4 Procedure.
Slip resistance testing shall be performed in accordance with ISO 13287, Personal Protective Equipment—Footwear—Test Method for Slip Resistance, in the following configurations and references to any other flooring and/or contaminate within ISO 13287 shall not apply. Slip resistance testing shall be performed in accordance with ASTM F2913, Standard Test Method for Measuring the Coefficient of Friction for Evaluation of Slip Performance of Footwear and Test Surfaces/Flooring Using a Whole Shoe Tester, in the following configurations, and references to any other flooring or contaminate within ASTM F2913 shall not apply:

(1) Footwear shall be tested both in the forepart and heel positions.
(2) Footwear shall be tested in the wet condition. The wet condition shall be achieved using distilled or de-ionized water. The water shall be applied to thoroughly wet the testing surface and make a pool at least as wide and as long as the test portion of the footwear in the area of initial contact.
(3) Footwear shall be tested on a quarry tile surface that meets the following specifications: Footwear shall be tested on a quarry tile surface that meets the specifications of ASTM F2913 and shall not be calibrated in accordance with ASTM F2913. The calibration frequency of 10 tests specified in ASTM F2913 shall be equivalent to 50 test runs.

Table of Calibration Values for Quarry Tiles

<table>
<thead>
<tr>
<th></th>
<th>Dry CoF</th>
<th>Wet CoF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>0.57</td>
<td>0.43</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.63</td>
<td>0.40</td>
</tr>
</tbody>
</table>

8.21.5 Report.
8.21.5.1 The coefficient of friction of each specimen shall be recorded and reported.
8.21.5.2 The average coefficient of friction of all specimens for each configuration shall be calculated, recorded, and reported.
8.21.6 Interpretation.
The average coefficient of friction for each configuration shall be used to determine pass/fail performance.

Supplemental Information

File Name: SR_87_NFPA_1991_New_Section_8.21.docx Description: Word Doc with new Section 8.21

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Committee Statement

Committee Statement: The TC is replacing the test method with an updated version.

Response Message:

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
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Corrado, Steven D.
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Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
At least one specimen shall be tested.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 14:29:50 EST 2015

Committee Statement

Committee Statement: The TC believes that based on committee and task group discussions, it has been determined that one specimen is not sufficient to determine whether or not a product complies with this test.

Response Message:
Public Comment No. 131-NFPA 1991-2014 [Section No. 8.25.3.3]

Ballot Results

This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Second Revision No. 88-NFPA 1991-2015 [Section No. 8.25.4.5.1]

8.25.4.5.1
Prior to testing each day, thermocouples shall be placed in the empty chamber so that temperature measurements are taken at the following heights from the floor: 30 cm (12 in.), 76 cm (30 in.), 122 cm (48 in.), 168 cm (66 in.), and 213 cm (84 in.). All heights are ± 2.5 cm (± 1 in.). Two Schmidt-Boelter heat flux gauges shall be mounted in a thermally insulated fixture with the face of the gauges situated perpendicular to the floor, oriented toward the ignition source, and mounted in the center of the chamber.

8.25.4.5.2
The sensors shall be located 122 cm (48 in.) and 152 cm (60 in.) from the chamber floor.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submittal Date: Wed Jan 21 21:45:12 EST 2015

Committee Statement
Committee Statement: The TC decided that heat flux data would be valuable to obtain.
Response Message:

Ballot Results
✔ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
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Greene, Russell R.
Haines, Todd W.
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Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submittal Date: Wed Jan 21 21:45:12 EST 2015

Committee Statement
Committee Statement: The TC decided that heat flux data would be valuable to obtain.
Response Message:

Ballot Results
✔ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
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Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
8.25.4.5.3
A data acquisition system shall be used to collect the temperature readings during the burn exposure and shall be sufficient to provide at least 1 temperature reading per second for each thermocouple used heat flux readings during the verification exposure and shall be sufficient to provide at least one heat flux reading every tenth of a second.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 21:48:56 EST 2015

Committee Statement

Committee Statement: The TC believes that gathering heat flux information is valuable.
Response Message:

Ballot Results

✔ This item has passed ballot
29 Eligible Voters
  7 Not Returned
  22 Affirmative All
  0 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
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Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
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Beggs, Dale Gregory
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Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
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Harkness, A. Ira
Haskell, Ill, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.25.4.5.4
Propane gas, at 99 percent purity or better, shall be metered into the chamber at a delivery pressure of 172.3 kPa, ±13.8 kPa (25 psi, ±2 psi) and a rate of 0.16 m³/min, ±0.01 m³/min (5 ½ ft³/min, ±½ ft³/min) for 2 minutes, ±1 minute, to produce a visible chemical flash fire lasting 7 seconds, ±1 second. The exact time that it takes to produce a visible chemical flash fire lasting 7 seconds, ±1 second, shall be recorded. The concentration of the propane shall be permitted to be checked by a combustible gas meter or similar detector.

8.25.4.5.4.1
An initial calibration exposure shall be conducted to verify that the propane gas conditions produce a visible chemical flash fire lasting 7 seconds, ±1 second.

8.25.4.5.4.2
If not achieved, the fill time shall be adjusted with a subsequent calibration exposure to verify performance.

8.25.4.5.4.3
The exact fill time that it takes required to produce a visible chemical flash fire lasting 7 seconds, ±1 second, shall be recorded.

8.25.4.5.4.4
The concentration of the propane shall be permitted to be checked by a combustible gas meter or similar detector.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 14:31:19 EST 2015

Committee Statement

Committee Statement:
The TC believes that as initially written, no explanation that adjustments may need to be made to achieve the 7 +/- 1 second visible flame requirement was provided.

Response Message:
Public Comment No. 64-NFPA 1991-2014 [Section No. 8.25.4.5.3]

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
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| Lehtonen, Karen E. |
| Lovasic, Susan L. |
| Mann, Philip C. |
| Nystrom, Ulf |
| Rogers, Paul G. |
| Shelton, Robert E. |
| Stull, Jeffrey O. |
| Zeigler, James P. |
| Ziskin, Michael |
8.25.4.5.5

After determining the adequate time required to create a flash fire exposure lasting 7 seconds, ±1 second, flash fire exposure, the data collected from the thermocouples shall be evaluated to determine the maximum temperatures reached during the exposure at each height location. The maximum average temperature of all locations shall be within a temperature range of 650°C to 1150°C (1202°F to 2102°F), heat flux sensors shall be recorded.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Submitter Information Verification

Committee Statement

Committee Statement: The TC believes that heat flux data is valuable to obtain.

Response Message:

Ballot Results

✓ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

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Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 61-NFPA 1991-2015 [Section No. 8.25.5.3]

8.25.5.3
Propane gas, at 99 percent purity or better, shall be metered into the chamber at a delivery pressure of 172.3 kPa, ±13.8 kPa (25 psi, ±2 psi) and a rate of 0.16 m$^3$/min, ±0.01 m$^3$/min (5 1⁄2 ft$^3$/min, ±1⁄2 ft$^3$/min). The concentration of propane within the chamber shall be sufficient for 2 minutes, ±1 minute, to produce a visible chemical flash fire lasting 7 seconds, ±1 second. The concentration of the propane shall be permitted to be checked by a combustible gas meter or similar detector.

8.25.5.3.1
The concentration of propane within the chamber shall be sufficient to produce a visible chemical flash fire lasting 7 seconds, ±1 second, shall be recorded.

8.25.5.3.2
The concentration of the propane shall be permitted to be checked by a combustible gas meter or similar detector.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 14:41:43 EST 2015

Committee Statement
Committee Statement: The TC is revising the requirement to ensure that the procedure for testing matches the verification procedure.
Response Message:
Public Comment No. 134-NFPA 1991-2014 [Section No. 8.25.5.3]

Ballot Results
- This item has passed ballot
- 29 Eligible Voters
- 7 Not Returned
- 22 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

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Lehtonen, Karen E.
Lovasic, Susan L.
8.25.6.1 The before and after gastight integrity test results, afterflame time, visor clarity, relative humidity, and ambient temperature shall be recorded and reported for each test specimen.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jan 21 14:43:03 EST 2015

Committee Statement

Committee Statement: The TC believes that if relative humidity and ambient temperature is required to be measured during set up, it should be required to be reported.

Response Message: Public Comment No. 67-NFPA 1991-2014 [Section No. 8.25.6.1]

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill., William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Second Revision No. 91-NFPA 1991-2015 [Section No. 8.25.6.4]

8.25.6.4
The verification burn maximum average temperature of all locations shall be recorded and reported.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submital Date: Wed Jan 21 21:54:54 EST 2015

Committee Statement

Committee Statement: The TC is deleting this paragraph since it is no longer relevant to the verification procedure.
Response Message:

Ballot Results

☑️ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.28 Visor Drop-Ball Impact Resistance Test.
8.28.1 Application.
8.28.1.1 This test shall apply to visor materials.
8.28.1.2 Where the visor is constructed of several layers, then all layers, assembled in the order in which they appear in the suit, shall be tested as a composite.

8.28.2 Sample Preparation.
8.28.2.1 Samples shall be at least 2 m$^2$ (2 yd$^2$) of material.
8.28.2.2 Samples shall be conditioned as specified in 8.1.2.

8.28.3 Specimens.
8.28.3.1 Specimens shall be 450 mm × 305 mm.
8.28.3.2 A minimum of five specimens shall be tested.

8.28.4 Procedure.
Specimens shall be tested in accordance with Section 9.6 of ANSI Z87.1, American National Standard for Occupational and Educational Personal Eye and Face Protective Devices, with the following modifications:

- Visor material shall be securely mounted to the test fixture as shown in Figure 8.28.4.
- The sample number shall be indicated.
- The impact location shall be in the center of the visor.

Figure 8.28.4 Test Fixture.
Visible penetration or full-thickness cracks shall be recorded and reported.

Interpretation:

Penetration or full-thickness cracking on any single impact shall be used to determine compliance.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 21 14:50:25 EST 2015

Committee Statement

Committee Statement: The TC is deleting this test method because it fails to properly differentiate visor materials.
Response Message:
Public Comment No. 82-NFPA 1991-2014 [Section No. 8.28]

Ballot Results

This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
8.28.4 Procedure.
Specimens shall be tested in accordance with Section 9.11 of ANSI Z87.1, American National Standard for Occupational and Educational Personal Eye and Face Protective Devices, with the following modifications:

1. Visor material shall be securely mounted to the test fixture, as shown in Figure 8.28.4.
2. The sample number shall be indicated.
3. The impact location shall be in the center apex of the visor, between the frame members.
4. Testing shall be performed on samples conditioned for a minimum of 4 hours at –25°C, ±2 °C (–13°F, ±4 °F).
5. Testing shall commence between 60 seconds and 90 seconds after removal from the cold chamber.
6. The sample shall not be allowed to move more than 6 mm (0.25 in.). If a sample moves more than 6 mm (0.25 in.), the sample shall be discarded and a new sample shall be tested.
8.29 Visor Puncture Resistance Test Two

8.29.1 Application.
This test method shall apply to the puncture resistant device of vapor-protective footwear.

8.29.1.1 Where the visor is constructed of several layers, then all layers, assembled in the order in which they appear in the suit, shall be tested as a composite.

8.29.2 Sample Preparation.

8.29.2.1 Samples shall be at least 2 m² (2 yd²) of material footwear puncture resistant devices.

8.29.2.2 Samples shall be conditioned as specified in 8.1.2.

8.29.3 Specimens.

8.29.3.1 Specimens shall be 450 mm x 305 mm footwear puncture resistant devices.

8.29.3.2 A minimum of five specimens shall be tested.

8.29.4 Procedure.
Specimens shall be tested in accordance with Section 9.13 of ANSI Z87.1, American National Standard for Occupational and Educational Personal Eye and Face Protective Devices, with the following modifications:

Visor material shall be securely mounted to the test fixture as shown in Figure 8.29.4.

The sample number shall be indicated.

The impact location shall be in the center of the visor.

8.29.4.1 Puncture resistance shall be performed in accordance with Section 5 of ASTM F2412, Standard Test Methods for Footwear Protection.

8.29.4.2 The test shall be performed under an applied force of 1200 N (270 lbf).

8.29.4.3 The penetration of the test pin tip shall be viewed at a 90-degree angle to determine if the tip penetrates the puncture resistant device.

8.29.4.4 The observation shall be made if the test pin tip penetrates the puncture resistant device.

8.29.5 Report.

8.29.5.1 Visible penetration of the impactor shall be recorded and reported. Whether or not the test pin tip is observed shall be reported for each specimen.

8.29.5.2 Interpretation.

Penetration on any single impact shall be used to determine compliance. One or more footwear specimens showing penetration of the test pin shall constitute failing performance.

8.29.6 Supplemental Information

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**File Name**

SR_65_Text_NFPA_1991_Word_Doc.docx

**Description**

Word Doc rewrite for new 8.30 and 8.31 for SR 65.

---

**Submitter Information Verification**

**Submitter Full Name:** Dave Trebisacci

**Organization:** [Not Specified]

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Wed Jan 21 15:03:49 EST 2015

---

**Committee Statement**

**Committee Statement:** The TC decided to reference the ASTM test methods and performance criteria instead of the specifications.

The TC is also adding two tests, Puncture Resistance Test Two, and Impact and Compression Tests to the end of this Chapter.

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**Response Message:**

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181 of 194 4/29/2015 9:30 AM
**Ballot Results**

- **This item has passed ballot**
  - 29 Eligible Voters
  - 7 Not Returned
  - 22 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 0 Abstention

### Not Returned
- Buck, Ted S.
- Kelly, Bruce S.
- North, John W.
- Ott, Louis V.
- Starrett, William M.
- Thompson, Donald B.
- Wisner, Jr., John E.

### Affirmative All
- Allen, Jason L.
- Baxter, Christina M.
- Beggs, Dale Gregory
- Clifford, Brian J.
- Corrado, Steven D.
- Daly, Jr., Richard P.
- Fithian, William A.
- Greene, Russell R.
- Haines, Todd W.
- Harkness, A. Ira
- Haskell, III, William E.
- Kienzle, Michael P.
- Lancaster, Beth C.
- Lehtonen, Karen E.
- Lovasic, Susan L.
- Mann, Philip C.
- Nystrom, Ulf
- Rogers, Paul G.
- Shelton, Robert E.
- Stull, Jeffrey O.
- Zeigler, James P.
- Ziskin, Michael
Visor Material.
Nonencapsulating suits do not have visor material.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submit Date: Wed Jan 21 18:17:06 EST 2015

Committee Statement
Committee Statement: All requirements which applied to the "visor" in the previous edition of the standard will now need to be expanded to include traditional visor materials and all elements of a non-encapsulating suit ensemble to ensure the same level of performance apply to all non-encapsulating and encapsulating suit designs.

Response Message:
Public Comment No. 22-NFPA 1991-2014 [Section No. A.3.3.72]

Ballot Results
This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven O.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
A.5.2
Purchasers should consider testing prospective suits by evaluating their comfort, function, fit, and integrity as specified in ASTM F1154, Standard Practices for Qualitatively Evaluating the Comfort, Function, and Integrity Durability of Chemical Protective Suit Ensembles and Ensemble Components. These practices entail having a test subject don the suit and wear it during a series of exercises. Two exercise batteries are used. The first includes a number of in-place exercises such as toe touches, deep knee bends, and cross arm reaches that are intended to assess the subject's mobility and create stresses on different parts of the suit. The second involves more realistic activities such as crawling, climbing a ladder, turning a valve, operating a hand truck, and coiling a hose. These tasks attempt to simulate actions that an emergency responder might undertake during a hazardous materials emergency.

Purchasers and users should be aware that no reliable, nondestructive methods exist to determine the level of contamination for exposed vapor-protective ensembles or their materials. Therefore, users will not be able to determine how effective decontamination methods are in removing chemical contamination from the vapor-protective suit. Vapor-protective ensembles that have received a significant exposure to a chemical or chemical mixture in the estimation of the responsible supervisor should be disposed of.

Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 11 23:21:47 EDT 2015

Committee Statement

Committee Statement: The TC is correcting the title of the ASTM standard.
Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
A.5.3.1.4
Manufacturers should determine the size range of their ensembles by matching human dimensions with available suit sizes. These determinations should account for other clothing and equipment to be worn by the wearer as recommended by the manufacturer. Assessment of acceptable fit should be determined by using ASTM F1154, Standard Practices for Qualitatively Evaluating the Comfort, Fit, Function, and Integrity Durability of Chemical Protective Suit Ensembles and Ensemble Components.

Submitter Information Verification
Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 11 23:24:44 EDT 2015

Committee Statement
Committee Statement: The TC is correcting the title of the ASTM standard.
Response Message:

Ballot Results
This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 127-NFPA 1991-2015 [Section No. B.1.1]

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

Submitter Information Verification
Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 11 23:29:47 EDT 2015

Committee Statement
Committee Statement: The TC is correcting the titles of NFPA standards.
Response Message:

Ballot Results
✓ This item has passed ballot
29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
### B.1.2.1 ASTM Publications

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


### B.1.2.2 FEMA Publications


Responder Knowledge Base, [https://www.llis.dhs.gov/knowledgebase/](https://www.llis.dhs.gov/knowledgebase/)

### Submitter Information Verification

**Submitter Full Name:** David Trebisacci  
**Organization:** National Fire Protection Assoc  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Wed Mar 11 23:32:50 EDT 2015

### Committee Statement

**Committee Statement:** The TC is correcting the titles of ASTM standards and providing the URL for the Responder Knowledge Base.

### Response Message:

**Ballot Results**

- This item has passed ballot
- 29 Eligible Voters  
- 7 Not Returned  
- 22 Affirmative All  
- 0 Affirmative with Comments  
- 0 Negative with Comments  
- 0 Abstention

**Not Returned**

- Buck, Ted S.  
- Kelly, Bruce S.  
- North, John W.  
- Ott, Louis V.  
- Starrett, William M.  
- Thompson, Donald B.  
- Wisner, Jr., John E.

**Affirmative All**

- Allen, Jason L.  
- Baxter, Christina M.  
- Beggs, Dale Gregory  
- Clifford, Brian J.  
- Corrado, Steven D.  
- Daly, Jr., Richard P.  
- Fithian, William A.  
- Greene, Russell R.  
- Haines, Todd W.  
- Harkness, A. Ira  
- Haskell, III, William E.  
- Kienzle, Michael P.  
- Lancaster, Beth C.  
- Lehtonen, Karen E.  
- Lovasic, Susan L.  
- Mann, Philip C.
B.1.2.3 ISO Publications.
International Organization for Standardization, 1, rue de Varembé, Case postale 56, CH-1211 Geneva 20, Switzerland.
ISO 27, Guidelines for corrective action to be taken by a certification body in the event of misuse of its mark of conformity, 1983.
ISO 9001, Quality management systems — Requirements, 2003
ISO/IEC 17065, Conformity assessment — Requirements for bodies certifying products, processes and services, 2012.

Submitter Information Verification
Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Mar 11 23:42:28 EDT 2015

Committee Statement
Committee Statement: The TC is adding additional references cited in the Annex.
Response Message:

Ballot Results
☑ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All
Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Second Revision No. 116-NFPA 1991-2015 [Section No. B.1.2.5]

B.1.2.6 Other Publications.


Submitter Information Verification

Submitter Full Name: David Trebisacci
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 11 12:49:50 EDT 2015

Committee Statement

Committee Statement: The TC has deleted the reference to the Webster Dictionary in Annex B, and has added it to Chapter 2.
Response Message:

Ballot Results

✔ This item has passed ballot

29 Eligible Voters
7 Not Returned
22 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Buck, Ted S.
Kelly, Bruce S.
North, John W.
Ott, Louis V.
Starrett, William M.
Thompson, Donald B.
Wisner, Jr., John E.

Affirmative All

Allen, Jason L.
Baxter, Christina M.
Beggs, Dale Gregory
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Fithian, William A.
Greene, Russell R.
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kienzle, Michael P.
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
Zeigler, James P.
Ziskin, Michael