MEMORANDUM

TO: Technical Committee on Emergency Medical Services Protective Clothing and Equipment

FROM: Yvonne Smith, Project Administrator

DATE: December 17, 2015

SUBJECT: NFPA 1999 First Draft Technical Committee FINAL Ballot Results (A2017)

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

15 Members Eligible to Vote
2 Members Not Returned (J. E. Davis, M. Laton)
12 Members Voted Affirmative on All Revisions
1 Members Voted Negative on one or more Revisions (P. Freeman)
0 Members Abstained 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 revision.

To pass ballot, each revision requires: (1) a simple majority of those eligible to vote and (2) an affirmative vote of \( \frac{2}{3} \) of ballots returned. See Sections 3.3.4.3.(c) and [First Draft reference 4.3.10.1] of the Regulations Governing the Development of NFPA Standards.
1.1.1* This standard shall specify the minimum design, performance, testing, documentation, and certification requirements for new single-use and new multiple-use emergency medical operations protective clothing, including garments, helmets, gloves, footwear, and face protection devices, used by emergency medical responders prior to arrival at medical care facilities, and used by medical first receivers at medical care facilities during emergency medical operations, and used by health care workers providing medical and supportive care.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Sep 02 13:39:56 EDT 2015

Committee Statement
Committee Statement: The TC is adding hospital-based healthcare workers providing medical and supportive care, including hospital-based workers, because there is a need for those providers to have performance requirements addressing single-use and multi-use ensembles.

Ballot Results
This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention
Not Returned:
Davis, James E.
Laton, Michael A.
Affirmative All:
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Flinn, William A.
Freire, Patricia A.
Hanes, David P.
Haskett, B. William E.
Hickerson, Barry L.
Lancaster, Britt C.
Larson, Karen E.
Mahan, Philip C.
Patriot, Richard W.
Sodlier, Jeff
1.1.3 This standard shall also specify additional minimum design, performance, testing, documentation, and certification as requirements for medical emergency use emergency medical protective ensembles that provide limited protection from specified CBRN terrorism agents.
1.1.4 Other than for emergency medical protective ensembles that are certified as compliant with the CBRN requirements of this standard, any protective masks, respirators, or other protective equipment for respiratory protection and protection from airborne pathogens shall not be interpreted as specifying requirements for respiratory protection, and protection from airborne pathogens.

This standard shall also specify requirements for respiratory protective devices that are not already covered in 42 CFR 84, "Approval for Respiratory Protective Devices," that are intended for emergency medical operations by first responders, first接收ers, and health-care workers providing medical and supportive care.

Committee Statement

The TC believes that specialized forms of respirator devices are needed to address protection from highly infectious diseases as may be used by first responders, first receivers, and healthcare workers providing medical and supportive care. For example, 42 CFR part 84 does not cover the barrier qualities of hoods used in powered air-purifying respirators.

Response Message

Public Input No. 93-NFPA 1999-2015 [Section No. 1.1.5]
1.1.5 Certification of all emergency medical ensemble elements and protective clothing items, and medical care facility ensemble elements and protective clothing items, as compliant with the requirements of this standard, shall not preclude certification to additional appropriate standards where the ensemble elements or protective clothing items meet all applicable requirements of each standard.

<table>
<thead>
<tr>
<th>Supplemental Information</th>
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<td><strong>File Name</strong></td>
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</tr>
</tbody>
</table>

Submitter Information Verification

- **Submitter Full Name**: Dave Trebisacci
- **Organization**: Not Specified
- **Street Address**:
- **City**:
- **State**:
- **Zip**:
- **Submittal Date**: Tue Sep 01 12:00:17 EDT 2015

Committee Statement

- **Committee Statement**:
  - The Correlating Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1994. The CBRN class of ensemble requirements in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 6. Proposed changes to NFPA 1999 remove all language in the scope, referenced test methods, definitions, design criteria, performance criteria, test methods, and appendix pertaining to CBRN. Proposed changes to NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 6. A separate statement has been added to the Annex in A.1.1.4 to indicate that CBRN requirements will be addressed in NFPA 1994.

- **Response Message**: The TC is adding explanatory text to the Annex, so an asterisk is being added to 1.1.6.

Ballot Results

- **15 Eligible Voters**
- **2 Not Returned**
- **13 Affirmative All**
- **0 Affirmative with Comments**
- **0 Negative with Comments**
- **0 Abstention**

**Not Returned**
- Davis, James E.
- Laton, Michael A.

**Affirmative All**
- Allen, Jason L.
- Corrado, Steven D.
- Davis, Todd P.
- Ehrman, William A.
- Fawcett, Patricia A.
- Harris, David R.
- Haskell, III, William E.
- Hickerson, Barry L.
- Lancaster, Beth C.
- Laton, Michael A.
- Lehtonen, Karen E.
- Mann, Philip C.
- Patrick, Richard W.
- Sadtler, Jeff
A.1.1.6

NFPA 1994, *Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents*, establishes three different classes of ensembles addressing the hazards present during chemical, biological, or radiological particulate terrorism incidents. These ensembles consist of full body one- or multi-piece suit, gloves, and footwear.

The Class 2 ensemble can be designed with the CBRN SCBA worn inside or outside of the ensemble and is intended for wearer protection in an immediately dangerous to life and health (IDLH) environment. Ensembles are tested for their integrity to both vapors and liquids. Materials are tested for permeation resistance to selected chemical agent and toxic industrial chemicals at concentrations consistent with the same levels used for evaluating CBRN SCBA; materials are also tested for viral penetration resistance, and various physical properties to demonstrate adequate physical hazard resistance and durability for the intended use. Ensemble categories include single use and multiple use. Ensembles are tested for functionality.

Class 3 ensembles can be designed for use with CBRN SCBA, CBRN APR, or CBRN PAPR, though CBRN APR and CBRN PAPR are consistent with the use of this ensemble. The Class 3 ensemble is designed for protection against lower exposure levels of gases, vapors, liquids, and particulates as compared to Class 2 ensembles and are intended for exposure levels below IDLH levels. Ensembles are evaluated for vapor and liquid integrity but with less stringent criteria as compared to Class 2 ensembles. Materials are tested for permeation resistance to selected chemical agent and toxic industrial chemicals at low concentrations consistent with the same levels used for evaluating CBRN APR; materials are also tested for viral penetration resistance and various physical properties to demonstrate adequate physical hazard resistance and durability for the intended use. Ensemble categories include single use and multiple use. Ensembles are tested for functionality.

Class 4 ensembles can be designed for use with CBRN SCBA, CBRN APR, or CBRN PAPR, though CBRN APR and CBRN PAPR are consistent with the use of this ensemble. The Class 4 ensemble is designed for protection against biological warfare agents and/or radiological particulates where the expected exposures are presented as light splashes, aerosols or particulates. Ensembles are evaluated for particle integrity and use criteria for judging how well surrogate particulate penetrates the ensemble during simulated use. Materials are evaluated for viral penetration resistance involving a surrogate microorganisms using the same testing specified in this standard (NFPA 1999). Materials are also evaluated for various physical properties to demonstrate physical hazard resistance and durability for the intended use. Ensemble categories include single use and multiple use. Ensembles are tested for functionality.
1.2.3 The purpose of this standard shall also be to establish a minimum level of protection for emergency services personnel from specified CBRN terrorism agents in liquid splash and particulate environments during CBRN terrorism incidents.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 01 11:49:36 EDT 2015

Committee Statement
Committee Statement: The Correlating Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1994. The current CBRN ensemble requirements in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in the scope, referenced test methods, definitions, design criteria, performance criteria, test methods, and appendix pertaining to CBRN[C]BRN requirements. A separate standard has been added to the appendix to indicate that CBRN requirements are addressed in NFPA 1994.

Ballot Results
This item has passed ballot
15 Eligible Voters
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions
Not Returned
Davis, James E.
Laton, Michael A.
Affirmative All
Allen, Jason L.
Corrado, Steven G.
Davis, Todd P.
Egan, William A.
Fitch, Patricia A.
Harris, David R.
Hendry, R. Williams E.
Henderlson, Barry L.
Lancaster, Walter C.
Lentzen, Helen E.
Mam, Philip C.
Patrick, Richard W.
Sollars, Jeff
This standard shall apply to the design, performance, testing, and certification of new emergency medical garments; emergency medical examination gloves; emergency medical helmets; emergency medical cleaning/utility gloves; emergency medical work gloves; emergency medical face protection devices; emergency medical facemasks; emergency medical face protection and footwear covers; care facility footwear; and single-use and multiple-use emergency protective ensembles, and shall apply to ensembles and ensemble elements for the additional CBRN protection from specified biological and radiological terrorism agents.
This standard shall not apply to protective clothing for chemical terrorism incidents as such requirements are specified in NFPA 1994, Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents.
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: Thu Sep 17 11:06:42 EDT 2015

Committee Statement
Committee Statement: The TC is updating the referenced NFPA standards and adding a new reference.

Response Message:

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

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Lewis, Philip C.
Patrick, Richard W.
Becker, Jeff

National Fire Protection Association Report
http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
First Revision No. 113-NFPA 1999-2015 [Section No. 2.3.1]

2.3.1

AATCC Publications.
American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.


Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 17 11:09:27 EDT 2015

Committee Statement
Committee Statement: The TC is updating AATCC standard edition dates, and adding a new referenced standard.
Response Message:

Ballot Results
This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Latan, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fitzmaurice, William A.
Freeman, Patricia A.
Harrs, David R.
Heard, W. William E.
Heckemer, Barry L.
Lancaster, W. B. C.
Lambert, Helen B.
Marti, Philip C.
Patria, Richard W.
Stuffle, Jeff

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
2.3.2 ANSI Publications.

American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036.


Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: (Not Specified)
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Sep 17 11:15:29 EDT 2015

Committee Statement

Committee Statement: The TC is updating ANSI standard edition dates.

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstain

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fillian, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadtler, Jeff

Submitter, aff.
2.3.3 The TC is also replacing the current Grip test (8.27) with the Torque test, and is now referencing ASTM F2961. The TC is updating the edition dates and titles of referenced ASTM standards. In some instances, the ASTM method was not yet published. Therefore a hybrid method was used that combined ISO 13287 with elements of the ASTM F2913 draft document.

This new method will be slightly different from what is currently being used in that:

1) preconditioning of the specimen and test surface is slightly different (scrub brush and detergent (ASTM) vs. light sanding and alcohol (ISO)
2) the actual reading is 0.1ms (ASTM) vs. avg 0.1-0.3ms (ISO)
3) lasts are slightly different (SATRA (ASTM) vs. EN (ISO))

This method is now being referenced in NFPA 1971. The TC is also replacing the current Slip test (8.19) with the Slip G-2 test. Currently, the slip test method is to use a 30° incline, a 500g force, and a 0.81ms time. The TC is also updating the edition dates and titles of referenced ASTM standards. In some instances, the ASTM method was not yet published. Therefore a hybrid method was used that combined ISO 13287 with elements of the ASTM F2913 draft document.

The TC is also replacing the current Slip test (8.19) with the Slip G-2 test, and is now referencing ASTM F2891. The current Slip test is very subjective and does not provide consistent results. It has been replaced in NFPA 1971 and 1983 and is in the process of being replaced in NFPA 1977.

Ballot Results
- This item has passed ballot
- 15 Eligible Voters
  - 2 Not Return
- Ballot Text No. 2015NFPA 1999-2015 [Section No. 2.3.3]
2.3.4

CENELEC, European Committee for Electrotechnical Standardization, (CEN, CENELEC,管理和 Centre, 17, Avenue Marnix 17, 8, 1000 Brussels, Belgium.

EN 420, General requirements for gloves, 2009.

EN 455-2, Medical gloves for single use — Part 2: Requirements and testing for physical properties, 2015.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Sep 17 12:01:46 EDT 2015

Committee Statement

Committee Statement: The TC is updating the referenced EN standards editions.
Response Message:

Ballot Results

This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Laron, Michael A.

Affirmative All
Allen, Jason L.
Crandall, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Hendel, W. William E.
Hickerson, Barry L.
Lancaster, Beth C.
Lancaster, Karen E.
May, Philip C.
Patrick, Richard W.
Sadler, Jeff
Committee Statement

Committee Statement: The TC is updating the referenced ISO standards titles and dates.

Response Message:

Public Input No. 39-NFPA 1999-2015 [Section No. 2.3.6]

Ballot Results

This item has passed ballot

16 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned:

Davis, James E.
Lanier, Michael A.

Affirmative All:

Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Hickerson, Barry L.
Lancaster, Beth C.
Larham, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadtler, Jeff

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 Sep 02 09:07:39 EDT 2015

ISO Publications.

International Organization for Standardization,
ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, 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 65, General requirements for bodies operating assessment and certification/registration of quality systems, 1996.
ISO/IEC 17021, Conformity assessment — Requirements for bodies providing audit and certification of management systems, 2011.
ISO 17025, General requirements for the competence of testing and calibration laboratories, 2005.
ISO 17065, Conformity assessment — Requirements for bodies certifying products, processes, and services, 2012.

3.3.11 CBRN. A modification to CBRN as used in this standard to indicate the CBRN protection provided by the CBRN requirements does not include chemical CBRN hazards, but only applies to biological agents and radiological particulates CBRN hazards. (See also 3.3.13 CBRN Terrorism Agents.)

3.3.12 *CBRN Barrier Layer. The part of a composite that is intended to provide a barrier of protection against CBRN terrorism agents.

Committee Statement

Committees Statement: The Correlating Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1994. The current CBRN assemble requirements in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in the scope, referenced test methods, definitions, design criteria, performance criteria, test methods, and appendix pertaining to CBRN[C]BRN requirements. Associated annex material also deleted to indicate that CBRN requirements are addressed in NFPA 1994.

Ballot Results

This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned: Davis, James E.
Laron, Michael A.

Affirmative All: Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Ficary, William A.
Freire, Patrice A.
Harts, David K.
Hendrick, L. William E.
Henderson, Barry L.
Lancaster, Scott C.
Lankes, Karen E.
Mills, Philip C.
Patrick, Richard W.
Sollence, Jeff
3.3.23 Emergency Medical [C]BRN Protective Ensemble.

An ensemble consisting of garment elements, glove elements, footwear elements, and a [C]BRN respirator that is certified to meet the requirements for protection from specific [C]BRN terrorism agents.

Committee Statement

The Correlating Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1994. The current [C]BRN ensemble requirements in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in the scope, referenced test methods, definitions, design criteria, performance criteria, test methods, and appendix pertaining to [C]BRN requirements. A separate statement has been added to the Annex in A.1.1.4 to indicate that [C]BRN requirements are addressed in NFPA 1994.

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Laton, Michael A.
Affirmative All
Allen, Jason L.
Corrado, Steven O.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Howell, R. William E.
Holmes, Barry L.
Lancaster, Beth C.
Larson, Karen E.
Manning, Philip C.
Patrick, Richard W.
Sofiec, Jeff
3.3.30 Emergency Medical Powered Air-Purifying Respirator

An element or item of an emergency medical protective ensemble designed and configured to provide respiratory protection to the wearer from airborne infectious diseases, to act as a barrier, and to provide limited physical protection to the wearer's head and neck.

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 Sep 02 11:42:16 EDT 2015

Committee Statement
Committee Statement: Specialized forms of respirator devices are needed to address protection from highly infectious diseases as may be used by first responders or first responders. For example, 42 CFR part 84 does not cover the barrier qualities of hoods used in powered air-purifying respirators. The proposed label, design, and performance requirements address occupational medical situation, respiratory protection and require a change in the scope of the standard that now provides establishment of respiratory protection requirements. The Technical Committee intends to make additional adjustments to the related appendix section A.1.3.6 for addressing the guidance on the selection of respiratory protective devices.

Ballot Results
This item has passed ballot
15 Eligible Voters
13 Affirmative All
2 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Camilo, Steven D.
Davis, Todd P.
Fitzoy, William A.
Freeman, Patricia A.
Harris, David R.
Hicks, W. William E.
Hill, Barry L.
Kanther, Beth C.
Lanterman, Karen E.
Mills, Philip C.
Patrick, Richard W.
Sadtler, Jeff

16 of 112 12/16/2015 2:25 PM
Face Protection Device.
An abbreviated term for emergency medical face protection device. (See also 3.3.26, Emergency Medical Eye and Face Protection Device.)
3.3.55 Interface Gasket.

A component of an ensemble or ensemble element that provides an interface using an elastomeric material.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 01 21:13:46 EDT 2015

Committee Statement

Committee Statement: Interface gaskets may be used on product to provide joints with eye/face protection devices or respirators or other ensemble elements with the garment. The nature of these materials require that separate requirements be developed, and an accompanying definition of interface gaskets is being added.

Response Message:

Public Input No. 67-NFPA 1999-2015 [New Section after 3.3.57]

Ballot Results

This item has passed ballot

15 Eligible Votes
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Davis, James E.
Laton, Michael A.
Affirmative All
Allen, Jason L.
Carrado, Steven D.
Davis, Todd P.
Fithian, William A.
Frezoules, Patrick A.
Harms, David R.
Hovest, R. William E.
Hickerson, Barry L.
Lancaster, Beth C.
Langan, Helen E.
Mine, Philip C.
Pattino, Richard W.
Smith, Jeff

Submitter, Jeff

National Fire Protection Association Report http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
3.3.54 Interface Component(s).

Any material, part, or subassembly used in the construction of the compliant product that provides limited protection to interface areas.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Sep 01 21:59:25 EDT 2015

Committee Statement

Committee Statement: The TC is making an editorial change.

Response Message:

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fitch, William A.
Freeman, Patricia A.
Harke, David R.
Heuett, B. William E.
Hodrowicz, Barry L.
Lancaster, Beth C.
Lanham, Karen E.
Miskin, Philip C.
Patrick, Richard W.
Sadtler, Jeff

Committee Assistant

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
3.3.87 Visor Material.
The transparent material that allows the wearer to see outside the protective garment hood.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 02 15:44:31 EDT 2015

Committee Statement
Committee Statement: The TC is adding a definition for visor material, since a proposed test for visors is being added to Chapter 8, which is based on the requirements of ANSI Z87.1.

Response Message:

Ballot Results
This item has passed ballot
15 Eligible Voters
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Doss, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Hendrick, K. William E.
Hinkleman, Barry L.
Lancaster, Beth C.
Larson, Karen E.
Mann, Philip C.
Patrick, Richard M.
Saffier, Jeff
4.1.3
All certification shall be performed by a certification organization that meets at least the requirements specified in Section 4.2, Certification Program, and that is accredited for personal protective equipment (PPE) in accordance with ISO 65, General requirements for bodies operating product certification systems; ISO 17065, Conformity assessment — Requirements for bodies certifying products, processes, and services; and 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: Wed Sep 02 15:35:38 EDT 2015

Committee Statement
Committee Statement: The TC is updating this paragraph to include a new reference document.

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

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harms, David R.
Heard, W. William E.
HulchildNodes, Barry L.
Lancaster, Bert C.
Laing, Karen E.
Miller, Philip C.
Patrick, Richard W.
Stoller, Jeff
4.1.9 The certification organization shall not issue any new certifications to the 2008 edition of this standard on or after the NFPA effective date for the 2013 edition, which is December 17, 2012 [effective date to be added pending Standards Council determination].

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 Sep 01 14:09:08 EDT 2015

Committee Statement
Committee Statement: The TC is updating the effective date for the new edition.
Response Message:

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

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fitch, William A.
Frecon, Patricia A.
Harms, David R.
Haskell, III, William E.
Henderson, Barry L.
Lancaster, Beth C.
Laton, Karen E.
Meno, Philip C.
Patrik, Richard W.
Shaffer, Jeff

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
4.1.10 The certification organization shall not permit any manufacturer to continue to label any protective clothing items that are certified as compliant with the 2008 edition of this standard on or after June 30, 2013.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Sep 01 14:12:28 EDT 2015

Committee Statement
Committee Statement: The TC is updating the effective date for the new edition.
Response Message:

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

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Frederick, Patricia A.
Harris, David R.
Haskell, III, William E.
Hickerson, Barry L.
Lancaster, Beth C.
Larson, Karen E.
Lehtonen, Karen E.
Patrick, Richard W.
Saflor, Jeff
4.1.11

The certification organization shall require manufacturers to remove all certification labels and product labels indicating compliance with the 2008 edition of this standard from all protective ensembles and ensemble elements that are under the control of the manufacturer on June 30, 2013 [effective date plus 12 months to be added pending Standards Council determination], and the certification organization shall verify that this action is taken.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 01 14:16:01 EDT 2015

Committee Statement

Committee Statement: The TC is updating the effective date for the new edition.

Response Message:

Ballot Results

This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Absent

Not Returned
Davis, James E.
Larzar, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Stephen E.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Hickerson, Barry L.
Lancaster, Beth C.
Lepeska, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadtler, Jeff
4.2.3 The certification organization shall be accredited for PPE in accordance with ISO 65, General requirements for bodies operating product certification systems, and ISO 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: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submittal Date: Wed Sep 02 15:37:23 EDT 2015

Committee Statement

Committee Statement: The TC is updating this paragraph to include a new reference document.

Response Message:

Ballot Results

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

Not Returned:
Davis, James E.
Lanz, Michael A.

Affirmative All:
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Hendrick, Bill E.
Hinkley, Barry L.
Larson, Beth C.
Larson, Karen E.
Miller, Philip C.
Patrick, Richard W.
Sadler, Jeff

Committee Statement: The TC is updating this paragraph to include a new reference document.
Testing to all performance requirements as required by this standard on all manufacturer models and components.

(a) When a test method incorporates testing both before and after the laundering (e.g., 8.1.2) and the test generates quantitative results, recertification testing shall be limited to the conditioning that yielded the worst case test result during the initial certification for the model or component.

(b) When a test method requires the testing on three specimens, a minimum of one specimen shall be tested for annual recertification.

(c) Where a test method incorporates testing both before and after the laundering (e.g., 8.1.2) and the test generates qualitative results, recertification shall be limited to a single conditioning procedure in any given year. Subsequent annual recertifications shall cycle through the remaining conditioning procedures to ensure that all required conditions are included over time.

Annual recertification encompassing all performance requirements as required by this standard on all manufacturer models and components within the following protocol:

Testing to all design requirements as required by this standard on all manufacturer models and components.

Testing to all manufacturer models and components.

Testing to all performance requirements as required by this standard on all manufacturer models and components.

Testing to all performance requirements as required by this standard on all manufacturer models and components.

Testing to all performance requirements as required by this standard on all manufacturer models and components.

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Testing to all performance requirements as required by this standard on all manufacturer models and components.

Testing to all performance requirements as required by this standard on all manufacturer models and components.

Testing to all performance requirements as required by this standard on all manufacturer models and components.
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<th>Test/Section Number</th>
<th>Time</th>
<th>Samples for Certification</th>
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<td>Overall Ensemble Liquid Penetration Test (8.35)</td>
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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 Sep 01 12:30:00 EDT 2015

**Committee Statement**

Committee Statement: The Correlating Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1994. The current CBRN requirements in NFPA 1999 will be moved to NFPA 1994 as a suggested Class 4. Proposed changes to NFPA 1999 remove all language in the scope, referenced test methods, definitions, design criteria, performance criteria, test methods, and appendices pertaining to CBRN requirements. A separate statement has been added to the Annex A.1.4 to indicate that CBRN requirements will be addressed in NFPA 1994. The CBRN testing requirements were therefore deleted from Table 4.4.1. This table has been revised to incorporate testing requirements for single and multiple-use emergency medical protective ensembles.

**Response Message**

Ballot Results

- **This item has passed ballot**
- **15 Eligible Voters**
- 2 Not Returned
- 13 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstentions
- 0 Not Returned
- Allen, Jason L.
- Cantara, Steven G.
- Davis, Todd P.
- Finner, William A.
- Finner, Patrick A.
- Harris, David R.
- Hudson, B. William E.
- Hinkleman, Don L.
- Lambert, Mark C.
- Laribee, Ken E.
- Martin, Philip C.
- Patrick, Richard W.
- Sullivan, Jeff

**National Fire Protection Association Report**

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
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<td>Annual</td>
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<td>8.39</td>
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<tr>
<td>Design Requirements (6.4)</td>
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<td>Puncture Resistance Test One (8.13)</td>
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<tr>
<td>Slip Resistance Test (8.20)</td>
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<td>Footwear</td>
<td></td>
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<td>Eyelet and Stud Post Attachment Test (8.21)</td>
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<td>Footwear or footwear composite swatches</td>
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<tr>
<td>Overall Liquid Integrity Test Four (8.23)</td>
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<td>Footwear</td>
<td></td>
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<td>Label Durability and Legibility Test (8.33)</td>
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<td>Label Durability and Legibility Test (8.33)</td>
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**Multiple-use emergency medical helmets**

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<tr>
<th>Test Description</th>
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<td>Suspension System Retention Test (8.40)</td>
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<td>Retention System Test (8.41)</td>
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<td>Goggle and Headlamp Clip Attachment Test (8.42)</td>
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<table>
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<td>Complete ensembles</td>
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<td>Emergency Medical Footwear Requirements</td>
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<td>See above</td>
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<tr>
<td>Multiple-Use Emergency Medical Work Glove Requirements</td>
<td>Annual</td>
<td>See above</td>
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<td>Design Requirements (6.7)</td>
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<td>Single-Use Emergency Medical Garment Requirements</td>
<td>Annual</td>
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<td>Single-Use Emergency Medical Examination Glove Requirements</td>
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<td>Emergency Medical Footwear Requirements</td>
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<td>Emergency Medical Eye and Face Protection Device Requirements</td>
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<td>Emergency Medical Glove Requirements</td>
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<td>Emergency Medical Footwear Requirements</td>
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<tr>
<td></td>
<td>Emergency Medical Eye and Face Protection Device Requirements</td>
<td>Annual</td>
</tr>
</tbody>
</table>
NFPA 1999

4.4.1
All individual elements of the protective ensemble that are labeled as being compliant with this standard shall undergo recertification on an annual basis. *(See Table 4.4.1.)* This recertification shall include the following:

1. Inspection and evaluation to all design requirements as required by this standard on all manufacturer models and components
2. Testing to all performance requirements as required by this standard on all manufacturer models and components within the following protocol:

   a. Where a test method incorporates testing both before and after the laundering condition specified in 8.1.3 and the test generates quantitative results, recertification testing shall be limited to the conditioning that yielded the worst case test result during the initial certification for the model or component.

   b. Where a test method incorporates testing both before and after the laundering condition specified in 8.1.3 and the test generates nonquantitative results, recertifications shall be limited to a single conditioning procedure in any given year. Subsequent annual recertifications shall cycle through the remaining conditioning procedures to ensure that all required conditionings are included over time.

   c. Where a test method requires the testing on three specimens, a minimum of one specimen shall be tested for annual recertification.

   d. Where a test method requires the testing of five or more specimens, a minimum of two specimens shall be tested for annual recertification.

Table 4.4.1 Initial Certification and Annual Recertification
5.1.2.1 Each garment shall have a product label or labels permanently and conspicuously located inside each garment when the garment is properly assembled with all layers and components in place.

5.1.2.2 The product label shall have the certification organization's label, symbol, or identifying mark and at least the following statement legibly printed on the product label:

"THIS GARMENT or ENSEMBLE IS FOR SINGLE USE ONLY! THIS GARMENT or ENSEMBLE MEETS THE SINGLE-USE EMERGENCY MEDICAL REQUIREMENTS OF NFPA 1999, STANDARD ON PROTECTIVE CLOTHING AND ENSEMBLES FOR EMERGENCY MEDICAL OPERATIONS, 2013 EDITION. DO NOT REMOVE THIS LABEL!"

5.1.2.3 The following information shall also be printed legibly on the product label:

1. Manufacturer's name, identification, or designation
2. Manufacturer's address
3. Country of manufacture
4. Garment model and style
5. Trace number
6. Materials of construction
7. Month and year of manufacture, not coded
8. Size

5.1.2.4 Where the garment is certified as part of a single-use emergency medical protective ensemble, the following additional language shall be provided:

"TO PROVIDE FULL BODY PROTECTION, THE FOLLOWING ADDITIONAL ITEMS MUST BE WORN AS PART OF THIS ENSEMBLE:"

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 01 17:48:07 EDT 2015

Committee Statement
Committee Statement: TIA 13-1 incorporated ensemble requirements to address the specific needs of protective against hazardous of highly infectious airborne and liquidborne pathogens. For expediency, these new requirements were added to the single-use and multiple-use garment sections of the standard. These proposed changes delete the ensemble requirements from the respective garment sections and create new sections specifically for each type of ensemble in separate bills. These changes permit making additional changes in order to audit for specific ensemble requirements such as addressing interface gaskets and other issues for controlling elements and separate equipment. The proposed changes also highlight that the standard separately addresses ensemble requirements.

Response Message:
Ballot Results
This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention
Not Returned
Davis, James E.
Laton, Michael A.
Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Hickerson, Barry L.
Lancaster, Beth C.
Larson, Kevin E.
Melnik, Philip C.
Patrick, Richard II.
Stoller, Jeff
5.1.3 Multiple-Use Emergency Medical Protective Garment and Ensemble Product Label Requirements.

5.1.3.1 Each garment shall have a product label or labels permanently and conspicuously located inside each garment when the garment is properly assembled with all layers and components in place.

5.1.3.2 The product label shall have the certification organization's label, symbol, or identifying mark and at least the following statement legibly printed on the product label:

"THIS [insert the term GARMENT or ENSEMBLE here] MEETS THE MULTIPLE-USE EMERGENCY MEDICAL [insert the term GARMENT or ENSEMBLE here] REQUIREMENTS OF NFPA 1999, STANDARD ON PROTECTIVE CLOTHING AND ENSEMBLES FOR EMERGENCY MEDICAL OPERATIONS, 2013 EDITION. DO NOT REMOVE THIS LABEL!"

5.1.3.3 The following information shall also be printed legibly on the product label:

1. Manufacturer's name, identification, or designation
2. Manufacturer's address
3. Country of manufacture
4. Garment model or style
5. Trace number
6. Materials of construction
7. Cleaning precautions
8. Month and year of manufacture, not coded
9. Size

5.1.3.4 Where visibility materials are used on garments and the garment meets the requirements of ANSI/ISEA 107, High-Visibility Safety Apparel and Headwear, the product label shall also meet the marking information required by ANSI/ISEA 107.

5.1.3.5 Where visibility materials are used on garments and are not intended to meet the requirements in ANSI/ISEA 107, High-Visibility Safety Apparel and Headwear, the product label shall include the following warning:

"WEARING OF THIS GARMENT ALONG ROADSIDES OR OTHER AREAS WITH VEHICULAR TRAFFIC REQUIRES ADDITIONAL HIGH VISIBILITY SAFETY APPAREL, COMPLIANT WITH AT LEAST THE CLASS 2 REQUIREMENTS OF ANSI/ISEA 107."

5.1.3.6 Where the garment is certified as part of a multiple-use emergency medical protective ensemble, the following additional language shall be provided:

"TO PROVIDE FULL BODY PROTECTION, THE FOLLOWING ADDITIONAL ITEMS MUST BE WORN AS PART OF THIS ENSEMBLE.

[list items including manufacturer name and model or style number.]"

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 01 17:52:17 EDT 2015

Committee Statement

Committee Statement:

TIA 13-1 incorporated ensemble requirements to address the specific needs of protection against hazardous of highly infectious airborne and liquidborne pathogens. For existing single-use garments, the ensemble requirements are added to according to the ensembles in the multi-use garment sections of the standard. The proposed changes delete the ensemble requirements from the respective garment sections and create new sections specifically for each type of ensemble in separate systems. These changes are not intended to address any specific ensemble requirements into address the interface gaskets and other issues for combining elements and separate equipment. The proposed changes also highlight that the standard separately addresses ensemble requirements.

Ballot Results

This item has passed ballot

15 Eligible Votes
2 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstain

Voters:
Gise, James E.
Lamb, Michael A.
Affirmative All
Wex, Jean L.
Corrado, Steven D.
Gise, Ted P.
Fillan, William A.
Freier, Patricia A.
Harr, David A.
Hewish, B. William II.
Hitchings, Barry L.
Lancaster, Seth C.
Lehman, Robert E.
Milen, Philip C.
Patrick, Richard W.
Stobbe, Jeff

Not Returned:
Gise, James E.
Lamb, Michael A.

Affirmative All:
Wex, Jean L.
Corrado, Steven D.
Gise, Ted P.
Fillan, William A.
Freier, Patricia A.
Harr, David A.
Hewish, B. William II.
Hitchings, Barry L.
Lancaster, Seth C.
Lehman, Robert E.
Milen, Philip C.
Patrick, Richard W.
Stobbe, Jeff
5.1.14 Emergency Medical Powered Air-Purifying Respirator Product Label Requirements.

5.1.14.1 The package containing the smallest number of powered air-purifying respirator items from which the user withdraws the product for use shall have a package product label.

5.1.14.2 The certification organization's label, symbol, or identifying mark and at least the following statement shall be printed on the package product label:

"THIS RESPIRATOR MEETS THE MULTIPLE-USE EMERGENCY MEDICAL EYE AND FACE PROTECTION REQUIREMENTS OF NFPA 1999, STANDARD ON PROTECTIVE CLOTHING AND ENSEMBLES FOR EMERGENCY MEDICAL OPERATIONS, 2018 EDITION. DO NOT REMOVE THIS LABEL!"

5.1.14.3 The following information also shall be printed legibly on the package product label:

1. Manufacturer's name, identification, or designation
2. Manufacturer's address
3. Country of manufacture
4. Respirator model or style
5. Trace number
6. Materials of construction
7. Cleaning precautions
8. Month and year of manufacture, not coded
9. Size

5.1.14.4 Each respirator shall have a product label, in addition to the required package product label, placed in a conspicuous location on the respirator that shall not interfere with the wearer's vision.

5.1.14.5 The certification organization's label, symbol, or identifying mark and at least the following statement shall be legibly printed on the product label of each respirator:

"MEETS NFPA 1999, 2018 ED.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submit Date: Wed Sep 02 11:46:27 EDT 2015

Committee Statement

Committee Statement:

Specialized forms of respirator devices are needed to address protection from highly infectious diseases as they may be used by first responders at first responders. For example, 42 CFR part 84 does not cover the barrier qualities of hoods used in powered air-purifying respirators. The proposed label, design, and performance requirements address emergency, medical powered air-purifying respirators and require a change in the scope of the standard that may preclude establishment of respiratory protection requirements. The Technical Committee intends to make additional adjustments in the related appendix section.

Response Message:

Ballot Results

This item has passed ballot

15 Affirmative Votes
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Negative

Not Returned: Davis, James E.
Affirmative All: Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Freeman, Patricia A.
Harris, David R.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadler, Jeff

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submit Date: Wed Sep 02 11:46:27 EDT 2015

Committee Statement

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Response Message:

Ballot Results

This item has passed ballot

15 Affirmative Votes
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Negative

Not Returned: Davis, James E.
Affirmative All: Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Freeman, Patricia A.
Harris, David R.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadler, Jeff

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submit Date: Wed Sep 02 11:46:27 EDT 2015

Committee Statement

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Specialized forms of respirator devices are needed to address protection from highly infectious diseases as they may be used by first responders at first responders. For example, 42 CFR part 84 does not cover the barrier qualities of hoods used in powered air-purifying respirators. The proposed label, design, and performance requirements address emergency, medical powered air-purifying respirators and require a change in the scope of the standard that may preclude establishment of respiratory protection requirements. The Technical Committee intends to make additional adjustments in the related appendix section.

Response Message:

Ballot Results

This item has passed ballot

15 Affirmative Votes
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Negative

Not Returned: Davis, James E.
Affirmative All: Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Freeman, Patricia A.
Harris, David R.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadler, Jeff

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submit Date: Wed Sep 02 11:46:27 EDT 2015
Multiple Use Emergency Medical Protective Ensemble Product Labeling Requirements

5.1.15.1

The product label shall have the certification organization's label, symbol, or identifying mark and at least the following statement legibly printed on the product label:

The appropriate term for the element type — garment, glove, footwear, or interface component — shall be inserted in the compliance statement text where indicated in this section.

5.1.15.2

The following additional language shall be provided on the product label:

WHERE VISIBILITY MATERIALS ARE USED ON GARMENTS AND ARE NOT INTENDED TO MEET THE REQUIREMENTS IN ANSI/ISEA 107, THE PRODUCT LABEL SHALL INCLUDE THE FOLLOWING STATEMENT:

“THIS EMSEMBLE REQUIRES VISIBILITY APPAREL, COMPLIANT WITH AT LEAST THE CLASS 2 REQUIREMENTS OF ANSI/ISEA 107.”

5.1.15.3

The product label shall also meet the marking information required by ANSI/ISEA 107.

5.1.15.4

The garment element portion of the ensemble meeting the requirements for protection against CBRN terrorism agents shall list those items of the certified ensemble by manufacturer name and model number on the product label.

5.1.15.5

The following information shall also be printed legibly on the product label:

- Manufacturer's name, identification, or designation
- Country of manufacture
- Size
- Ensemble model and style
- Cleaning precautions
- Date and year of manufacture, not coded
- Certification organization's label, symbol, or identifying mark
- Other than the term "CBRN Protective Ensemble," all product label letters and figures shall be at least 2.5 mm (0.1 in.) in height.

5.1.15.6

The Configure Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1994. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address: [Not Specified]
City: [Not Specified]
State: [Not Specified]
Zip: [Not Specified]
Submit Date: [Not Specified]

Committee Statement
Committee: The Correlating Committee has asked the Technical Committee with CBRN requirements to move those requirements to NFPA 1994. The current CBRN ensemble requirements in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in NFPA 1999 will be moved to NFPA 1994 as a ruggedized Class 4. Proposed changes to NFPA 1999 remove all language in

Ballot Results
- This item has passed ballot
- 15 Eligible Voters
- 2 Not Returned
- 12 Affirmative
- 0 In Favor of Comments
- 0 Negative of Comments
- 0 Abstentions

Not Returned
Doe, James E.
Latom, Michael A.
Affirmative All
Allen, Jason L.
Corrado, Steven D.
Doe, Todd P.
Fifikas, William A.
Frances, Patricia A.
Harris, David R.
Hosford, B. William E.
Horton, Barry L.
Lancaster, Beth C.
Larson, Karen E.
Leiden, Philip C.
Patterson, Richard W.
Squier, Jeff

33 of 112

12/16/2015 2:25 PM
5.2.2 For protective ensembles, or protective ensembles certified to the CBRN requirements, the manufacturer shall provide the following additional instruction and information with each ensemble:

- A statement that only the ensemble and the specific items with which the ensemble has been certified must be worn together to ensure that protection is provided.
- A list of the specific items and interface components that must be worn as part of the ensemble, including each type of NIOSH APR, PAPR, or SCBA, or approved breathing system(s) that the ensemble has been certified with.
- Specific limitations associated with the use of the ensemble for a response involving biological threats or CBRN threats, including, but not limited to, a statement that protection against radiological and nuclear hazards is limited to particulates only.
- Specific care and maintenance provisions associated with systems maintaining the unique performance properties of the ensemble.
- A statement that if the ensemble is used in an emergency involving biological or CBRN hazards that the ensemble be retired from use and not be further used.

Committee Statement

The Correlating Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1994. The current CBRN ensemble requirements in NFPA 1999 will be moved to NFPA 1994 as a suggested Class 4. Proposed changes to NFPA 1999 remove all language in the scope, referenced test methods, definitions, design criteria, performance criteria, test methods, and appendix related to CBRN requirements. A separate standard has been added to the appendix to indicate that CBRN requirements are addressed in NFPA 1994.
5.2.2* For single-use or multiple-use protective ensembles, the following additional instructions and information shall be provided:

(1) The specific sequence and requirements for donning each item of the ensemble.

(2) Specifically recommended methods for cleaning each element where elements are combined or attached.

(3) The specific sequence, precautions, and requirements for decontamination to be employed during the doffing of ensemble elements.

(4) Specific considerations for decontamination to be employed during the doffing of ensemble elements, when contaminated with body fluids, for the avoidance of cross-contamination of the individual wearer, other ensemble items, and the outside environment.

Additional guidance is needed for providing organizations information on the use of ensembles specifically as to the efficiency of specific decontamination procedures and how contaminated clothing can be removed without transfer of contaminant to the wearer. The proposed Annex language offers preliminary guidance in both of these areas.

Supplemental Information

File Name: FR-25_A.5.2.3_4_-_5_.docx

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 Sep 01 15:05:33 EDT 2015

Committee Statement

Committee Statement:
The TC believes that tape should not be allowed since there are no standardized methods for taping and the risk of contamination during doffing.

Response Message:
Public Input No. 71-NFPA 1999-2015 [Section No. 5.2.3]

Ballot Results

This item has passed ballot

15 Eligible Voters
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Hickerson, Barry L.
Haskell, III, William E.
Hucko, Barry E.
LaBotz, Robert W.
LaRosa, Karen E.
Laton, Michael A.
Patrick, Richard W.
Peters, Richard H.
Sadtler, Jeff
A.5.2.3(4) The specific considerations for decontamination provided by the manufacturer should account the effects of decontamination agents on the ensemble material as these agents may be applied during the doffing process both in terms of any immediate degradation that results in exposure of the wearer or from repeated use of decontamination agents on the ensemble element that compromises the continued service of multiple-use ensemble items. The immediate effects of degradation may be determined by applying the permeation procedures specified in 8.24, Chemical Permeation Resistance Test, where specimens of ensemble materials are exposed to selected decontamination or disinfection agents for a period of 1 hour with the measurement of cumulative permeation. These procedures are currently only applied to single-use emergency medical cleaning gloves. The procedures may be adapted as a precondition using suitable and anticipated decontamination agents followed by biopenetration resistance testing specified in Section 8.3, or the assessment of material physical properties as specified for the individual ensemble element. For example, the burst strength and puncture propagation tear resistance of a garment material (specified in Sections 8.5 and 8.6, respectively) can be applied both before and after a 1-hour exposure to bleach (5% w/w sodium hypochlorite solution in water) to determine if any physical degradation of the garment may take place.

A.5.2.3(5) Contamination of the wearer during the doffing process is a significant hazard that is not readily detected. It is recognized that each organization that utilized protective ensembles for the protection of their personnel may have unique donning and doffing procedures based on their specific operational or clinical practices. To assess whether the doffing procedures have been adequately designed for limit cross contamination, the following practices are recommended:

(a) The wearer must assume than any surface could be contaminated.

(b) All doffing must be performed under supervision and with assistance as needed. Individuals supervising or assisting in the decontamination of potentially contaminated personnel should be wearing appropriate protective clothing.

(c) The last items to be removed should the face/eye protection or respirator, and inner gloves.

(d) Any time the wearer of the contaminated ensemble or an individual assisting in the doffing process touches a potentially contaminated surface or PPE item, the wearer or assisting individual must rinse their gloved hands with an appropriate decontamination solution that does not cause degradation of the gloves.

(e) For some types of ensembles, it is possible to cut off the garment to permit easier doffing without contact with contaminated surfaces. If cutting of the garment is performed, then the procedures used for the cutting process should account for the design of the garment (e.g., the placement of seams and closures).

The specific effectiveness of these procedures can be determined by a practical test where a fluorescently tagged agent acting as a surrogate for contaminated body fluids is applied to
exterior of the ensemble in areas of likely contamination with a test subject undertaking specified manufacturer’s or organization’s doffing procedures. The use of fluorescent like of the test subject following the doffing process can qualitatively determine if any contamination transfer has taken place to the wearer. Examples of specific procedures applied for this type of assessment can be found in the following literature:


5.3 Technical Data Package.

5.3.1 The manufacturer shall furnish a technical data package for single-use or multiple-use protective ensembles and ensemble elements upon the request of the purchaser.

5.3.2 The technical data package shall contain the values obtained from the initial certification testing showing compliance with the requirements of Chapter 7 in the current edition of this standard. This information shall be provided in the format of a table.

5.3.3 In the technical data package, the manufacturer shall describe the single-use or multiple-use protective ensembles and ensemble elements in terms of manufacturer's trade name and model number, manufacturer replaceable components, available options, accessories, testing devices, and sizes.

5.3.4 In the technical data package, the manufacturer shall describe the available sizes of the single-use or multiple-use protective ensemble and ensemble elements.

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 Sep 01 15:28:27 EDT 2015

Committee Statement

Committee Statement: The purchaser will be provided with the technical information necessary to make an informed buying decision. This revision brings NFPA 1999 in line with standards NFPA 1994 and NFPA 1991.

Response Message:

Ballot Results

This item has passed ballot

15 Eligible Voters
12 Affirmative All
1 Negative with Comments

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Caumo, Steven G.
Davis, Todd P.
Fryar, William A.
Harris, David R.
Heward, B. William B.
Hickerson, Barry L.
Lancaster, Scott C.
Lahteenmaki, Don E.
Mann, Philip C.
Patrick, Richard W.
Sadtler, Jeff

Negative with Comment
Freeman, Patricia A.

I have no objection to providing information to an end user and believe they are certainly entitled to receive it if they request it. As a consultant, I would think twice about doing business with any company that was NOT willing to share technical data. However, requiring a Technical Data Package be available upon request adds unnecessary expense to the manufacturer and the certification process. This requirement is found in NFPA 1992 and has been moving towards being provided in Technical Data Package is an end user understanding what is a mandatory requirement, many and the certification agency has to review this documentation for accuracy and completeness to the standard. The Technical Committee for 1971 has taken a different tact and put a Technical Data Package as opposed to a mandatory requirement. The Technical Data Package is a tool available to the end user may find useful. One reason for the recommendations is that several requirements are simple pass/fail with no values assigned and it is obvious that if an element fails a requirement, it will not be certified and the data becomes moot. I would support a similar approach for NFPA 1990 and the ensemble elements, with an annex data that covers the technical data package as opposed to a mandatory requirement.

12/16/2015 2:25 PM
National Fire Protection Association Report
http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
6.1.1.2* Garments shall be permitted to be configured as full body clothing such as jackets and pants or coveralls, and non-full body clothing such as aprons, sleeve protectors, and hoods.

6.1.1.2.1 Where garments are configured as aprons, garments shall be designed to protect the front torso of the wearer from the neck to below the knees.

6.1.1.2.2 Where garments are configured as sleeve protectors, garments shall be designed to protect the arm of the wearer from the wrist crease to a distance of no less than 405 mm (16 in.) from the wrist crease.

6.1.1.2.3 Where garments are configured as sleeved aprons, garments shall be designed to protect the front torso of the wearer from the neck to below the knees and the arm of the wearer to the wrist crease.

6.1.1.2.4 Where garments are configured as separate hoods, garments shall be designed to protect the wearer at the top, side, and back of the wearer's head and the wearer's neck.

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 Sep 01 21:37:38 EDT 2015

Committee Statement
Committee Statement: The TC notes that hoods are a type of partial body garment that are not currently listed in the standard but can be considered a garment type for certification.

Response Message:
Public Input No. 63-NFPA 1999-2015 [Section No. 6.1.1.2]

Ballot Results
This item has passed ballot:
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fitch, William A.
Freeman, Patricia A.
Harris, David R.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadtler, Jeff

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
6.1.1.4.1 Where garments incorporate hoods, the hood shall cover at least the top, back, and sides of the head.

6.1.1.4.2 Where garments are configured as separate hoods, the hood shall cover at least the top, back, and sides of the head.

6.1.1.4.3 Where garments incorporate hoods or are provided as separate hoods, the hood shall be permitted to have a face opening that accommodates the wearing of specific eye and face protection devices or respirators.

6.1.1.4.4 Where garments incorporate hoods or are provided as separate hoods, the hood shall be permitted to include a clear visor that covers the wearer's eyes and face.
6.1.1.8 Where the garment is certified as part of a single-use emergency protective ensemble to meet the requirements of 7.1.1.1, the manufacturer shall specify the use of any NFPA 1999-certified single-use emergency medical protective gloves (2 pairs – inner and outer), specific emergency medical footwear or emergency medical footwear covers, specific eye and face protection devices, and specific filtering facepiece respirator.


6.1.1.8.2 If the garment is configured with a bootie that is constructed of garment material and covers the wearer's foot and ankle, then any footwear meeting ASTM F 2413, Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear, shall be permitted to be specified in conjunction with the garment.

6.1.1.8.3 Eye and face protection devices shall be permitted to include goggles and faceshields that only meet ANSI Z87.1, Occupational and Educational Personal Eye and Face Protection Devices, requirements when marked for splash/droplet use.

6.1.1.8.4 The filtering facepiece respirator shall be a NIOSH-approved filtering facepiece in accordance with Title 42, Code of Federal Regulations, Part 84, "Approval of Respiratory Protective Devices," that also meets the requirements of ASTM F 2100, Standard Specification for Performance of Materials Used in Medical Face Masks or a surgical N95 filtering facepiece respirator that is a NIOSH-approved N95 respirator that has also been cleared by the U.S. Food and Drug Administration as a surgical mask.

6.1.1.8.5 The manufacturer shall be permitted to specify respirators that meet the requirements in 6.1.2.9.2.

6.1.1.8.6 The use of a specific tape specified by the manufacturer shall be permitted for securing items in interface areas.
6.1.2.2 Garments shall be permitted to be configured as full body clothing such as jackets and pants or Coveralls® and non-full body clothing such as aprons, sleeve protectors, and hoods. (See A 6.1.2.2.)

6.1.2.2.1 Where garments are configured as aprons, garments shall be designed to protect the front torso of the wearer from the neck to below the knees.

6.1.2.2.2 Where garments are configured as sleeve protectors, garments shall be designed to protect the arm of the wearer from the wrist crease to a distance of no less than 405 mm (16 in.) from the wrist crease.

6.1.2.2.3 Where garments are configured as sleeved aprons, garments shall be designed to protect the front torso of the wearer from the neck to below the knees and the arms of the wearer to the wrist crease.

6.1.2.2.4 Where garments are configured as separate hoods, garments shall be designed to protect the wearer at the top, side, and back of the wearer’s head and the wearer’s neck.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 02 14:32:42 EDT 2015

Committee Statement
Committee Statement: The TC believes that hoods are a type of partial body garment that are not currently listed in the standard but can be considered a garment type for certification.

Response Message:
Public Input No. 64-NFPA 1999-2015 [Section No. 6.1.2.2]

Ballot Results
This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention
Not Returned
Davis, James E.
Laton, Michael A.
Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fishman, William A.
Freeman, Patricia A.
Harris, David R.
Hawkey, R. William E.
Hickerson, Barry L.
Lancaster, Bert C.
Larsen, Karen E.
Mallin, Philip C.
Patrick, Richard W.
Saffit, Jeff
Where garments incorporate hoods, the hood shall cover at least the top, back, and sides of the head.

Where garments are configured as separate hoods, the hood shall cover at least the top, back, and sides of the head.

Where garments incorporate hoods or are provided as separate hoods, the hood shall be permitted to have a face opening that accommodates the wearing of specific eye and face protection devices.

Where garments incorporate hoods or are provided as separate hoods, the hood shall be permitted to include a clear visor that covers the wearer's eyes and face.
6.1.2.9 Where the garment is certified as part of a multiple-use emergency protective ensemble to meet the requirements of 7.1.2.1, the manufacturer shall specify the use of specific emergency medical cleaning/utility or work gloves worn over any NFPA 1999-certified single-use medical emergency examination gloves, specific multiple-use emergency medical footwear, and specific full facepiece respirator(s).


6.1.2.9.2 If the garment is configured with a bootie that is constructed of garment material and covers the wearer’s foot and ankle, then any footwear meeting ASTM F 2413, Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear, shall be permitted to be specified in conjunction with the garment.

6.1.2.9.3 Full-face respirators shall be NIOSH approved as either a full-facepiece air-purifying respirator with minimum protection level of P100 or as a respirator built or assembled (N95 respirator comprised of a surgical mask and a protective level of HE). All respirators shall be approved in accordance with Title 42, Code of Federal Regulations, Part 84, “Approval of Respiratory Protective Devices.”

6.1.2.9.4 Where a loose-fitting powered air-purifying respirator is specified, the materials used in the construction of the hood shall meet the garment material performance requirements specified in either 7.1.1.1 with the exception of the requirement in 7.1.1.8, or 7.1.1.2 with the exception of 7.1.2.9.
6.2.3 Multiple-Use Emergency Medical Work Glove Design Requirements

6.2.3.1 Emergency medical work gloves shall be designed and designated to meet only the multiple-use requirements of this standard.

6.2.3.2 Emergency medical work gloves shall be designed and configured to provide physical and barrier protection to the wearer's hand from the fingertips to at least the wrist crease.

6.2.3.2.1 Emergency medical work gloves shall be permitted to include a separable liner or inner glove for the purpose of achieving the barrier protection function.

6.2.3.2.2 Emergency medical work gloves shall be permitted to use either a single-use emergency medical examination glove or a single-use emergency medical protective glove as the inner glove when designed to be part of a single-use or multiple-use emergency medical protective ensemble.

6.2.3.3 The glove shall consist of a glove body and an optional interface component.

6.2.3.3.1 The glove shall extend circumferentially from the tip of the fingers to the wrist crease.

6.2.3.3.2 The portion of the glove that extends from the tip of the fingers to the wrist crease shall be considered to be the glove body and shall meet the glove body requirements in 7.2.3.

6.2.3.3.3 The optional portion of the glove that extends from the wrist crease up to the end of the entire glove shall be considered to be the glove interface component and shall meet the glove interface component requirements in 7.2.3.

6.2.3.3.4 The glove shall be designed to fit closely around the wearer's wrist or shall be adjustable such that a close fit around the wearer's wrist can be achieved to restrict the entry of foreign particles.

6.2.3.3.5 The location of the wrist crease shall be determined by placing the glove palm down on a measurement board palm down and securing (locking) the fingertips down onto the board.

6.2.3.3.6 A 1 lb weight shall be attached to the end of the glove body or glove interface component. The weight shall not be attached to a knitted wristlet and shall be applied evenly across the glove.

6.2.3.3.7* Two points shall be marked on the back side of the glove. The location of the points shall be determined by measuring down the following distances according to glove size, from the finger crotch of digit two and from the finger crotch of digit three:

(1) XS: 9.46 cm (3.72 in.)
(2) S: 10.04 cm (3.95 in.)
(3) M: 10.68 cm (4.20 in.)
(4) L: 11.21 cm (4.42 in.)
(5) XL: 11.73 cm (4.62 in.)

6.2.3.3.8 A straight line shall be drawn on the back side of the glove using the two points. This line shall be drawn around the side edges of the glove.

6.2.3.3.9 The resulting straight line around the circumference of the glove shall be the location of the wrist crease.

6.2.3.4 Emergency medical work gloves shall have a wristlet or elastic that allows the glove material to fit closely around the wearer's wrist.

6.2.3.4 Hand dimensions for the selection of the proper emergency medical work glove size shall consist of measuring the hand circumference and hand length dimensions as shown in Figure 6.2.3.4.

Figure 6.2.3.4 Method of Measuring Hand Dimensions for Selection of Proper Glove Size.

6.2.3.4.1 Hand circumference shall be measured by placing a measuring tape on a table or other flat surface with the numerals facing downward. The subject shall place the right hand, palm down and fingers together in the middle of the tape so that the tape can pass straight across the metacarpal knuckles. The circumference shall be measured to the nearest 3 mm (1/8 in.) as shown in Figure 6.2.3.4.

6.2.3.4.2 Finger circumference shall be measured at the proximal interphalangeal joint, the first knuckle. Finger length shall be measured from the tip of the finger to the base of the finger crease on the palm side.

6.2.3.4.3 Hand dimensions for the selection of the proper emergency medical work glove size shall consist of measuring the hand circumference and hand length dimensions as shown in Figure 6.2.3.4.
### Table 6.2.3.5(d)

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<td>5.63–6.74</td>
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### Table 6.2.3.5(e)

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<tbody>
<tr>
<td>Small (S)</td>
<td>17.25–18.25</td>
<td>5.63–6.74</td>
<td>3.76</td>
<td>2.86–2.96</td>
<td>2.28–2.72</td>
<td>8.44</td>
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### Table 6.2.3.5(f)

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<th>Size</th>
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<th>Digit 4 Circumference</th>
<th>Digit 5 Circumference</th>
<th>Mid-Size Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small (S)</td>
<td>17.25–18.25</td>
<td>5.63–6.74</td>
<td>3.76</td>
<td>2.86–2.96</td>
<td>2.28–2.72</td>
<td>8.44</td>
</tr>
</tbody>
</table>

### Queries

- **Submitter Information**
  - **Submitter Full Name**: Dave Trebisacci
  - **Organization**: Not Specified
  - **Street Address**:
  - **City**:
  - **State**:
  - **Zip**:
  - **Submitter Email**:
  - **Submitter Phone**:
  - **Submitter Fax**:
  - **Submitter Contact**:
  - **Submitter Date**: Wed Aug 02 09:21:42 EDT 2015

- **Committee Statement**
  - **Committee Statement**: This text was revised in the latest edition and new further clarifications are needed in order not to be design restrictive. A glove may not have a traditional interface component in order to fit closely to the wearer's wrist. The new wording is similar to the wording used in NFPA 1971. The TC will also continue to research other sizing options.
  - **Additional flexibility is needed to permit the design of durable gloves for use with ensembles where gloves may be temporarily or permanently attached to the garment sleeve portion of full ensembles. The proposed changes provide for an outer glove that provides rugged physical performance and covers an inner glove or liner that offers the barrier protection against biological hazards.**
  - **Response Message**:

- **Ballot Results**
  - **This item has passed ballot**
  - **13 Affirmative All**
  - **2 Not Returned**

- **Range to Be Accommodated**
  - **Range for Hand Circumference:** 7.97–8.91
  - **Range for Hand Length:** 5.60–6.75
  - **Range for Hand Circumference:** 5.87
  - **Range for Hand Circumference:** 5.69
  - **Range for Hand Circumference:** 17.25–21.25
  - **Range for Hand Circumference:** 16.25–17.25
  - **Range for Hand Circumference:** 20.25–21.25

- **Key permanent attachment provided by the manufacturer to a work glove shall not interfere with the function of that work glove or with the function of any of the work glove component parts.**

- **Where work gloves are provided by the manufacturer with permanent attachments, the work gloves shall meet all of the design and performance requirements of the standard with permanent attachments installed. In all cases, such permanent attachments shall not degrade the performance of the work glove.**
6.6 Emergency Medical Powered Air-Purifying Respirator Design Requirements.

6.6.1 The respirator shall be certified to the requirements of Title 42, CFR 84, “Approval of Respirator Protective Devices,” and shall include a protection level of HE.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
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Street Address: [Not Specified]
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State: [Not Specified]
Zip: [Not Specified]
Submittal Date: Wed Sep 02 11:48:39 EDT 2015

Committee Statement
Committee Statement:
Specialized forms of respiratory devices are needed to address protection from highly infectious diseases as may be used by front responders or first responders. For example, 42 CFR part 84 does not cover the barrier qualities of hoods used in powered air-purifying respirators. The proposed label, design, and performance requirements address emergency medical powered air-purifying respirators and require a change in the scope of the standard that now predates establishment of respiratory protection requirements. The Technical Committee intends to make additional adjustments or move to address the guidance on the selection of respiratory protective devices.

Response Message
Ballot Results
This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Davis, James E.
Larsen, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harms, David K.
Heavilin, William E.
Hunnicutt, Barry L.
Lancaster, Beth C.
Lehrnbecher, Karen E.
Moles, Philip C.
Patrick, Richard W.

Not Returned
http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

If the ensemble is specified with multiple-use emergency medical work gloves and the work glove design relies on either a separable liner that is attached to a specific single-use medical examination glove for the barrier protection, or the work glove consists of a separable liner that is attached to the outer surface of the medical examination glove, then two separate and distinct sizes shall be provided to meet the requirements of Section 7.4.5.1.9. (A)


eighteen polyvinylidene chloride (PVDF) or its resin polymer(s).

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.

Emergency medical protective footwear shall be permitted to include any footwear certified to ANSI Z49.1, NIOSH, NFPA, or NFPA-1994. If the ensemble garment is configured with booties that are constructed of garment material and cover the wearer’s foot and ankle, then any footwear meeting ASTM F2413 shall be permitted to be specified in conjunction with the garment.

The use of a specific type of footwear specified by the manufacturer shall be permitted for ensuring wearer comfort in interface areas.
A.6.7.1 See A.3.3.79, Single-Use Emergency Medical Protective Ensemble.

A.6.7.1.3 Multiple-use emergency medical eye and face protective devices are already required to meet the respective requirements of ANSI Z87.1, *Occupational and Educational Personal Eye and Face Protection Devices*. The ANSI Z87.1 standard already includes criteria that address other areas of performance such as ignition and droplet/splash protection. Goggles and faceshields meeting these requirements are marked for splash/droplet use using the “D3” marking.


A.6.7.1.6 Tape is permitted only where the manufacturer identifies a specific tape, where the tape is used to secure interface areas and the tape does not serve as the primary liquid or viral penetration resistance barrier, and the manufacturer provides detailed instructions for its application as part of the required user information.

A.6.8.1 See A.3.3.64, Multiple-Use Emergency Medical Protective Ensemble.
7.1.1.1 Full body or full torso garments, including, but not limited to, ensembles, coveralls, coats, jackets, pants, and overalls, shall be tested for liquidtight integrity as specified in Section 8.2, Liquidtight Integrity Test One, and shall allow no water penetration.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address: 
City: 
State: 
Zip: 
Submit Date: Tue Sep 01 18:09:48 EDT 2015

Committee Statement
Committee Statement: TIA 13-1 incorporated ensemble requirements to address the specific needs of protection against hazardous of highly acidic outcome and liquidborne pathogens. For expediency, these new requirements were added to the single-use and multiple-use garments sections of the standard. These proposed changes delete the ensemble requirements from the respective garment sections and create new sections specifically for each type of ensemble in separate levels. These changes permit making additional changes to account for specific ensemble requirements such as addressing interface gaskets and other issues for combining requirements and separate equipment. The proposed changes also highlight that the standard separately addresses ensemble requirements.

Response Message:

Ballot Results
This item has passed ballot
15 Eligible Voters
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Leban, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Dress, Todd P.
Fifran, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Hickerson, Barry L.
Lancaster, Beth C.
Mann, Philip C.
Patrick, Richard W.

Not Returned:
Davis, James E.
Leban, Michael A.

Response Message:

Ballot Results
This item has passed ballot
15 Eligible Voters
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Leban, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Dress, Todd P.
Fifran, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Hickerson, Barry L.
Lancaster, Beth C.
Mann, Philip C.
Patrick, Richard W.

Not Returned:
Davis, James E.
Leban, Michael A.
7.1.1.3  Garment materials shall be tested for tensile strength as specified in Section 8.4, Tensile Strength Test, and shall have a tensile strength of not less than 50 N (11.2 lbf).

7.1.1.4  Garment materials, excluding visors, interface gaskets, and interface components, shall be tested for bursting strength as specified in Section 8.5, Burst Strength Test, and shall have a bursting strength of not less than 66 N (14.9 lbf).

7.1.1.5  Garment materials, excluding visors, interface gaskets, and interface components, shall be tested for puncture resistance as specified in Section 8.6, Puncture Propagation Tear Resistance Test, and shall have a puncture resistance of not less than 12 N (2.7 lbf).

7.1.1.6  Garment materials shall be tested for tear strength as specified in Section 8.3, Tear Resistance Test Two, and shall have a tear strength of not less than 17 N (3.8 lbf).

7.1.1.7  Garment material seams, excluding visors, interface gaskets, and interface components, shall be tested for breaking strength as specified in Section 8.8, Seam Breaking Strength Test, and shall have a breaking strength of not less than 50 N (11.2 lbf).

7.1.1.8  Garment materials for full body garments including, but not limited to, ensembles, coveralls and full torso and limb encapsulating garments, but excluding visors, interface gaskets, and interface components, shall be tested for moisture vapor transmission rate as specified in Section 8.28, Moisture Vapor Transmission Rate Test, and shall have a moisture vapor transmission rate of 650 g/m² 24 hr or greater.

7.1.1.9  Garment materials shall be tested for flammability as specified in Section 8.35, Flammability Test, and shall have a flame spread time of 3.5 seconds or more.

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 Sep 01 21:16:33 EDT 2015

Committee Statement

Committee Statement:
The TC believes that visor or interface materials and seams if incorporated into hooded garments or separate hoods cannot be evaluated for the same physical properties as specified for the garment material or seams.

The application of tensile strength and trapezoidal tear resistance for single-use garment materials is considered redundant with burst strength and puncture propagation tear resistance tests also applied for characterizing material strength and durability. Single use materials tend to be nonwoven products that are not subject to laundering where both properties (tensile strength and trapezoidal tear resistance) have greater utility in demonstrating durability.

An adjustment is made to the burst strength for multiple-use materials to set a performance level that is commensurate with expected, acceptable field performance.

Response

Message:
Public input No. 65-NFPA 1999-2015 (Sections 7.1.1.3, 7.1.1.4, 7.1.1.5, 7.1.1.6, 7.1.1.7, 7.1.1.8, 7.1.1.9, 7.1.1.10)

Ballot Results

- This item has passed ballot

15 Eligible Voters
- 2 Not Returned
- 13 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstentions

Affirmative All
- Allen, Jason L.
- Corrado, Steven D.
- Davis, Todd P.
- Fitch, William A.
- Freeman, Patricia A.
- Harris, David R.
- Haskell, III, William E.
- Hickerson, Barry L.
- Lancaster, Beth C.
- Lehtonen, Karen E.
- Mann, Philip C.
- Patino, Richard W.
- Smith, Jeff
7.1.2.1 Garments or ensembles shall be tested for liquidtight integrity as specified in Section 8.2, Liquidtight Integrity Test One, and shall allow no water penetration.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Sep 01 18:10:44 EDT 2015

Committee Statement

Committee Statement:
TIA 13-1 incorporated ensemble requirements to address the specific needs of protective against hazardous of highly efficacious and liquidborne pathogens. For expediency, these new requirements were added to the single-use and multiple-use garment sections of the standard. These prepared changes delete the ensemble requirements from the respective garment sections and create new sections specifically for each type of ensemble in separate sections. These changes permit making additional changes to account for specific ensemble requirements such as addressing interface gaskets and other issues for combining elements and separate equipment. The proposed changes also highlight that the standard separately addresses ensemble requirements.

Response Message:

Ballot Results

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

Not Returned
Davis, James E.
Lathan, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harms, David R.
Head, Richard A.
Henderson, Barry J.
Lancaster, Beth C.
Learner, Karen B.
Milo, Philip C.
Patrick, Richland W.
Shearer, JF
7.1.2.3 Each separable layer of garment material, excluding visors, interface gaskets, and interface components, shall be tested for tensile strength as specified in Section 8.4, Tensile Strength Test, and shall have a tensile strength of not less than 225.5 N (50 lbf).

7.1.2.4 Each separable layer of garment material, excluding visors, interface gaskets, and interface components, shall be tested for bursting strength as specified in Section 8.5, Burst Strength Test, and shall have a bursting strength of not less than 222.5 N (50 lbf).

7.1.2.5 Each separable layer of garment material, excluding visors, interface gaskets, and interface components, shall be tested for puncture propagation tear resistance as specified in Section 8.6, Puncture Propagation Tear Resistance Test, and shall have a puncture resistance of not less than 25 N (5 1⁄2 lbf).

7.1.2.6 Each separable layer of garment material, excluding visors, interface gaskets, and interface components, shall be tested for tear strength as specified in Section 8.7, Tear Resistance Test One, and shall have a tear strength of not less than 36 N (8 lbf).

7.1.2.7 Seams from each separable layer of garment material, excluding visors, interface gaskets, and interface components, shall be tested for breaking strength as specified in Section 8.8, Seam Breaking Strength Test, and shall have a breaking strength of not less than 222.5 N (50 lbf).

7.1.2.8 Garment outer shell fabric material, excluding visors, interface gaskets, and interface components, shall be tested for water absorption resistance as specified in Section 8.31, Water Absorption Resistance Test, and shall have a percent water absorption of 30 percent or less.

7.1.2.9 Garment materials and composites, excluding visors, interface gaskets, and interface components, shall be tested for total heat loss as specified in Section 8.32, Total Heat Loss Test, and shall have a total heat loss value of 450 W/m² or greater.

7.1.2.10 Where garments include visors, the visor materials shall be tested for impact resistance as specified in Section 8.41, Visor Drop Ball Impact Resistance Test, and shall not have a full thickness puncture, cracks, holes, or fractures.

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 Sep 01 21:22:35 EDT 2015

Committee Statement
Committee Statement:
The TC believes that visor or interface materials and seams if incorporated into hooded garments or separate hoods cannot be evaluated for the same physical properties as specified for the garment material or seams.

The application of tensile strength and trapezoidal tear resistance for single-use garment materials is considered impractical with burst strength and puncture propagation tear resistance tests also applied for characterizing material strength and durability. Single-use materials tend to be nonwoven products that are not subject to laundering where both properties (tensile strength and trapezoidal tear resistance) have greater utility in demonstrating durability.

Visors if included in the construction of garments are excluded for current physical property testing of garment materials and seams if used as the principal materials of construction for garments. The proposed test is based on requirements taken from ANSI Z87.1 for eye and face protection to provide an equivalent level of protection for the face and eyes to demonstrate compliance with the ball and multiple use ensembles; however, additional work by the Technical Committee will be undertaken to determine if different variations of the test or criteria should be applied to each type of garment visor.

An adjustment is made to the burst strength for multiple-use materials to set a performance level that is commensurate with expected, acceptable field performance.

Response Message:
Public Vote No. 66-NFPA 1999-2015 [Sections 7.1.2.3, 7.1.2.4, 7.1.2.5, 7.1.2.6, 7.1.2.7, 7.1.2.8]
7.1.2.11 Garment materials or composites shall be tested for evaporative resistance as specified in Section 8.43, Evaporative Resistance Test, and shall have an evaporative resistance of not greater than 20 Pa m$^2$/W.

Committee Statement

The environmental conditions first responders face are complex and diverse. Total heat loss (THL) is a very good test for evaluating the ability of materials to manage heat stress but it only evaluates these properties at one condition (77°F, 65% RH). Thus, the THL test does not reflect the full extent of exposure to low humidity and hot temperatures. The THL test is conducted at rest conditions (77°F, 65% RH), which is not the same as the conditions that will be encountered by the first responders during their work. Therefore, THL test results may not accurately reflect the performance of the garment under actual conditions.

Materials with similar THL values can perform quite differently in conditions different than the THL test conditions, such as high ambient temperatures, high humidity, or high radiant heat flux. The THL test does not take into account these factors, which can significantly impact the comfort and performance of the garment. Therefore, it is important to consider the performance of the garment in a wider range of conditions.

The proposed maximum level of 20 is based on research reported in Umbach, K.H., Functional weather protective clothing with good clothing physiology: wear properties, Tethered-Texile effects, 67 (1986), 277-287. This work correlated test subject responses with garments constructed in a range of evaporative resistances with the finding that garments having a range of Ret from 13 to 20 Pa•m$^2$/W were found to be satisfactory or breathable; though uncomfortable at a high activity rate.

Ballot Results

This item has passed ballot
15 Eligible Voters
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Canale, Steven D.
Dazo, Todd P.
Flaherty, William A.
Freeman, Patrick A.
Harris, David R.
Hendrick, H. William E.
Hickerson, Barry L.
Langlois, Beth C.
Laursen, Karen L.
Maden, Philip C.
Patrick, Richard W.
Suarez, Jeff
7.1.2.17
Fastener tape shall be tested for breaking strength as specified in A-A-55126B, Commercial Item Description — Fastener Tapes, Hook and Loop, Synthetic, and ASTM D 5034, Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test) (G-E or G-T), and Section 8.43, Fastener Tape Strength Tests, and shall meet or exceed the minimum breaking strength requirements established for Type 2, Class 1 and Class 4 tapes as set forth in the specification Table 1 in A-A-55126B. Tapes in a 1 in. width shall be used as the basis for performance.

7.1.2.18
Fastener tape shall be tested for shear strength as specified in A-A-55126B, Commercial Item Description — Fastener Tapes, Hook and Loop, Synthetic, Test Method AATCC 61, Colorfastness to Laundering, Home and Commercial: Accelerated, Test 3A, and ASTM D 5170, Standard Test Method for Peel Strength (“T” Method) of Hook and Loop Touch Fasteners, after 3 washings and Section 8.43, Fastener Tape Strength Tests, and shall meet or exceed the minimum shear strength requirements established for Type 2, Class 1 and Class 4 tapes as set forth in the specification Table 1 in A-A-55126B. Tapes in a 1 in. width shall be used as the basis for performance.

7.1.2.19
Fastener tape shall be tested for peel strength as specified in A-A-55126B, Commercial Item Description — Fastener Tapes, Hook and Loop, Synthetic, Test Method AATCC 61, Colorfastness to Laundering, Home and Commercial: Accelerated, Test 3A, and ASTM D 5169, Standard Test Method for Shear Strength (Dynamic Method) of Hook and Loop Touch Fasteners, after 3 washings and Section 8.43, Fastener Tape Strength Tests, and shall meet or exceed the minimum peel strength requirements established for Type 2, Class 1 and Class 4 tapes as set forth in the specification Table 1 in A-A-55126B. Tapes in a 1 in. width shall be used as the basis for performance.
Ensembles shall be tested for overall function as specified in Section 8.44, Overall Ensemble Function and Integrity. This shall be done by having the test subject complete all tasks within 20 minutes, and the garment closure shall remain engaged during the entire garment function test.

Where hoods with visors are provided, the ensemble shall permit the test subject to properly identify three out of four numbers on the NFPA 704-based placard at each of the following angles: upward 36°, downward 30°, and right and left 60°.

Where hoods with visors are provided, the ensemble shall permit the test subject to see with a visual acuity of 20/35 or better through the combination of the hood visor and the respirator facepiece lens.

Where protective flaps cover the closure, the protective flaps shall remain closed for the duration of the overall garment function test.
7.2.3.7 Work gloves shall be tested for grip as specified in Section 8.27, Grip Test, and shall have a weight pulling capacity equal to an average percentage of bare-handed control not less than 80 percent of the bare-handed control values.
7.2.3.12 If the work glove is configured with a separable inner glove, and the inner glove is a single-use emergency examination glove, then the inner glove shall meet all the performance requirements in 7.2.1 Testing specified in 7.2.3.1 and 7.2.3.2 shall not be performed.

7.2.3.13 If the work glove is configured with a separable inner glove, and the inner glove is a single-use emergency cleaning/utility glove, then the inner glove shall meet all the performance requirements in 7.2.2 Testing specified in 7.2.3.1 and 7.2.3.2 shall not be performed.
7.3.4 Face Protection Devices.

7.3.4.1 Face protective devices that are medical face masks or face protection devices that incorporate medical facemask-like designs shall meet the requirements for high barrier performance class medical face masks in accordance with ASTM F 2100, Standard Specification for Performance of Materials Used in Medical Face Masks.

7.3.4.2 Face protection devices shall be tested for liquidtight integrity as specified in Section 8.17, Liquidtight Integrity Test Three, and shall allow no liquid penetration.

7.3.4.3 The barrier portion of face protection devices, excluding the medical face masks, shall be tested for body fluid-borne pathogen resistance as specified in Section 8.3, Biopenetration Test One, and shall exhibit no penetration of the Phi-X174 bacteriophage.

7.3.4.4 Each textile layer used in the construction of the face protection device shall be tested for flammability as specified in Section 8.39, Flammability Test, and shall have an afterflame time of 2.0 seconds or less.

7.3.4.5 For multiple-use face protection devices only, all face protection device hardware and specimens of all face protection device hardware that include metal parts shall be individually tested for resistance to corrosion as specified in Section 8.22, Corrosion Resistance Test, and shall have metals that are inherently resistant to corrosion including but not limited to stainless steel, brass, copper, aluminum, and zinc show no oxidation, shall have ferrous metals show no corrosion of the base metal, and shall have all hardware remain functional.

Committee Statement

The criteria for face protection devices are redundant for other eye and face protection devices that are specified in the standard. The TC plans to develop additional guidance information related to defining various eye and face protection devices addressed by this standard.

Response Message:

Ballot Results

This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Dow, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadtler, Jeff.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 02 11:57:52 EDT 2015

Committee Statement

Committee Statement: The criteria for face protection devices are redundant for other eye and face protection devices that are specified in the standard. The TC plans to develop additional guidance information related to defining various eye and face protection devices addressed by this standard.

Response Message:

Ballot Results

This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Dow, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadtler, Jeff.
Helmets

Helmet suspension systems shall be tested for suspension system separation as specified in Section 8.36, Suspension System Retention Test, and shall have the force required to separate any individual attachment point of the suspension assembly from the helmet shell and each adjusting mechanism of the suspension system assembly not be less than 22 N (5 lbf), and the adjusting mechanisms shall function properly.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Sep 02 08:57:52 EDT 2015

Committee Statement

Committee Statement: The TC is removing the test method information (22N) from the requirement section. The suspension straps are tested to 22N and then inspected for separation. This will also align the requirement with NFPA 1971 and NFPA 1977.

Response Message:

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Not Returned
0 Affirmative with Comments
0 Negative with Comments
0 Absence

Not Returned
Davis, James E.
Husain, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fitzner, William A.
Freeman, Patricia A.
Harr, David A.
Heckel, B. William E.
Henderson, Barry L.
Lanahan, Bert C.
Larue, Karen E.
Larue, Philip C.
Patiot, Richard W.
Sauber, Jeff
Emergency Medical Powered Air-Purifying Respirator Performance Requirements

7.6.1 Where a loose-fitting powered air-purifying respirator is specified, the materials used in the construction of the hood shall meet the garment material performance requirements specified in either 7.1.1 with the exception of the requirement in 7.1.1.7, or 7.1.2 with the exception of 7.1.2.9.

Ballot Results
- This item has passed ballot
  - 15 Eligible Voters
  - 2 Not Returned
  - 12 Affirmative Votes
  - 0 Affirmative with Comments
  - 1 Negative with Comments
  - 0 Abstentions

Committee Statement
Committee Statement:
Specialized forms of respirator devices are needed to address protection from highly infectious diseases as may be used by first responders in first moments. For example, 42 CFR part 82 does not cover the barrier qualities of hoods used in powered air-purifying respirators. The proposed label, design, and performance requirements address emergent medical powered air-purifying respirators and require a change in the scope of the standard that new provides establishment of respirator protection requirements. The Technical Committee intends to make additional adjustments in the Annex to address the guidance on the selection of respiratory protective devices.

Response Message:
There has been little discussion about the RET test until very recently, and since it is being proposed in addition to THL, it is adding yet another test. The justification cites research done in 1986, almost 30 years ago and well before the THL requirements were added to the standard. Further, the justification goes on to explain that RET is part of the same ASTM test method as THL, using the same test equipment; yet it was the THL test that was adopted into the standard years ago. As proposed, the RET test adds a warmer condition (95°F, 40% RH) and while I agree that emergency responders see many, many, different conditions, I am not sure why this one condition is more important or probable than any other. Unlike turnout clothing, EMS workers do not require a minimum level of thermal protection and so the thermal performance protection (TPP) is not a factor. Thus, EMS workers can require and specify much higher THL values, without the consequence of loss of thermal protection.
Ensembles shall be tested for overall function as specified in Section 8.44, Overall Ensemble Function and Integrity Test, and shall allow no water penetration. Garment elements specified as part of the ensemble shall meet the requirements in Section 7.7, Garment Elements, for liquidtight integrity as specified in Section 7.7.6.3, Liquidtight Integrity Test One, and shall allow no water penetration. The work glove elements of the CBRN Protective Ensemble shall also meet all the requirements specified in Section 7.7, Garment Elements, for those protection devices that are not already certified to this standard or are not labeled at least "Z87 D3" in accordance with ANSI Z87.1. Eye and face protection devices that are not already certified to this standard or are not marked at least "Z87 D3" in accordance with ANSI Z87.1 shall allow no water penetration. Emergency Medical Footwear Performance Requirements, shall allow no water penetration.

Where protective flaps cover the closure, the protective flaps shall remain closed for the duration of the overall ensemble function test. Where hoods with visors are provided, the ensemble shall permit the test subject to see with a visual acuity of 20/35 or better through the combination of the hood visor and the respirator facepiece lens. Where the ensemble or garment element includes a hood with a visor that covers the respirator facepiece, the ensemble shall permit the test subject to properly identify three out of four numbers on the NPA 1999-2015 13 A-13 Affirmative All 15 Eligible Voters when viewed through the combination of the hood visor and the respirator facepiece lens.

Where the ensemble includes interface gaskets, each interface gasket material shall be tested for puncture resistance as specified in Section 7.7.5.3, Puncture Resistance Test 1, and shall have a puncture resistance of not less than 9 N (3 lbf). Where the ensemble includes interface gaskets, each interface gasket material shall be tested for cut resistance as specified in Section 7.7.5, Cut Resistance Test 1, and shall have a cut resistance of not less than 5 MPa (725 psi). Where protective flaps cover the closure, the protective flaps shall remain closed for the duration of the overall ensemble function test.
8.1.3.10
Work gloves and work glove pouches shall be tumbled for 60 minutes and shall be removed immediately at the end of the drying cycle. At the conclusion of the final drying cycle, the glove shall be placed on a forced air nontumble drying mechanism operated at 10°C (± 2°C) above current room temperature until completely dry.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 02 09:32:22 EDT 2015

Committee Statement
Experience with glove dryer has shown that 5 degree C tolerance is more realistic and achievable than a 2 degree tolerance. Since the target temperature is only 10 degrees C above room temperature, the increased tolerance should not have any impact on the gloves during drying.

Response Message:

Ballot Results
This item has passed ballot
15 Affirmative
2 Not Returned
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Firther, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Henderson, Barry L.
Lancaster, Beth C.
Larsen, Karen E.
Marks, Philip C.
Patrick, Richard W.
Staab, Jeff

Not Returned
Davis, James E.
Laron, Michael A.
Washing and Drying Procedure for Garment Materials.

Specimens shall be washed and dried in accordance with the procedure specified in Machine Cycle 1, Wash Temperature V, and Drying Procedure Ai, of the 2004 edition of AATCC 135, Dimensional Changes in Automatic Home Laundering of Woven and Knit Fabrics. A 1.8 kg (4.0 lb) load shall be used. A laundry bag shall not be used.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submit Date: Wed Sep 02 15:03:48 EDT 2015

Committee Statement
Committee Statement: This change would allow for preconditioning of garment materials, as opposed to having to launder whole garments and cut specimens from the garments. This brings the testing requirements more in line with other NFPA clothing standards in general, and NFPA 1951 specifically.

Response Message:
Public Input No. 4-NFPA 1999-2015 [New Section after 8.1.4]

Ballot Results
This item has passed ballot
15 Eligible Voters
2 Not Returned
0 Affirmative with Comments
0 Negative with Comments
0 Absent

Not Returned
Davis, James E.
Larkin, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Freeman, Patricia A.
Harr, David A.
Hoskold, B. William E.
Hinkler, Barry L.
Lancaster, Beth C.
Lammers, Karen E.
LeBlanc, Philip C.
Patrick, Richard W.
Quattle, Jeff

Eligible Voters
Davis, James E.
Hinkler, Barry L.
Lancaster, Beth C.
Lammers, Karen E.
8.1.9* Work Glove Test Areas.
Work glove test areas shall be as described below and shown in Figure 8.1.9.1. Work glove test area abbreviations shall be as follows: P = Palm; B = Back; S = Side.

1. A-P: Palm side of hand from finger crotch line to 1/3 of the way down (grasp area)
2. B-P: Palm side of hand from 1/3 of the way down (grasp area) to the wrist crease
3. C-P: Palm side of hand from the wrist crease to 50 mm (2 in.) past the wrist crease
4. D-P: Palm side of thumb
5. E-P: Palm side of tip of thumb
6. F-P: Palm side of index finger
7. G-P: Palm side of fingertip of index finger
8. H-P: Palm side of nonindex fingers
9. I-P: Palm side of fingertip of nonindex fingers
10. A-PS: Sides of hand adjacent to section A-P
11. B-PS: Outside of hand adjacent to section B-P
12. C-PS: Sides of hand adjacent to section C-P
13. D-PS: Outside of thumb adjacent to section D-P
14. E-PS: Inside of thumb adjacent to section D-P
15. F-PS: Outside of index finger adjacent to section F-P
16. H-PS: In between fingers adjacent to sections F-P and H-P
17. I-PS: Outside of and adjacent to the smallest finger
18. A-B: Back side of hand from finger crotch line to 1/3 of the way down (knuckle area)
19. B-B: Back side of hand from 1/3 of the way down (knuckle area) to the wrist crease
20. C-B: Back side of hand from the wrist crease to 50 mm (2 in.) past the wrist crease
21. D-B: Back side of thumb
22. E-B: Back side of tip of thumb
23. F-B: Back side of index finger
24. G-B: Back side of fingertip of index finger
25. H-B: Back side of nonindex fingers
26. I-B: Back side of fingertip of nonindex fingers
27. A-BS: Sides of hand adjacent to section A-B
28. B-BS: Outside of hand adjacent to section B-B
29. C-BS: Sides of hand adjacent to section C-B
30. D-BS: Outside of thumb adjacent to section D-B
31. E-BS: Inside of thumb adjacent to section D-B
32. F-BS: Outside of index finger adjacent to section F-B
33. H-BS: In between fingers adjacent to sections F-B and H-B
34. I-BS: Outside of and adjacent to the smallest finger

Figure 8.1.9.1 Work Glove Test Areas.
Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Sep 02 09:37:42 EDT 2015

Committee Statement
Committee Statement: The TC is making editorial changes. The glove test area system was introduced during the last revision cycle. The existing and figure was borrowed from NFPA 1971. For the test change, the area of the glove that is 2 inches beyond the wrist crease is part of the tested glove body in NFPA 1971, but in NFPA 1999, the glove body stops at the wrist crease. So the area 2 inches beyond the wrist crease does not have the same significance for NFPA 1999 and therefore this area should be given in generic terminology.

Response Message: 

Ballot Results
This item has passed ballot
15 Affirmative votes
2 Not Returned
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Firther, William A.
Freeman, Patricia A.
Harris, David K.
Hendal, B. William E.
Henderson, Barry L.
Lancaster, Seth C.
Lathers, Karen E.
Nelson, Philip C.
Patterson, Richard W.
Soltau, Jeff

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
8.1.10 Flexural Fatigue Procedure for CBRN Barrier Layer.

Specimens shall be subjected to flexural fatigue in accordance with ASTM F 392, Standard Test Method for Flex Durability of Flexible Barrier Materials, with the following modification. In lieu of flexing conditions A, B, C, D, or E, test specimens shall have a flex period of 3,000 cycles at 45 cycles per minute. A cycle shall be full flex and twisting action.

8.1.11 Abrasion Procedure for CBRN Barrier Layer.

Specimens shall be abraded in accordance with ASTM D 4157, Standard Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method), under the following conditions:

- A 2.3 kg (5 lb) tension weight shall be used.
- A 1.6 kg (3.5 lb) head weight shall be used.
- The abradants shall be each of the material layers in the composite that are adjacent to the CBRN barrier layer.
- The specimen shall be abraded for a total of 60,000 cycles.
- The specimen shall be abraded for half of the cycles against the outer layer of the composite with the specimen facing the outer layer in its normal "as worn" orientation.
- The specimen shall be then abraded for the remaining cycles against the inner layer of the composite with the specimen facing the inner layer in its normal "as worn" orientation.
- Where an outer layer or inner layer does not exist, the material shall be self-abraded, inner layer on inner layer, or outer layer on outer layer.
8.2.5.4

The use of tape shall be permitted when testing single-use ensembles. The tape shall be applied using the instructions supplied by the manufacturer as required in 5.2.3(2).

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [ Not Specified ]
Street Address: 
City: 
State: 
Zip: 
Submit Date: Tue Sep 01 15:06:02 EDT 2015

Committee Statement

Committee Statement: The TC is removing this paragraph because there are no consistent methods for taping.
Response Message:

Ballot Results

This item has passed ballot
15 Eligible Voters
3 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Davis, James E.
Laton, Michael A.
Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Harris, David R.
Hickerson, Barry L.
Haskell, III, William E.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Solomon, Jeff
8.3.3.2 Samples of multiple-use garments, barrier layer and garment barrier layer seams shall be conditioned as specified in 8.1.4, and then conditioned as specified in 8.1.2. The garment barrier layer and garment barrier layer seams shall be permitted to be representative materials and seams used in the actual construction of representative garments and seams.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submit Date: Tue Sep 01 22:05:47 EDT 2015

Committee Statement
Committee Statement: This change will allow for preconditioning of garment materials, as opposed to having to launder whole garments and cut specimens from the garments. This brings the testing requirements in line with other NFPA clothing standards in general, and NFPA 1951 specifically.

Ballot Results
This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Lazar, Michael A.
Affirmative All
Allen, Jason L.
Corrado, Steven G.
Davis, Todd P.
Fidler, William A.
Freeman, Patricia A.
Haars, David R.
Hendrick, William E.
Hennigan, Barry L.
Lancaster, Beth C.
Larison, Kevin E.
Mann, Philip C.
Patrick, Richard W.
Sotber, Jeff
8.3.11 Specific Requirements for Testing Work Glove Materials.

8.3.11.1 Work gloves that include separable inner gloves that are either single-use emergency medical examination gloves or single-use emergency medical cleaning/utility gloves shall not be evaluated for this requirement.

8.3.11.2 If the work glove contains a separable liner, the liner shall be combined with the work glove for purposes of conditioning as specified in 8.3.11.4.

8.3.11.3 Specimens shall be representative of the glove moisture barrier and moisture barrier seams. Three specimens shall be tested.

8.3.11.4 Samples for conditioning shall be in the form of an 200 mm × 200 mm (8 in. × 8 in.) pouch. A smaller pouch size shall be permitted provided that the resulting test specimens are at sufficient size for the test. The pouch shall be made of two glove composite swatches. The two glove composites shall be oriented to form the same material and construction. The two glove composites shall be connected by a seam created as follows: the seam is located in the approximate center of the glove, on either side of the glove seam, on either side of the glove seams, and on either side of the glove seams. The two glove composites shall be stitched on all four sides using the same thread as used in the glove construction. The two composite swatches shall then be sewn together, inner liner to inner liner, on three sides using the same material as used in the glove construction. The two composite swatches shall then be sewn together, inner liner to inner liner, on three sides using the same material as used in the glove construction.

8.3.11.5 Samples shall be conditioned as specified in 8.3.3. If the glove liner for an examination glove is issued for single use only, it shall be conditioned as specified in 8.1.2.

8.3.11.6 The glove moisture barrier layers shall be removed from the multilayer composite samples after all preconditioning has been completed and shall become the glove barrier test specimens.

8.3.11.7 Specimens for testing shall be the barrier layer only.

8.3.11.8 Moisture barrier material, if continuous through the glove body, only the barrier seams shall be tested. The test cell shall include both the moisture barrier material and the moisture barrier seams. The seam shall be located in the approximate center of the test cell.
8.4.3.1  
Samples for conditioning shall be the entire complete garment or at least 1 m$^2$ (1 yd$^2$) of the garment material or whole footwear cover.

Committee Statement

NFPA 1999 as currently written requires material samples for testing be cut from whole garments which have been preconditioned. This causes manufacturers to submit multiple garments simply to provide enough yardage for the labs to be able to cut the correct sample sizes. However, even NFPA 1999 has exceptions to the whole garment preconditioning requirement, such as test methods for measuring permeabilities and breathability but has been preconditioned. Other than a whole garment test specifically conditioned. Many of the garments currently certified to NFPA 1999 do indeed have dual certification to NFPA 1901, which means the testing is done both on whole garments that have been preconditioned and then again on preconditioned garment materials. NFPA 1901 is the only NFPA standard that currently requires material samples be cut from whole garments and there is no evidence that this costly preconditioning requirement adds anything to the firefighter safety.

Response

Message:

This item has passed ballot

15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven G.
Davis, Todd P.
Flanagan, William A.
Freeman, Patricia A.
Harris, David R.
Hickerson, Barry L.
Hollander, Beth C.
Lancaster, Kenneth E.
Mann, Philip C.
Patrick, Richard W.
Sidler, Jeff
8.5.3.1
Samples for conditioning shall be complete garments at least 1 m$^2$ (1 yd$^2$) of material.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Sep 02 15:05:21 EDT 2015

Committee Statement
Committee Statement: NFPA 1999 as currently written requires material samples for testing be cut from whole garments which have been preconditioned. This causes manufacturers to submit multiple garments simply to provide enough yardage for the labs to be able to cut the correct sample sizes. There is precedence for this in NFPA 1999 of cut yardage except in certain parameters testing, as mentioned on page 216 regarding the labelling. When the quality of the garment is not 100% consistent, it is more common to do garment testing which has also been pre-conditioned. Many of the garments currently certified to 1999 are also dual certified to NFPA 1951, which requires the testing to be done both on whole garments that have been preconditioned and then again on preconditioned garment materials. NFPA 1999 is the only NFPA standard that currently requires material samples be cut from whole garments.

Response
Response: 

Ballot Results
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Lator, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Patrick, Richard W.
Sadtler, Jeff

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
8.6.3.1 Samples for conditioning shall be complete garments at least $1 \text{ m}^2$ (1 yd$^2$) of material.

Committee Statement

NFPA 1999 as currently written requires statistical samples for testing be cut from whole garments which have been preconditioned. This causes manufacturers to submit multiple garments: simply to provide enough yardage for the labs to be able to cut the correct sample sizes. There is precedence for this in NFPA 1999 in that both water absorption and viral penetration testing are performed on material yardage that has been preconditioned. Since the current standard has been previously published as a text of the garment currently certified to 1999 and also dual certified to NFPA 1991, which requires the testing be done on whole garments that have been preconditioned and then again on preconditioned garment materials. NFPA 1999 is the only NFPA standard that currently requires statistical samples be cut from whole garments.

Ballot Results

This item has passed ballot

18 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Laton, Michael A.
Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harms, David R.
Hewlett, Stephen E.
Hodover, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Miers, Philip C.
Patrick, Richard W.
Sadler, Jeff
8.7.3.1

Samples for conditioning shall be complete garments at least 1 m² (1 yd²) of material.

Committee Statement

NFPA 1999 as currently written requires material samples for testing be cut from whole garments which have been preconditioned. This causes manufacturers to submit multiple garments simply to provide enough yardage for the labs to be able to cut the correct sample sizes. There is precedence for this in NFPA 1999 in that both water absorption and viral penetration testing are performed on material yardage that has been preconditioned. Many of the garments currently certified to 1999 are also dual certified to NFPA 1951, which requires the testing be done on whole garments that have been preconditioned and then again on preconditioned garment materials. NFPA 1999 is the only NFPA standard that currently requires material samples be cut from whole garments.

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Absent

Affirmative All
Allen, Jason L.
Bennett, Brian R.
Canto, Steven D.
Card, Tom P.
Finn, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Humanics, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
McCormick, Richard W.
Middaugh, Jeff

Not Returned
Davis, James E.
Laton, Michael A.

National Fire Protection Association Report http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
8.8.3.1 Samples for conditioning shall be **complete garments** at least 1 m$^2$ (1 yd$^2$) of material.

Committee Statement
NFPA 1999 as currently written requires material samples for testing be cut from whole garments which have been preconditioned. This causes manufacturers to submit multiple garments simply to provide enough yardage for the labs to be able to cut the correct sample sizes. There is precedence for this in NFPA 1999 of both whole garments and test parameters testing are performed on material samples that when preconditioned, are cut from whole garments used. Many current or previously certified garments are also dual certified to NFPA 1991, which requires that the testing be done on both whole garments that have been preconditioned and then again on preconditioned garment materials. NFPA 1999 is the only NFPA standard that currently requires material samples be cut from whole garments.

Response
This item has passed ballot.

Ballot Results
This item has passed ballot

15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned:
Davis, James E.
Laton, Michael A.

Affirmative All:
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harms, David K.
Hodak, J. William E.
Hoffman, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mills, Philip C.
Patrick, Richard W.
Sadtler, Jeff

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 02 15:06:55 EDT 2015
8.11 Ultimate Tensile Strength Test.

8.11.1 Application.
This test shall be applied to glove and interface gasket materials.

8.11.1.1 This test shall be applied to glove and interface gasket materials.

8.11.1.2 Modifications to this test method for testing interface gasket materials shall be as specified in 8.11.7.

8.11.2 Specimens.
8.11.2.1 A minimum of 10 specimens shall be tested.
8.11.2.2 Specimens shall be taken from the palm and back of individual gloves.
8.11.2.3 Samples for conditioning shall be cut from whole gloves.
8.11.3 Specimens shall be tested for ultimate tensile strength after conditioning as specified in 8.11.7.1.
8.11.3.2 Specimens shall be tested for ultimate tensile strength after conditioning as specified in 8.11.7.2.

8.11.4 Procedure.
Specimens shall be tested in accordance with Method A — Dumbbell Specimens, of ASTM D 412a, Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers — Tension. Specimens shall be cut using Die C (metric).

8.11.5 Report.
8.11.5.1 The ultimate tensile strength before and after heat aging shall be recorded and reported for each specimen to the nearest 10 kPa (2 psi).
8.11.5.2 The average ultimate tensile strength before and after heat aging shall be calculated and reported for all specimens tested.

8.11.6 Interpretation.
The average ultimate tensile strength both before and after heat aging shall be individually used to determine pass/fail performance.

8.11.7 Specific Requirements for Testing Interface Gasket Materials.
8.11.7.1 Samples for conditioning shall be either interface gasket sheet material of a size that is sufficient large to provide the required number of specimens or formed hood gaskets.
8.11.7.2 Specimens shall be taken from interface gasket sheet material or formed hood gaskets that are representative of the gasket material nominal thickness.

Supplemental Information

Committee Statement
Interface gaskets may be used on products to provide joints with eye/face protection devices or respirators or other ensemble elements with the garment. The nature of these materials require that separate requirements be developed. Visor materials may also be used in the construction of some garments. Visors or interface materials and seams if incorporated into hooded garments as separate hoods cannot be evaluated for the same physical properties as specified for the garment material or seams. Modifications of the ultimate, tensile, puncture resistance, and cut resistance test methods are needed to accommodate the testing of interface gasket materials based on new criteria added to the ensemble performance requirements in a separate set of revisions for the ensemble requirements.

Ballot Results
This item has passed ballot.
15 Eligible Voters
2 No Recommendation
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Absent

Affirmative All
Allen, Jason L.,
Corrado, Steven G.,
Davis, Todd P.,
Finko, William A.,
Freeman, Patricia A.,
Harris, David R.,
Haskard, II, William E.,
Hickerson, Barry L.,
Lancaster, Scott C.,
Lammers, Karen E.,
Maker, Philip C.,
Patrick, Richard W.,
Scott, Jeff.
Additional Substantiation for PIs 83 84 85

Excerpt from “Physical Property Test Methods and Requirements” of “Testing and Validation Efforts to Improve NIJ 0116.00 on CBRNE Personal Protective Equipment” Report to National Institute of Justice dated 30 November 2014. Excerpt provides data supporting new proposed requirements for interface gaskets.

Elastomeric or plastic materials used as part of the garment interface with respirators are key component of garments. These materials are not separately categorized in the list of test materials and could be interpreted as a garment material. While these materials are expected to have the same chemical resistance and other barrier properties consistent with the primary garment material, the nature of their application suggests a different physical property test set. This is due to the fact that these materials are generally elastic in nature and shaped as a gasket to permit flexibility for creating a seal between the hood and respiratory facepiece. On the basis of this information, two industry faceseal materials – one for a NFPA 1994 Class 2 ensemble and another for a NFPA 1994, Class 3 ensemble – were evaluated for puncture and cut resistance. As the Class 2 gasket material was provided in a sheet form, it was readily evaluated for burst strength and other tests. The Class 3 gasket material was provided in an already molded gasket that made specimens availability difficult for some tests. Given the elastic nature of both materials, conventional tear resistance tests (Elmendorf and trapezoidal) were not applied. Instead, the two gasket materials were subjected to evaluations using a rubber tear strength method and tested for both tensile strength and elongation. These results appear in Table 15.

**Table 1 - Physical Property Test Results for Two Hood Gasket Materials**

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness (mil)</th>
<th>Burst strength (N)</th>
<th>Peak tear resistance (N)*</th>
<th>Unit thickness tear strength (N/cm)*</th>
<th>Ultimate tensile strength (MPa)**</th>
<th>Ultimate elongation (%)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1 – Hood gasket†</td>
<td>58</td>
<td>329</td>
<td>9.2</td>
<td>63.1</td>
<td>6.81</td>
<td>267</td>
</tr>
<tr>
<td>S2 – Hood gasket‡</td>
<td>29</td>
<td>45.8</td>
<td>12.9</td>
<td>177</td>
<td>9.06</td>
<td>886</td>
</tr>
</tbody>
</table>

* Testing performed according to ASTM D624, *Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers*, using the “T” die, which is rectangle with a slit down the the center of the major axis as pictured in Figure 25a; Unit thickness tear strength is the peak tear force divided by the specimen thickness.

** Testing performed according to ASTM D412, *Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers—Tension*; testing was performed using the “dumbbell” shaped specimen with measurement of the force and elongation at break (see Figures 25b and 25c).

† Hood gasket used in a representative NFPA 1994, Class 2 ensemble; material provided in a sheet form.
‡ Hood gasket used in a representative NFPA 1994, Class 3 ensemble; material provided as a molded gasket in usable form.

Figure 1 - Rubber Tear and Tensile Strength Tests

Unless otherwise classified, garment hood gasket materials would be considered a garment material and would therefore need to meet the criteria established for the base garment material. If this were the case, then neither material could meet the NIJ 0116.00 burst strength requirement. It is important to point out that the relatively low burst strength for Material S2 was partially due to its high extension prior to bursting. While Elmendorf or trapezoidal tear resistance could not be measured, a test method appropriate for elastomeric materials was applied. In this test, the peak tear force is reported and then normalized by dividing the tear force by the material thickness (unit thickness tear strength). In this case, the thinner more elastic material provided the higher tear resistance. Similarly, the more elastic material produced a significantly higher ultimate tensile strength (force measured at breakage) and three times the amount of material before breaking. A comparison of the two gaskets in their respective ensembles shows greater ease in creating the interface with the Class 3 gasket material.

Two other properties generally applied to rubber materials include puncture and cut resistance. Both properties were measured on the two gasket materials with the results shown in Table 16.
Table 2 – Puncture and Cut Resistance Test Results for Two Hood Gasket Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness (mil)</th>
<th>Puncture resistance (N)</th>
<th>Blade travel distance (mm)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td>&gt;43.5</td>
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<td>S2 – Hood gasket†</td>
<td>29</td>
<td>11.4</td>
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</table>

* Average distance of blade travel for respective load for modified testing according to ASTM F1790.
† Hood gasket used in a representative NFPA 1994, Class 2 ensemble; material provided in a sheet form.
‡ Hood gasket used in a representative NFPA 1994, Class 3 ensemble; material provided as a molded gasket in usable form.

In contrast to the tear and tensile tests, Material S1 showed a higher puncture resistance and greater cut resistance compared to material S2. The puncture resistance would be considered acceptable for garment materials but not glove materials according to NIJ 0116.00; however the cut resistance for material S2 could not meet the 200 gram criterion.

Garment gasket materials warrant their own set of physical property criteria that account for their intended function and limited areas as part of the overall ensemble. Puncture and cut resistance appear to be appropriate properties but a lower cut resistance criterion is needed to accommodate the NFPA 1994 Class 3 ensemble for which there have been no field complaints specifically for the durability/physical hazard resistance of the current gasket. A related ultimate tensile strength is also suggested to address material elasticity.
8.12.3.1

Samples for conditioning shall be cut from whole gloves.

Committee Statement

Committee Statement: The TC is clarifying the requirements for sample conditioning.

Response Message:

Ballot Results

This item has passed ballot

15 Eligible Voters

2 Not Returned

13 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstentions

Not Returned

Davis, James E.

Laton, Michael A.

Affirmative All

Allen, Jason L.

Corrado, Steven D.

Davis, Todd P.

Fitch, William A.

Freeman, Patricia A.

Harris, David R.

Heidt, Billie E.

Henderson, Gary L.

Lancaster, Bert C.

Larsen, Karen E.

Mann, Philip C.

Patrick, Richard W.

Sadtler, Jeff
8.13.11.1 Puncture Resistance Test One.

This test shall be applied to examination, cleaning, and work glove materials, footwear upper materials, footwear cover materials, and interface gasket materials.

8.13.11.2 Modifications to this test method for testing examination, cleaning, and work glove materials shall be as specified in 8.13.7.1 and 8.13.8.

8.13.11.3 Modifications to this test method for testing footwear upper material shall be as specified in 8.13.9.

8.13.11.4 Modifications to this test method for testing footwear cover materials shall be as specified in 8.13.10.

8.13.11.5 Modifications to this test method for testing interface gasket materials shall be as specified in 8.13.11.

8.13.11.6 Modifications to this test method for testing examination, cleaning, and work glove materials shall be as specified in 8.13.7.

8.13.12 Sample Preparation.

A minimum of three specimens measuring at least 100 mm \( (2 \times 2) \) shall be tested.

8.13.13 Sample Preparation.

Samples for conditioning shall be complete gloves, whole footwear, and whole footwear covers.

8.13.14 Specimens shall be tested after conditioning as specified in 8.1.2.

8.13.15 Procedure.

Specimens shall be tested in accordance with ASTM F 1342, Standard Test Method for Protective Clothing Material Resistance to Puncture, using Test Method A, with the following modifications:

(1) The compression load cell shall be capable of discerning 0.5 N (0.1 lbf) of force in the range suitable for the glove material being tested. The upper limit of the load cell shall not be more than 10 times the actual puncture resistance measured for the glove specimen.

(2) Ridged areas or similar where stitching is used to create specific performance characteristics rather than for glove assembly shall be tested. Specimens shall not include seams except in the following cases:

(a) Where there are side constraints of a material testing it is necessary to allow stitching in order to create the sample size required.

(b) Where there are side constraints of a material testing it is necessary to allow stitching in order to create the sample size required.

8.13.16 The puncture force shall be recorded and reported for each specimen to the nearest 0.5 N (0.1 lbf) of force.

8.13.17 The average puncture force shall be calculated and reported for all specimens tested.

8.13.18 The average puncture force shall be used to determine pass/fail performance.

8.13.19 Specific Requirements for Testing Examination and Cleaning Glove Materials.

Specimens shall consist of each composite of the palm side of the fingers, and back of the glove with layers arranged in the proper order.

8.13.19.1 Where the specimens 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.

8.13.20 Specific Requirements for Testing Shoe Upper Materials.

Specimens shall be representative of the glove body composite construction at the following glove areas as described in 8.13.7.1:


(2) Where more than one material is used in the construction of the footwear cover, then each material shall be tested separately.

8.13.21 Specific Requirements for Testing Footwear Cover Materials.

Specimens shall be taken from the footwear cover that are representative of the footwear cover construction.

8.13.21.1 Where more than one material is used in the construction of the footwear cover, then each material shall be tested separately.

8.13.22 Specific Requirements for Testing Interface Gasket Materials.

Specimens shall be taken from interface gasket sheet material or formed hood gaskets that are representative of the gasket material and interface gasket materials.

8.13.22.1 Specimens shall not include seams except in the following cases:

(a) Where a composite is identical to another composite except for additional reinforcement layer(s), the composite with no reinforcement layers shall be representative of the composite with reinforcement layer(s). Specimens shall not include seams except in the following cases:

(b) Where a composite is identical to another composite except for additional reinforcement layer(s), the composite with no reinforcement layers shall be representative of the composite with reinforcement layer(s). Specimens shall not include seams except in the following cases:

(c) Where a composite is identical to another composite except for additional reinforcement layer(s), the composite with no reinforcement layers shall be representative of the composite with reinforcement layer(s). Specimens shall not include seams except in the following cases:

(d) Where a composite is identical to another composite except for additional reinforcement layer(s), the composite with no reinforcement layers shall be representative of the composite with reinforcement layer(s). Specimens shall not include seams except in the following cases:

(e) Where a composite is identical to another composite except for additional reinforcement layer(s), the composite with no reinforcement layers shall be representative of the composite with reinforcement layer(s). Specimens shall not include seams except in the following cases:

(f) Where a composite is identical to another composite except for additional reinforcement layer(s), the composite with no reinforcement layers shall be representative of the composite with reinforcement layer(s). Specimens shall not include seams except in the following cases:

8.13.23 Specific Requirements for Testing Examination, Cleaning and Work Glove Materials.

Specimens shall be taken from the wear surface exterior to interior of the footwear cover.

8.13.24 Specific Requirements for Testing Interface Gasket Materials.

Specimens shall be taken from the footwear wear surface and shall include all layers used in the construction of the footwear cover from wear surface exterior to interior of the footwear cover.

8.13.25 Specific Requirements for Testing Reinforcement Layer Materials.

Specimens shall be taken from the footwear wear surface and shall include all layers used in the construction of the footwear cover from wear surface exterior to interior of the footwear cover.

8.13.26 Specific Requirements for Testing Reinforcement Layer Materials.

Specimens shall be taken from the footwear wear surface and shall include all layers used in the construction of the footwear cover from wear surface exterior to interior of the footwear cover.

8.13.27 Specific Requirements for Testing Reinforcement Layer Materials.

Specimens shall be taken from the footwear wear surface and shall include all layers used in the construction of the footwear cover from wear surface exterior to interior of the footwear cover.

8.13.28 Specific Requirements for Testing Reinforcement Layer Materials.

Specimens shall be taken from the footwear wear surface and shall include all layers used in the construction of the footwear cover from wear surface exterior to interior of the footwear cover.

Supplemental Information

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
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</tbody>
</table>

Submitter Information Verification

Submitter Full Name: Doe, Donald J.
Organization: [Not Specified]
City: [Not Specified]
Street Address: [Not Specified]
Zip: [Not Specified]
Submittal Date: Tue Sep 01 21:27:31 EDT 2015

Committee Statement

Committee Statement:
Interface gaskets may be used in a product to provide joints with fireproof protection elements or respirators or other outerwear elements with the garment. This nature of these materials requires that separate requirements be developed. Visor materials may also be used in the construction of some garments.

The proposed revisions are similar to those proposed for both NFPA 1992 and NFPA 1994.

Response Message:
Public Input No. 84-NFPA 1999-2015 [Section No. 8.13]

Ballot Results

- This item has passed ballot

- 15 Negative Votes
- 2 Not Reached
- 13 Affirmative Alt
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstain

Not Returned:
Doe, Joseph A.
Larson, Michael A.

Affirmative Alt:
Allen, Jason L.
Garcia, Steven D.
Doe, Todd P.
Folks, William A.
Freeman, Patricia A.
Harris, David R.
Huskett, Bill W.
Hines, Barry L.
Laranski, Beth G.
Additional Substantiation for PIs 83 84 85

Excerpt from “Physical Property Test Methods and Requirements” of “Testing and Validation Efforts to Improve NIJ 0116.00 on CBRNE Personal Protective Equipment” Report to National Institute of Justice dated 30 November 2014. Excerpt provides data supporting new proposed requirements for interface gaskets.

Elastomeric or plastic materials used as part of the garment interface with respirators are key component of garments. These materials are not separately categorized in the list of test materials and could be interpreted as a garment material. While these materials are expected to have the same chemical resistance and other barrier properties consistent with the primary garment material, the nature of their application suggests a different physical property test set. This is due to the fact that these materials are generally elastic in nature and shaped as a gasket to permit flexibility for creating a seal between the hood and respiratory facepiece. On the basis of this information, two industry faceseal materials – one for a NFPA 1994 Class 2 ensemble and another for a NFPA 1994, Class 3 ensemble – were evaluated for puncture and cut resistance. As the Class 2 gasket material was provided in a sheet form, it was readily evaluated for burst strength and other tests. The Class 3 gasket material was provided in an already molded gasket that made specimens availability difficult for some tests. Given the elastic nature of both materials, conventional tear resistance tests (Elmendorf and trapezoidal) were not applied. Instead, the two gasket materials were subjected to evaluations using a rubber tear strength method and tested for both tensile strength and elongation. These results appear in Table 15.

Table 1 - Physical Property Test Results for Two Hood Gasket Materials

<table>
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<tr>
<th>Material</th>
<th>Thickness (mil)</th>
<th>Burst strength (N)</th>
<th>Peak tear resistance (N)*</th>
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<th>Ultimate tensile strength (MPa)**</th>
<th>Ultimate elongation (%)**</th>
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<td>S1 – Hood gasket†</td>
<td>58</td>
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<td>9.2</td>
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<td>267</td>
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<td>S2 – Hood gasket‡</td>
<td>29</td>
<td>45.8</td>
<td>12.9</td>
<td>177</td>
<td>9.06</td>
<td>886</td>
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* Testing performed according to ASTM D624, Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers, using the “T” die, which is rectangle with a slit down the the center of the major axis as pictured in Figure 25a; Unit thickness tear strength is the peak tear force divided by the specimen thickness.

** Testing performed according to ASTM D412, Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers—Tension; testing was performed using the “dumbbell” shaped specimen with measurement of the force and elongation at break (see Figures 25b and 25c).

† Hood gasket used in a representative NFPA 1994, Class 2 ensemble; material provided in a sheet form.
Hood gasket used in a representative NFPA 1994, Class 3 ensemble; material provided as a molded gasket in usable form.

![Diagram of gasket](image)

(a) ASTM D624 “T” Specimen  
(b) ASTM D412 Dumbbell Specimen  
(c) ASTM D412 Measurement of Ultimate Tensile Strength and Elongation

*Figure 1 - Rubber Tear and Tensile Strength Tests*

Unless otherwise classified, garment hood gasket materials would be considered a garment material and would therefore need to meet the criteria established for the base garment material. If this were the case, then neither material could meet the NIJ 0116.00 burst strength requirement. It is important to point out that the relatively low burst strength for Material S2 was partially due to its high extension prior to bursting. While Elmendorf or trapezoidal tear resistance could not be measured, a test method appropriate for elastomeric materials was applied. In this test, the peak tear force is reported and then normalized by dividing the tear force by the material thickness (unit thickness tear strength). In this case, the thinner more elastic material provided the higher tear resistance. Similarly, the more elastic material produced a significantly higher ultimate tensile strength (force measured at breakage) and three times the amount of material before breaking. A comparison of the two gaskets in their respective ensembles shows greater ease in creating the interface with the Class 3 gasket material.

Two other properties generally applied to rubber materials include puncture and cut resistance. Both properties were measured on the two gasket materials with the results shown in Table 16.
### Table 2 – Puncture and Cut Resistance Test Results for Two Hood Gasket Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness (mil)</th>
<th>Puncture resistance (N)</th>
<th>Blade travel distance (mm)*</th>
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* Average distance of blade travel for respective load for modified testing according to ASTM F1790.
† Hood gasket used in a representative NFPA 1994, Class 2 ensemble; material provided in a sheet form.
‡ Hood gasket used in a representative NFPA 1994, Class 3 ensemble; material provided as a molded gasket in usable form.

In contrast to the tear and tensile tests, Material S1 showed a higher puncture resistance and greater cut resistance compared to material S2. The puncture resistance would be considered acceptable for garment materials but not glove materials according to NIJ 0116.00; however the cut resistance for material S2 could not meet the 200 gram criterion.

Garment gasket materials warrant their own set of physical property criteria that account for their intended function and limited areas as part of the overall ensemble. Puncture and cut resistance appear to be appropriate properties but a lower cut resistance criterion is needed to accommodate the NFPA 1994 Class 3 ensemble for which there have been no field complaints specifically for the durability/physical hazard resistance of the current gasket. A related ultimate tensile strength is also suggested to address material elasticity.
8.18 Cut Resistance Test

8.18.1 Application

This test method shall apply to cleaning/utility gloves, work gloves, interface gasket materials, and interface gasket materials.

8.18.2 Modifications to this test method for evaluation of cleaning/utility gloves shall be as specified in 8.18.7.

8.18.3 Modifications to this test method for evaluation of interface gasket materials shall be as specified in 8.18.9.

8.18.4 Modifications to this test method for evaluation of footwear upper materials shall be as specified in 8.18.10.

8.18.5 Modifications to this test method for evaluation of interface gasket materials shall be as specified in 8.18.9.

8.18.6 Modifications to this test method for evaluation of footwear upper materials shall be as specified in 8.18.10.

8.18.7 Specific Requirements for Testing Work Gloves

Ridged areas or similar where stitching is used to create specific performance characteristics rather than for glove assembly and shall not include seams: A-P, B-P, D-P, E-P, F-P, G-P, H-P, I-P, A-B, B-B, D-B, E-B, F-B, G-B, H-B, and I-B. Specimens shall be representative of each glove body.

When there are size constraints of a material making it necessary to allow stitching in order to create the sample size required.

8.18.8 Specific Requirements for Testing Cleaning/Utility Gloves

Cut resistance testing shall be performed under a load of 350 g (12.3 oz).

Specimens shall be taken from interface gasket sheet material or formed hood gaskets that are representative of the gasket material's nominal thickness.

Samples for conditioning shall be either interface gasket sheet material of a size that is sufficiently large to provide the required number of specimens or formed hood gaskets.

8.18.9 Specific Requirements for Testing Footwear Upper Materials

Cut resistance testing shall be performed under a load of 75 g (2.5 oz).

Specimens shall consist of each composite of the footwear upper used in the actual footwear construction, excluding the reinforcement layers shall be representative of the composite with reinforcement layer(s).

Specimens shall not include seams except in the following cases:

(1) Ridged areas or similar where stitching is used to create specific performance characteristics other than for glove assembly.

(2) When there are size constraints of a material making it necessary to allow stitching in order to create the sample size required.

8.18.10 Specific Requirements for Testing Interface Gasket Materials

Cut resistance testing shall be performed under a load of 25 g (0.9 oz).

Specimens shall be taken from the back and palm of the glove and shall not include seams.

8.18.11 Interpretation

The average cut distance shall be used to determine pass/fail performance.

8.18.12 Procedure

Specimens shall be evaluated in accordance with ASTM F1790-99a. Test methods for measuring cut resistance of materials used in protective clothing, with the modification that specimens shall be tested to a specific load with the measurement of cut distance.

8.18.13 Report

The cut distance shall be recorded and reported to the nearest .1 mm (.01 in.) for each specimen.

The average cut distance in mm (in.) shall be calculated and reported for all specimens tested.

Supplemental Information

File Name: Additional_Stabilization_for_Pis_83_84_85.docx

Submitter Information Verification

Submitter Full Name: Dave Trebisacci

Organization: [Not Specified]

Street Address:

City:

State:

Zip:

Submit Date: 09/01/2015 21:28:32 EDT 2015

Committee Statement

Committee Statement:

Interface gaskets may be used on products to provide joints with eye/face protection devices or respirators or other ensemble elements with the garment. The nature of these materials requires that separate requirements be developed. Visor materials may also be used in the construction of some garments.

The proposed revisions are similar to those proposed for both NFPA 1992 and NFPA 1994.

Response:

Message: Public Input No. 85-NFPA 1999-2015 [Section No. 8.18]

Ballot Results

This item has passed ballot

15 Eligible Voters

2 Not Returned

13 Affirmative All

0 Affirmative With Comments

0 Negative With Comments

0 Abstentions

Not Returned:

Davis, James B.

Latan, Michael A.

Affirmative All:

Allen, Jason L.

Carroll, Sharon D.

Dawood, Todd P.

Finnan, William A.

Fithian, William A.

Harris, David R.

Havstad, R. Willard E.

Hilburn, Barry L.

Lancaster, Brett C.

Lattimore, Kari E.

Ellen, Philip C.

80 of 112 12/16/2015 2:25 PM
Additional Substantiation for PIs 83 84 85

Excerpt from “Physical Property Test Methods and Requirements” of “Testing and Validation Efforts to Improve NIJ 0116.00 on CBRNE Personal Protective Equipment” Report to National Institute of Justice dated 30 November 2014. Excerpt provides data supporting new proposed requirements for interface gaskets.

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† Hood gasket used in a representative NFPA 1994, Class 2 ensemble; material provided in a sheet form.
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(c) ASTM D412 Measurement of Ultimate Tensile Strength and Elongation

Figure 1 - Rubber Tear and Tensile Strength Tests

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In contrast to the tear and tensile tests, Material S1 showed a higher puncture resistance and greater cut resistance compared to material S2. The puncture resistance would be considered acceptable for garment materials but not glove materials according to NIJ 0116.00; however the cut resistance for material S2 could not meet the 200 gram criterion.

Garment gasket materials warrant their own set of physical property criteria that account for their intended function and limited areas as part of the overall ensemble. Puncture and cut resistance appear to be appropriate properties but a lower cut resistance criterion is needed to accommodate the NFPA 1994 Class 3 ensemble for which there have been no field complaints specifically for the durability/physical hazard resistance of the current gasket. A related ultimate tensile strength is also suggested to address material elasticity.
8.19 Abrasion Resistance Test One.

8.19.1 Application.
This test method shall apply to footwear soles.

8.19.2 Sample Preparation.
8.19.2.1 Samples shall be uniform cylinders of footwear soles and heel material as specified in ISO 4649, Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device.

8.19.2.2 Samples shall be conditioned as specified in 8.1.2.

8.19.3 Specimens.
8.19.3.1 Specimens shall be uniform cylinders of footwear soles and heel material as specified in ISO 4649, Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device.

8.19.3.2 At least three specimens shall be tested.

8.19.4 Procedure.
Abrasion resistance shall be performed in accordance with ISO 4649, Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using rotating cylindrical drum device, Method A, with a vertical force of 10 N over an abrasion distance of 40 m.

8.19.5 Report.
The relative volume loss of each specimen shall be recorded and reported.

8.19.6 Interpretation.
One or more footwear specimens failing this test shall constitute failing performance.
8.20 Slip Resistance Test.

8.20.1 Application.
This test method shall apply to footwear.

8.20.2 Sample Preparation.
8.20.2.1 Samples shall be the whole footwear in men's size 9D, medium width.

8.20.3 Specimens.
8.20.3.1 Specimens shall be the whole footwear in men's size 9D, medium width.
8.20.3.2 At least three specimens shall be tested.

8.20.4 Procedure.
Slip resistance shall be performed in accordance with ISO 13287, ASTM F2913, and shall be conducted in accordance with Table A.8.20.4(1) - Table A.8.20.4(4).

8.20.4.1 Footwear shall be tested both in the forepart and heel positions.

8.20.4.2 Footwear shall be tested in the wet condition.
The wet condition shall be achieved using distilled or deionized water. The water shall be applied to thoroughly wet the testing surface and make a pool at least as wide and long as the test portion of the footwear in the area of initial contact.

8.20.4.3 Footwear shall be tested on a quarry tile surface that meets the specifications of ASTM F2913 and shall be calibrated in accordance with ASTM F2913. The calibration frequency of 10 tests specified in ASTM F2913 shall be equivalent to 50 test runs. The quarry tile is a flat and unglazed clay tile that is wider than the test specimen and long enough to allow a sliding distance of at least 75 mm without crossing a joint. The quarry tile shall be long enough to allow a sliding distance of at least 75 mm without crossing a joint. The quarry tile is sufficiently flat to allow it to be secured on the mounting table such that no movement occurs between the tile and mounting table during the test. The quarry tile has a ribbed profile or directional marking on the underside to identify the direction in which the tile should be aligned (with the ribs parallel to the sliding direction). The quarry tile conforms to the coefficient of friction values specified in Table A.8.20.4(1) - Table A.8.20.4(4) when calibrated by the Slider 96 method.

8.20.4.4 The coefficient of friction shall be recorded for each configuration.

8.20.5 Report.
8.20.5.1 The coefficient of friction of each specimen shall be reported.
8.20.5.2 The average coefficient of friction of all specimens for each configuration shall be calculated, recorded, and reported.
8.20.5.3 Interpretation.
The average coefficient of friction for each configuration shall be used to determine pass/fail performance.

<table>
<thead>
<tr>
<th>Specimen</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>0.49</td>
</tr>
</tbody>
</table>

Committee Statement
This item is being updated for slip resistance text from ISO 13287 to ASTM F2913. During the last revision cycle of NFPA 1999 when the new slip test was adopted, it was the desire of the committee to follow the methodology of the ASTM committee for slip testing. However, at that time the ASTM method was not yet published. Therefore a hybrid method was used that combined ISO 13287 with elements of the ASTM F2913 draft document. This new method will be slightly different from what is currently being used. That is, the procedure of the specimen test is identical to slightly different; sanding and detergent (ASTM) vs. light sanding and solvent. In the actual testing a 0.1 ms (ASTM) vs. avg 0.1-0.3 ms (ISO) test is also being tested.

Ballot Results
This item has been passed.
15 Eligible Voters
2 Not Returned
12 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Absentee

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Hanna, David R.
Hendrick, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sublett, Jeff
8.23 Overall Liquid Integrity Test Four.

8.23.1 Application.
This test shall apply to protective footwear.

8.23.2 Samples.

8.23.2.1 A minimum of three footwear items shall be tested.

8.23.2.2 Samples for conditioning shall be whole footwear.

8.23.3 Specimen Preparation.
Specimens shall be conditioned as specified in 8.1.2.

8.23.4 Procedure.

8.23.4.1 Protective footwear shall be tested in accordance with FIA Standard 1209, Whole Shoe Flex, with the following modifications:
(1) Water shall not be used.
(2) The flex speed shall be 60 cycles/min ± 2 cycles/min.
(3) Alternative flexing equipment shall be permitted to be used when the flexing equipment meets the following parameters:
(a) The alternative flexing equipment shall be capable of providing the angle of flex as described in FIA 1209.
(b) The alternative flexing equipment shall be capable of a flex speed of 60 cycles/min ± 2 cycles/min.
(c) The alternative flexing equipment shall provide a means of securing the footwear during flexing.

8.23.4.2 The test shall consist of 100,000 flexes.

8.23.4.3 After flexing, the outer sole shall be examined for evidence of sole separation. Separation occurring in this test shall be recorded and reported if it is at least 1.4 mm × 18 mm (0.05 in. × 0.7 in.) in any orientation.

8.23.4.4 After flexing and observation for separation, the footwear specimen shall be marked with a water height line on the exterior at a height of 75 mm (3 in.) below the height of the boot as defined in 6.4.2.3.1 and 6.4.3.2.1, but no lower than 75 mm (3 in.) for multiple-use emergency medical footwear or no lower than 50 mm (2 in.) for multiple-use medical care facility footwear, where measured up from the center of the insole at the heel.

8.23.4.5 The measurement shall be made on the interior and transferred to the exterior. Plain white paper toweling shall be placed into the footwear specimen to at least the water height line.

8.23.4.6 The footwear specimen shall then be placed in a container that allows its immersion in tap water, treated with a dye and surfactant that achieves a surface tension of 35 dynes/cm ± 5 dynes/cm, to the water height line.

8.23.4.7 After 2 hours ± 10 minutes, the paper toweling shall be removed and examined for evidence of liquid leakage.

8.23.5 Report.
The outer sole separation or the appearance of water leakage on the removed paper toweling shall be recorded and reported as failure for the tested specimen.

8.23.6 Interpretation.
One or more footwear specimens failing this test shall constitute failing performance.
Permeation resistance shall be separately evaluated against the following chemicals:

1. A 40 ± 10 percent weight-for-weight (w/w) solution of glutaraldehyde
2. A 70 ± 10 percent w/w isopropanol
3. A 5 ± 1 percent solution of sodium hypochlorite
4. Peracetic acid with a minimum of 30 ± 10 percent acetic acid
8.26.3.2
Glove pair specimens shall be preconditioned as specified in 8.1.2.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Sep 01 21:55:09 EDT 2015

Committee Statement
Committee Statement: The TC is making an editorial change.
Response Message:

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

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freidson, Patricia A.
Harris, David R.
Haskell, III, William E.
Henderson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Stalter, Jeff

8.26.6.1 The average percent of barehanded control shall be recorded and reported for each test subject.

8.26.6.2 The average percent of barehanded control for all test subjects shall be calculated and reported for each size.

8.26.7 Interpretation.

The average percent of barehanded control for size small and size large shall be used to determine pass or fail performance.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: Not Specified
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Sep 02 09:39:39 EDT 2015

Committee Statement

Committee Statement: The TC proposes to use the average for each size to determine pass/fail performance instead of an overall average of both sizes. Averaging both sizes can take a problem with one size. This also is consistent with the way the pass/fail performance is determined in NFPA 1971 and NFPA 1951.

Response Message:

Public Input No. 35-NFPA 1999-2015 [Sections 8.26.6, 8.26.7]

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Against
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fidler, William A.
Freeman, Patricia A.
Harris, David R.
Hendel, B. William E.
Henderson, Barry L.
Lancaster, Scott C.
Lampton, Kevin S.
Mann, Philip C.
Patrick, Richard W.
Suiter, Jeff
Grip testing shall be evaluated with the use of a torque meter, Standard Test Method for Characterizing Gripping Performance of Gloves Using a Torque Meter, or as specified in the glove manufacturer's literature.

The testing procedures shall be as specified in ASTM F2961, Standard Test Method for Characterizing Gripping Performance of Gloves Using a Torque Meter, or as specified in the glove manufacturer's literature.

Sample Preparation.

Glove pair specimens shall be tested in new, as-distributed condition. Each glove pair shall be tested as a complete set of gloves in new, as-distributed condition.

Glove pair specimens shall be tested after being conditioned for dry conditions as specified in Table 8.27.7.1.

Glove pair specimens shall be tested after being conditioned for wet conditions as specified in Table 8.27.7.2.

Two test subjects, one for hand size small as determined using the glove size dimensions in EN 420, shall be utilized for this test.

A minimum of three glove pairs each for small and large sizes shall be used for testing.

A minimum of three glove pairs each for small and large sizes shall be used for testing.

Glove pair specimens shall not receive special softening treatments prior to tests.

Glove pair specimens shall be tested by material and construction combination.

Glove pair specimens shall be tested for each material and construction combination.

Glove pair specimens shall not receive special softening treatments prior to tests.

Each test subject shall test a minimum of three pairs of sample gloves using the method specified in 8.27.6.1. Each test subject shall test a minimum of three pairs of sample gloves using the method specified in 8.27.6.1.

Each test subject shall test a minimum of three pairs of sample gloves using the method specified in 8.27.6.1.

Each test subject shall test a minimum of three pairs of sample gloves using the method specified in 8.27.6.1.

Each test subject shall test a minimum of three pairs of sample gloves using the method specified in 8.27.6.1.

The testing procedure shall be as specified in ASTM F2961, Standard Test Method for Characterizing Gripping Performance of Gloves Using a Torque Meter, or as specified in the glove manufacturer's literature.

Each test subject shall test a minimum of three pairs of sample gloves using the method specified in 8.27.6.1.

Each test subject shall test a minimum of three pairs of sample gloves using the method specified in 8.27.6.1.

Each test subject shall test a minimum of three pairs of sample gloves using the method specified in 8.27.6.1.

Each test subject shall test a minimum of three pairs of sample gloves using the method specified in 8.27.6.1.

The percentage of barehanded control value shall be calculated as follows:

\[
\text{Percentage of barehanded control value} = \left( \frac{F_{\text{g}}}{F_{\text{c}}} \right) \times 100
\]

where:
- \( F_{\text{g}} \) = average pulling force with gloves
- \( F_{\text{c}} \) = barehanded control value

The percent of barehanded control shall be recorded and reported for each test subject.

The percent of barehanded control shall be recorded and reported for each test subject.

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The percent of barehanded control shall be recorded and reported for each test subject.
8.29.1 Application. This test method shall apply to work gloves that are not configured with either single-use emergency medical examination gloves or single-use emergency medical cleaning/utility gloves.

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 Sep 02 12:30:34 EDT 2015

Committee Statement
Committee Statement: Additional flexibility is needed to permit the design of durable gloves for use with ensembles where gloves may be temporarily or permanently attached to the garment sleeve portion of full ensembles. The proposed revision provides for an outer glove that protects rugged physical performance that covers an inner glove or liner that offers the barrier protection against biological hazards.

Response Message
Public Input No. 54-NFPA 1999-2015 [Section No. 8.29.1]

Ballot Results
This item has passed ballot
15 Eligible Voters
13 Affirmative All
2 Not Returned
0 Affirmative with Comments
0 Negative with Comments
0 Absent

Not Returned
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Hendel, K. William E.
Henderson, Barry L.
Lansden, Beth C.
Larson, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadtler, Jeff
8.30 Tactility Test.

8.30.1 Application.

8.30.1.1 This test shall apply to cleaning/utility gloves and work gloves.

8.30.1.2 Modifications to this test method for testing cleaning/utility gloves shall be as specified in 8.30.7.

8.30.1.3 Modifications to this test method for testing work gloves shall be as specified in 8.30.8.

8.30.2 Specimens.

8.30.2.1 A minimum of three glove pairs each for two different sizes shall be used for testing.

8.30.2.2 Each glove pair shall be tested as a complete set of gloves in new, as-distributed condition.

8.30.2.3 Glove pair specimens shall not receive special softening treatments prior to tests.

8.30.3 Sample Preparation.

8.30.3.1 Samples for conditioning shall be whole glove pairs.

8.30.3.2 Glove pair specimens shall be conditioned as specified in 8.1.2.

8.30.4 Procedures.

8.30.4.1 A separate test subject shall be used for each size pair of gloves to be evaluated.

8.30.4.2 Test subjects shall be selected such that their hand dimensions conform to the offered respective sizes for each glove.

8.30.4.3 Ten metal pins having diameters of 11 mm (0.430 in.), 9.5 mm (0.370 in.), 8 mm (0.310 in.), 6.5 mm (0.260 in.), 5 mm (0.197 in.), 2.5 mm (0.098 in.), 1.5 mm (0.059 in.), 1 mm (0.039 in.) and 0.5 mm (0.018 in.), which have a length of 50 mm ± 10 mm (2 in. ± 0.4 in.), shall be used.

8.30.4.4 With each of the metal pins lying on a flat, smooth surface at a spacing of 100 mm ± 20 mm (4 in. ± 0.8 in.), the test subject shall attempt to grasp up each pin starting with the largest diameter pin. The test subject shall be provided a period of 15 seconds to complete picking up each pin and then shall hold the pin for a minimum of 10 seconds. The test subject shall not pick up the pins by their ends.

8.30.5 Report.

8.30.5.1 The diameter of the smallest pin that can be successfully picked up shall be recorded and reported for each test subject.

8.30.5.2 The average diameter that can be successfully picked up by all test subjects shall be calculated and reported for each size.

8.30.6 Interpretation.

The average diameter of the smallest pin that can be picked up for each size shall be used to determine pass/fail performance.

8.30.7 Specific Requirements for Testing Cleaning/Utility Gloves.

The sizes selected for testing shall represent the smallest and largest sized gloves that are available for the specific style of glove being evaluated.

8.30.8 Specific Requirements for Testing Work Gloves.

Size small and size large shall be evaluated.
8.33.7.1

Samples for conditioning shall be complete garments at least 1 m$^2$ (1 yd$^2$) of material.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 02 15:08:43 EDT 2015

Committee Statement

Committee Statement:
NFPA 1999 as currently written requires material samples for testing be cut from whole garments which have been preconditioned. This causes manufacturers to subject multiple garments simply to provide enough yardage for the labs to be able to cut the correct sample sizes. There is precedence for this in NFPA 1999 of both lot sample acceptance and unit parameters testing are performed on material purchased and stock in the lab. The labs themselves should be able to perform the prep work if need be. As such, the testing as written above should be changed to say condition whole garments. There is precedent in NFPA 1999 for cutting all sample pieces in yardage from whole garments. There is no precedent in the testing methods specified in NFPA 1999 for conditioning samples to be cut from whole garments. Many of the garments currently certified to 1999 are also dual certified to NFPA 1951, which requires the testing to be done on whole genuine materials that have been preconditioned and then again on preconditioned garment materials. NFPA 1999 is the only NFPA standard that currently requires material samples be cut from whole garments.

Response

Message:

Ballot Results

This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned
Davis, James E.
Laton, Michael A.
Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Haskell, III, William E.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadler, Jeff
8.34.6.1

Test chamber shall have an aerosol generator capable of maintaining the aerosol mass concentration as specified in the procedure.

8.34.6.2

The test chamber shall have a system capable of providing a stable, uniform airflow directed at the test subject.

8.34.6.3

The test chamber shall have an aerosol generator capable of maintaining the aerosol mass concentration as specified in the procedure.

8.34.6.4

The test chamber shall be stabilized with the following conditions:

- Temperature shall be 70°F ± 5°F.
- Average wind speed shall be 3 mph ± 2 mph at the fan outlet airflow station.
- Relative humidity shall be 45 percent ± 15 percent.
- Average aerosol concentration shall be 20 mg/m³.
- Aerosol aerodynamic mass median diameter shall be 2.5 μm ± 0.5 μm.

8.34.7

Test subjects shall be familiar with the use of chemical protective ensembles and with the selected respirator.

8.34.7.1

Test subjects shall be provided with the opportunity to wear the selected ensemble prior to the test to ensure proper fit and function.

8.34.7.2

Test subjects shall be provided with the opportunity to don and doff the selected ensemble prior to the test to ensure proper comfort and function.

8.34.7.3

Test subjects shall be provided with the opportunity to wear the selected respirator prior to the test to ensure proper fit and function.

8.34.7.4

Test subjects shall be provided with the opportunity to don and doff the selected respirator prior to the test to ensure proper comfort and function.

8.34.7.5

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.6

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.7

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.8

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.9

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.10

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.11

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.12

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.13

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.14

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.15

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.16

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.17

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.18

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.19

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.20

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.21

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.22

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.23

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.24

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.25

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.26

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.27

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.28

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.

8.34.7.29

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper fit, function, and comfort.

8.34.7.30

Test subjects shall be provided with the opportunity to wear the selected ensemble and respirator prior to the test to ensure proper comfort and function.
Committee Statement

The Correlating Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1984. This change will allow requirements in NFPA 1984 to be moved to NFPA 1986 as suggested in Class 4. Proposed changes to NFPA 1986 will also include language in the scope, referenced test methods, definitions, design criteria, performance criteria, test methods, and appendix pertaining to CBRN requirements. A separate statement has been added to the Annex in A.1.1.4 to indicate that CBRN requirements will be addressed in NFPA 1986. Associated annex material will also be deleted.

Response Message

Ballot Results

- This item has passed ballot

  15 Eligible Voters
  2 Not Returned
  13 Affirmative All
  0 Affirmative with Comments
  0 Negative with Comments
  0 Abstentions

Not Returned

- Davis, James E.
- Laton, Michael A.

Affirmative All

- Allen, Jason L.
- Corrado, Steven D.
- Davis, Todd P.
- Fithian, William A.
- Freeman, Patricia A.
- Harris, David R.
- Haskell, III, William E.
- Hickerson, Barry L.
- Lancaster, Beth C.
- Lehtonen, Karen E.
- Mann, Philip C.
- Patrick, Richard W.
- Quintero, Jeff
Standard Test Method for Liquid Penetration Resistance Integrity of Protective Clothing or Protective Ensembles Under a Shower Spray While on a Mannequin

8.35.1 Scope
This test method shall apply to entire ensembles that are being evaluated for the [C]BRN terrorism agent protection.

8.35.2 Apparatus

8.35.2.1 The apparatus and supplies for testing shall be those specified in ASTM F 1359, Standard Test Method for Liquid Penetration Resistance Integrity of Protective Clothing or Protective Ensembles Under a Shower Spray While on a Mannequin, with the following modifications:

- The alternative flexing equipment shall provide a means of securing the footwear during flexing.
- The alternative flexing equipment shall be capable of providing the angle of flex as described in FIA 1209.
- The alternative flexing equipment shall provide a means of ensuring the footwear during flexing.

8.35.2.2 Water shall not be used.

8.35.3 Specimens

8.35.3.1 Specimens, except footwear, to be tested shall be conditioned as specified in ASTM F 1359, Standard Test Method for Liquid Penetration Resistance Integrity of Protective Clothing or Protective Ensembles Under a Shower Spray While on a Mannequin. The size of the items comprising the specimens shall be chosen to conform with the dimensions of the mannequin for proper fit and to comply with the manufacturer's sizing system. The size of the items comprising the specimen shall be the same size as the mannequin in terms of chest circumference, waist circumference, and inseam height.

8.35.3.2 Samples to be conditioned shall be complete ensembles.

8.35.3.3 A minimum of three specimens shall be tested. Specimens shall consist of entire ensembles for [C]BRN terrorism agent protection.

8.35.4 Procedure

8.35.4.1 The suited mannequin shall be exposed to the liquid spray for a total of 20 minutes, 5 minutes in each of the four mannequin orientations.

8.35.4.2 The liquid absorptive garment, inner cotton gloves, and inner cotton socks worn on the mannequin shall be inspected to determine any liquid leakage as detected on the liquid-absorptive garment and the interior of the garment.

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

8.35.4.4 The method used for mounting of the mannequin in the spray chamber shall not interfere with the water spray.

8.35.4.5 No provision for partial garments shall be permitted.

8.35.5 Reporting

8.35.5.1 Any evidence of liquid on the liquid-absorptive garment, as determined by visual, tactile, or absorbent toweling, shall constitute failure of the specimen.

8.35.5.2 A diagram shall be prepared for each test that identifies the locations of any liquid leakage as detected on the liquid-absorptive garment and the interior of the garment.

8.35.6 Interpretation

This test method shall apply to entire ensembles that are being evaluated for the [C]BRN terrorism agent protection.

8.35.7 Evaluation

This item has passed ballot

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8.36 Biopenetration Resistance Test Three.

8.36.1 Application.

8.36.1.1 This method shall apply to the [C]BRN barrier layer and seams used in elements and ensembles for [C]BRN terrorism agent protection.

8.36.1.2 Specific requirements for testing the garment, hood, and bootie [C]BRN barrier layer shall be as specified in 8.36.7.

8.36.1.3 Specific requirements for testing the garment, hood, and bootie [C]BRN barrier layer seams shall be as specified in 8.36.8.

8.36.1.4 Specific requirements for testing the glove [C]BRN barrier layer and seams shall be as specified in 8.36.9.

8.36.1.5 Specific requirements for testing footwear [C]BRN barrier layer shall be as specified in 8.36.10.

8.36.2 Sample Preparation.

Specimens shall then be conditioned at a temperature of 21°C ± 3°C (70°F ± 5°F) and at a relative humidity of 65 percent ± 5 percent, for at least 4 hours prior to permeation testing.

8.36.3 Specimens.

8.36.3.1 A minimum of three specimens of each material shall be tested against each chemical.

8.36.3.2 The [C]BRN barrier layers shall be tested for viral penetration resistance.

8.36.3.3 The [C]BRN barrier layer plus any outer shell or other composite layers normally worn over the [C]BRN barrier layer shall be tested for viral penetration resistance. Separable layers worn underneath the [C]BRN barrier layer shall not be tested with the [C]BRN barrier layer.

8.36.3.4 If the [C]BRN barrier layer is the outermost layer in the composite, then it shall be tested for viral penetration resistance without additional layers on top.

8.36.4 Procedure.

Liquid penetration resistance testing shall be conducted in accordance with ASTM F 1671, Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Blood-Borne Pathogens Using Phi-X174 Bacteriophage Penetration as a Test System.

8.36.5 Report.

The pass/fail result for each specimen shall be recorded and reported.

8.36.6 Interpretation.

A failure of any specimen constitutes failure of the material.

8.36.7 Specific Requirements for Testing Garment, Hood, and Bootie Materials.

8.36.7.1 Samples for conditioning shall be at least 380 mm (15 in.) square and shall consist of all layers of the composite arranged in the order used in the construction of the garment, hood, or bootie.

8.36.7.2 Composite samples prepared as described in 8.36.7.1 shall be tested after being twice subjected to the conditioning as specified in 8.1.3.

8.36.7.3 The composite sample, including [C]BRN barrier layer, that was conditioned in 8.36.7.2 shall be trimmed to a sample size of 300 mm × 280 mm (12 in. × 11 in.). The trimmed composite samples shall be subject to flexing conditioning as specified in 8.1.10, with the 280 mm (11 in.) direction parallel with the compression action of the machine. The trimmed samples shall be mounted such that outer layer is visible with all layers in their normal "as worn" orientation.

8.36.7.4 Following flexing, samples of the [C]BRN barrier layer shall be removed from the flexed, trimmed composite sample and shall be cut to the dimensions shown in Figure 8.36.7.4, with the long dimension of the sample parallel to the 280 mm (11 in.) dimension.

Figure 8.36.7.4 Specimen Configuration.

8.36.7.5 The layers in the flexed, trimmed composite sample adjacent to the [C]BRN barrier layer shall be retained for use as the abradants.

8.36.7.6 The [C]BRN barrier layer samples prepared as specified in 8.36.7.4 and the other samples retained as specified in 8.36.7.5 shall be subjected to abrasion as specified in 8.1.11.

Following abrading, the viral penetration test specimen shall be taken from the center of the abraded sample so that the center of the viral penetration test and the center of the abraded sample coincide.

8.36.8 Use of exterior layers with the [C]BRN barrier layer specimens shall be permitted. Exterior layer specimens shall be removed from the composite samples that are conditioned as specified in 8.36.7.2.
8.1.9.1

Alternative flexing equipment shall be permitted to be used when the flexing equipment meets the following parameters:

- The alternative flexing equipment shall provide a means of securing the footwear during flexing.
- The alternative flexing equipment shall be capable of providing the angle of flex as described in FIA 1209.
- The alternative flexing equipment shall provide a means of combining the stepwise flexing actions.
- The alternative flexing equipment shall provide a means of protecting the specimen from the flexing equipment.

8.1.10

The Correlating Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1994. Proposed changes to NFPA 1999 remove all language in the scope, referenced test methods, definitions, design criteria, performance criteria, test methods, and appendix pertaining to CBRN requirements. A separate statement has been added to the Annex in A.1.1.4 to indicate that CBRN requirements are addressed in NFPA 1994.
8.35 Tear Resistance Test Two.

8.35.1 Application.
This test shall apply to materials used in the construction of garments. Where the garment is constructed of several separable layers, each separable layer of garment material shall be tested.

8.35.2 Specimens.
8.35.2.1 Five specimens in each of the warp and fill directions shall be tested for each material.
8.35.2.2 Specimens shall be prepared in accordance with ASTM D 5733, Standard Test Method for Tearing Strength of Nonwoven Fabrics by the Trapezoid Procedure.

8.35.3 Sample Preparation.
8.35.3.1 Samples for conditioning shall be complete garments.
8.35.3.2 Garment samples shall be conditioned as specified in 8.1.2.

8.35.4 Procedure.
Specimens shall be tested in accordance with ASTM D 5733, Standard Test Method for Tearing Strength of Nonwoven Fabrics by the Trapezoid Procedure.

8.35.5 Report.
8.35.5.1 The tear strength of an individual specimen shall be the average of the five highest peak loads of resistance registered for mm (in.) of separation of the tear.
8.35.5.2 The tear strength of each specimen shall be recorded and reported to the nearest 0.5 N (0.1 lbf).
8.35.5.3 An average tear strength shall be calculated and reported for warp and fill directions.

8.35.6 Interpretation.
8.35.6.1 Pass/fail performance shall be based on the average tear strength in the warp and fill directions.
8.35.6.2 Failure in any one direction constitutes failure for the material.
Samples for conditioning shall be the entire complete garment or at least 1 sq m (1 yd²) of material.

Committee Statement
NFPA 1999 as currently written requires material samples for testing be cut from whole garments which have been preconditioned. This causes manufacturers to submit multiple garments, simply to provide enough yardage for the labs to be able to cut the correct sample sizes. There is precedence for this in NFPA 1999 of both water absorption and viral penetration testing being performed on material yardage that has been preconditioned, rather than on whole garments. Many of the garments currently certified to 1999 are also dual certified to NFPA 1951, which requires the testing to be done both on whole garments that have been preconditioned and then again on preconditioned garment materials. NFPA 1999 is the only NFPA standard that currently requires material samples be cut from whole garments.

Ballot Results
This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions

Not Returned:
Davis, James E.
Laton, Michael A.
Affirmative All:
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harris, David R.
Hickerson, Barry L.
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Patrick, Richard W.
Sadtler, Jeff
Fastener Tape Strength Test.

8.39.1 Application.
This test shall apply to fastener tape used in the construction of garments.

8.39.2 Samples.
8.39.2.1 Sample size shall be defined in the A-A 55126B, Commercial Item Description, Fastener Tapes, Hook and Loop, Synthetic.
8.39.2.2 Samples shall be washed for three washings as specified in AATCC 61, Colorfastness to Laundering, Home and Commercial: Accelerated, using the laundering conditions established for Test 3A.

8.39.3 Specimens.
A minimum of four specimens shall be evaluated.

8.39.4 Procedures.
8.39.4.1 Fastener tape breaking strength shall be measured in accordance with ASTM D5034, Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test), with the following modifications:
(1) Specimens shall be tested in the provided width only in lieu of the specified 100 mm (3.9 in.) width.
(2) Only specimens parallel to the length of the tape shall be tested.
8.39.4.2 Fastener tape shear strength shall be measured in accordance with ASTM D5169, Standard Test Method for Shear Strength (Dynamic Method) of Hook and Loop Touch Fasteners,
8.39.4.3 Fastener tape shear strength shall be measured in accordance with ASTM D5170, Standard Test Method for Peel Strength ("T" Method) of Hook and Loop Touch Fasteners.

8.39.5 Report.
The average breaking strength, shear strength, and peel strength shall be calculated and recorded.

8.39.6 Interpretation.
Pass or fail determinations shall be based on the average breaking strength, shear strength, and peel strength specified for Type 2, Class 1 and 4 fastener tapes, as established in Table 1 of A-A 55126B, Commercial Item Description, Fastener Tapes, Hook and Loop, Synthetic.

Submitter Information Verification
Submitter Full Name: Dave Trebisacci
Organization: [Not Specified]
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Sep 01 10:08:10 EDT 2015

Committee Statement
Committee Statement: The current criteria for hook and loop closure tape are awkward in specifying a limited set of criteria from the referenced commercial item specification. The proposed revision adopts the same approach used for hook and loop closure tape that is applied in both NFPA 1951 and NFPA 1971.

Response Message:
Public Input No. 58-NFPA 1999-2015 [New Section after 8.42]

Ballot Results
This item has passed ballot
15 Eligible Votes
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned:
Davis, James E.
Laton, Michael A.
Affirmative All:
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fitch, William A.
Freeman, Patricia A.
Harr, David A.
Hensel, R. William E.
Hindman, Barry L.
Lanard, Scott C.
Lentz, Karen E.
Minn, Philip C.
Patrick, Richard W.
Sallie, Jeff
8.40 Overall Ensemble Function Test.

8.40.1 Application.
This test method shall apply to ensembles.

8.40.2 Sample Preparation.

8.40.2.1 Samples shall be complete ensembles.

8.40.2.2 Ensemble garments and all other ensemble elements that are subject to laundering shall be conditioned as specified in 8.1.3.

8.40.2.3 All other ensemble elements shall be conditioned as specified in 8.1.2.

8.40.3 Specimens.

8.40.3.1 Specimens shall be complete ensembles.

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

8.40.3.3 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.

8.40.4 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, 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 the placard relative to the test subject
4. An NFPA 704-based placard as seen in Figure 8.40.4 (NFPA Placard).

8.40.5 Procedure.

8.40.5.1 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, 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 of ASTM F1154. 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 underclothing in accordance with the manufacturer's recommendations, or in lieu of a detailed recommendation, a full body coverall.

8.40.5.2 Visual acuity testing shall be conducted using the eye chart, with a normal lighting range of 100 through 150 ft candles at the chart and with the test subject positioned at a distance of 6.1 m (20 ft) from the chart.

8.40.5.2.1 The test subject shall have a minimum visual acuity of 20/20 in each eye, uncorrected or corrected with contact lenses, as determined in a visual acuity test or doctor's examination.

8.40.5.2.2 The test subject shall read the standard eye chart through the facepiece, visor, or eye/face protection device to determine its impact on the test subject's visual acuity.

8.40.5.3 The field of vision for the test subject shall be assessed by determining the angular degree to the left and right where a word of four random letters 10 mm (0.4 in.) high from a distance of 6 m (20 ft) that is 2 m (6 ft) off of the ground.

8.40.6 Report.

8.40.6.1 The measure of the ability of the test subject to complete all exercises shall be measured and reported.

8.40.6.2 The visual acuity of the test subject when in and out of the ensemble shall be recorded and reported.

8.40.6.3 The angular degree for both the left and right defining the field of vision shall be measured and reported. The average angular degree for the left and right field of vision for all test subjects shall be calculated and reported.

8.40.7 Interpretation.

8.40.7.1 The ability of the test subject to fully complete all exercises shall be measured and reported.

8.40.7.2 The visual acuity of the test subject when in and out of the ensemble shall be recorded and reported.

8.40.7.3 The average left and average right angular field of vision shall be used for determining pass or fail performances.

8.41 Visor Drop Ball Impact Resistance Test.

8.41.1 Application.

8.41.1.1 This test shall apply to visor materials.

8.41.2 Sample Preparation.

8.41.2.1 Samples shall be at least 2 m$^2$ (2 yd$^2$) of material.

8.41.3 Procedure.

8.41.3.1 Visual acuity testing shall be conducted using the eye chart, with a normal lighting range of 100 through 150 ft candles at the chart and with the test subject positioned at a distance of 6.1 m (20 ft) from the chart.

8.41.3.2 The test subject shall have a minimum visual acuity of 20/20 in each eye, uncorrected or corrected with contact lenses, as determined in a visual acuity test or doctor's examination.

8.41.3.3 The test subject shall read the standard eye chart through the facepiece, visor, or eye/face protection device to determine its impact on the test subject's visual acuity.

8.41.3.4 The field of vision for the test subject shall be assessed by determining the angular degree to the left and right where a word of four random letters 10 mm (0.4 in.) high from a distance of 6 m (20 ft) that is 2 m (6 ft) off of the ground.

8.41.4 Report.

8.41.4.1 The measure of the ability of the test subject to fully complete all exercises shall be measured and reported.

8.41.4.2 The visual acuity of the test subject when in and out of the ensemble shall be recorded and reported.

8.41.4.3 The average left and average right angular field of vision shall be used for determining pass or fail performances.

8.41.5 Interpretation.

8.41.5.1 The ability for the test subject to fully complete all exercises shall be measured and reported.

8.41.5.2 The visual acuity of the test subject when in and out of the ensemble shall be recorded and reported.

8.41.5.3 The average left and average right angular field of vision shall be used for determining pass or fail performances.
8.4.1.2 Samples shall be conditioned as specified in 8.1.2.

8.4.1.3 Specimens.

8.4.1.3.1 Specimens shall be 450 mm × 305 mm.

8.4.1.3.2 A minimum of five specimens shall be tested.

8.4.1.4 Procedure. Specimens shall be tested in accordance with Section 9.6 of ANSI Z87.1, American National Standard for Occupational and Educational Protective Eye and Face Protective Devices, with the following modifications:

8.4.1.4.1 Visor material shall be securely mounted to test fixture shown in Figure 8.41.4.1(a) and Figure 8.41.4.1(b).

Figure 8.41.4.1 Fixtures for Positioning Visor Material for Impact Resistance Testing.

Clamping plate
Visor material
152 mm radius

Min
150 mm

Visor holder, end view.

305 mm outside to outside
Visor material
25 mm thick steel
clamping plate
25 mm thick steel

Visor holder, side view.

8.4.1.4.2 Sample number shall be as indicated above.

8.4.1.4.3 Impact location shall be in the center of the visor.

8.4.1.5 Report. Visible penetration or full thickness cracks shall be recorded and reported.

8.4.1.6 Interpretation. Penetration or full thickness cracking on any single impact shall used to determine compliance.

Supplemental Information

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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 Sep 01 21:01:59 EDT 2015

Committee Statement

Committee Statement: Some form of functional analysis is needed to evaluate the performance of ensembles. The suggested test is adapted from NFPA 1982 and should be further modified to address the specific issues of emergency medical response for operations involving highly infectious diseases.

The proposed test is based on requirements taken from ANSI Z87.1 for eye and face protection to provide an equivalent level of protection for the eye and face to demonstrate adequate physical strength. This requirement has been proposed for both single and multiple use ensembles; however, additional work by the Technical Committee will be undertaken to determine if different variations of the test or criteria should be applied to each type of garment visor.

Response Message

Response Message: This item has passed ballot.

Ballot Results

- Ballot Results
  - Total Votes: 15
  - Eligible Votes: 15
  - Not Returned: 2
  - Affirmative All: 13
  - Affirmative with Comments: 0
  - Negative with Comments: 0
  - Absent: 0

Confidentiality Statement

Confidentiality Statement: No comments.
NFPA 1999, Figure 8.45.4 (b)
NFPA 1999, Figure 8.45.4 (a)
Evaporative Resistance Test

8.42.1 Scope

This test method applies to protective garment composites.

8.42.2 Terminology

See Terminology F1882 for definitions of terms specific to a protective garment composite.

8.42.3 Principle

Evaporative resistance testing shall be conducted on each tested specimen.

8.42.4 Apparatus


8.42.5 Specimens

The minimum sample size shall be 51 cm × 51 cm (20 in. × 20 in.).

8.42.6 Procedure

Specimens shall consist of all layers in the emergency medical protective garment composite, arranged in the order and orientation as worn.

8.42.7 Results

8.42.7.1 Interpretation

The average total evaporative resistance (Ret) of all tested samples shall be recorded and reported.

The total evaporative resistance (Ret) shall be calculated by dividing the total heat flux (HF) by the total evaporative heat loss (ETL). Ret is calculated using the following formula:

\[ \text{Ret} = \frac{\text{HF}}{\text{ETL}} \]

Where:

- **HF** = Heat Flux (W/m²)
- **ETL** = Evaporative Heat Loss (W/m²)

8.42.8 Report

8.42.8.1 Report statement

The results of the evaporative resistance test shall be recorded and reported.

8.42.8.2 Report statement

The average total evaporative resistance (Ret) of all tested samples shall be recorded and reported.

8.42.8.3 Interpretation

The total evaporative resistance (Ret) shall be calculated by dividing the total heat flux (HF) by the total evaporative heat loss (ETL). Ret is calculated using the following formula:

\[ \text{Ret} = \frac{\text{HF}}{\text{ETL}} \]

Where:

- **HF** = Heat Flux (W/m²)
- **ETL** = Evaporative Heat Loss (W/m²)

If an individual result from any test set varies more than ±10 percent from the average result, the results from the test set shall be discarded and another set of specimens shall be tested.

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Committee Statement

The environmental conditions that first responders face are complex and diverse. Total heat loss (THL) is a very good test for evaluating the ability of materials to manage heat stress but it only evaluates three properties at one condition (77°F, 65% RH). Thus, the THL test does not reflect the full extent of the range of conditions that materials may be expected to manage. Evaporative resistance testing is conducted at various conditions that THL, 95°F, 40% RH. Therefore, THL values help to provide some of that insight. Further the justification goes on to explain that RET is part of the same ASTM test method as THL, using the same test plate and guard surrounding the test plate.

The proposed maximum level of 20 is based on research reported in Umbach, K.H., Functional weather protective clothing with good cooling properties, triathlete two-temperature reports, 67 (1986), 277-280. This work correlated test subject responses with garments constructed in a range of evaporative resistance with the finding that garments having a range of Ret from 13 to 20 Pa•m²/W were found to be satisfactory or breathable. Though ventilated at a high activity rate, the proposed maximum level of 20 is based on research reported in Umbach, K.H., Functional weather protective clothing with good cooling properties, triathlete two-temperature reports, 67 (1986), 277-280. This work correlated test subject responses with garments constructed in a range of evaporative resistance with the finding that garments having a range of Ret from 13 to 20 Pa•m²/W were found to be satisfactory or breathable. Though ventilated at a high activity rate, the proposed maximum level of 20 is based on research reported in Umbach, K.H., Functional weather protective clothing with good cooling properties, triathlete two-temperature reports, 67 (1986), 277-280. This work correlated test subject responses with garments constructed in a range of evaporative resistance with the finding that garments having a range of Ret from 13 to 20 Pa•m²/W were found to be satisfactory or breathable. Though ventilated at a high activity rate.

Some justifications for the test equipment. There has been little discussion about the THL test with very rarely, and so it is published in another test. The justification cites research done in 1986, about 30 years ago and well before the THL requirements were added to the standard. Further, the justifications cite research that explains that THL is part of some ASTM test method on THL, using the same test equipment and part are from the THL test that was adopted into the standard some years ago. As proposed the THL test adds a thermal condition (95°F, 40% RH) and while I agree that emergency responders are many, many, different conditions, I am not sure why this one condition is more important or probable than any other. Under normal clothing, EMS workers do not require a moisture management and evaporative heat loss protection (95°F, 40% RH). Thus, EMS workers use require and specify much higher THL values, without the consequence of loss of thermal protection.
Specific criteria for CBRN protective ensembles, as addressed in NFPA 1999 for the 2013 and 2008 editions, were moved to NFPA 1994. NFPA 1998 established requirements for biological/radiological particulate protection as part of the Class 4 requirements. NFPA 1994-2012 specified criteria for single-use CBRN protective ensembles. However, the 2017 edition of the standard includes CBRN protection criteria for both single and multiple-use protective ensembles.

Criteria for protection from hazardous materials are provided in the following standards:

3. NFPA 1993, Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents
4. NFPA 1994, Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents
5. NFPA 1995, Standard on Fire Protection for CBRN Terrorism Incidents
6. NFPA 1999, Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents
7. NFPA 2000, Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents

Specific criteria addressing respiratory protection are not covered in this standard. However, responders and rescuers that are engaged in emergency medical operations involving dermal pathogens or other respiratory hazards should wear appropriate respiratory protection. At a minimum, appropriate respiratory protection should include filtering facepieces that are certified by the National Institute for Occupational Safety and Health (NIOSH) as CBRN filtering facepieces (CBRN FFPs) or as respirators that meet the requirements of NIOSH 42 CFR Part 84. In addition, responders and rescuers engaged in operations involving CBRN hazards should, as a minimum, wear air-purifying respirators that are certified by NIOSH as CBRN air-purifying respirators (CBRN APRs) or certified by NIOSH as CBRN powered air-purifying respirators (CBRN PAPRs). Specific criteria for CBRN protective ensembles are not covered in this standard. However, responders and rescuers that are engaged in emergency medical operations involving dermal pathogens or other respiratory hazards should wear appropriate respiratory protection.

Specific criteria addressing respiratory protection are not covered in this standard. However, responders and rescuers engaged in emergency medical operations involving dermal pathogens or other respiratory hazards should wear appropriate respiratory protection. At a minimum, appropriate respiratory protection should include filtering facepieces that are certified by the National Institute for Occupational Safety and Health (NIOSH) as CBRN filtering facepieces (CBRN FFPs) or as respirators that meet the requirements of NIOSH 42 CFR Part 84. In addition, responders and rescuers engaged in operations involving CBRN hazards should, as a minimum, wear air-purifying respirators that are certified by NIOSH as CBRN air-purifying respirators (CBRN APRs) or certified by NIOSH as CBRN powered air-purifying respirators (CBRN PAPRs).

Specific criteria addressing respiratory protection are not covered in this standard. However, responders and rescuers engaged in emergency medical operations involving dermal pathogens or other respiratory hazards should wear appropriate respiratory protection. At a minimum, appropriate respiratory protection should include filtering facepieces that are certified by the National Institute for Occupational Safety and Health (NIOSH) as CBRN filtering facepieces (CBRN FFPs) or as respirators that meet the requirements of NIOSH 42 CFR Part 84. In addition, responders and rescuers engaged in operations involving CBRN hazards should, as a minimum, wear air-purifying respirators that are certified by NIOSH as CBRN air-purifying respirators (CBRN APRs) or certified by NIOSH as CBRN powered air-purifying respirators (CBRN PAPRs).

Specific criteria addressing respiratory protection are not covered in this standard. However, responders and rescuers engaged in emergency medical operations involving dermal pathogens or other respiratory hazards should wear appropriate respiratory protection. At a minimum, appropriate respiratory protection should include filtering facepieces that are certified by the National Institute for Occupational Safety and Health (NIOSH) as CBRN filtering facepieces (CBRN FFPs) or as respirators that meet the requirements of NIOSH 42 CFR Part 84. In addition, responders and rescuers engaged in operations involving CBRN hazards should, as a minimum, wear air-purifying respirators that are certified by NIOSH as CBRN air-purifying respirators (CBRN APRs) or certified by NIOSH as CBRN powered air-purifying respirators (CBRN PAPRs).
A.1.5.6

NFPA 1994, Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents, establishes two different classes of ensembles addressing the hazards present during chemical terrorism incidents. These ensembles consist of full body one- or multi-piece suits, gloves, and footwear.

Class 1 ensembles are designed with CBRN SCBA worn inside or outside of the ensemble, and are intended for wearer protection in an immediately dangerous to life and health (IDLH) environment. Ensembles are tested for their integrity to both gases and liquids. Materials are tested for permeation resistance to selected chemical agents and toxic industrial chemicals at concentrations consistent with the same levels used for evaluating CBRN APR; materials are also tested for virulence properties to demonstrate adequate physical hazard resistance and durability for a single use. Ensembles are tested for functionality in addition to NFPA 1994, CBRN protection for chemical terrorism incidents is addressed in optional performance criteria established by NFPA 1951, Standard on Protective Ensembles for Technical Rescue Incidents. The levels of protection established for the CBRN option are consistent with those provided for Class 1 in NFPA 1994 to CBRN terrorism incidents, however; ensembles are targeted against representative CBRN agents or simulants other than CBRN agents to help ensure that the protection will remain in place over the expected service life of the ensemble. Specifically, design and performance criteria are established in the standard to demonstrate limited protection against CBRN terrorism agents to permit the rescuer to escape and provide limited rescue while escaping the contaminated environment when encountering by low-concentration CBRN agents. These criteria are not intended to provide for rescue of first responders in the contaminated environment. The standard does not establish criteria for protection from all chemical warfare agents, protection from all biological agents, protection from all weapons of mass destruction, or protection from all toxic industrial chemicals.

Similarly, NFPA 1994, Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents, establishes requirements for a CBRN protective ensemble that can be used for protection during chemical terrorism incidents. The criteria and levels of protection established for the CBRN ensembles for chemical terrorism incidents are similar in indicating that the design and performance criteria established in this standard demonstrate limited protection against CBRN terrorism agents to permit rescuers to escape and provide limited rescue while escaping the contaminated environment when encountering by low-concentration CBRN agents. The criteria are not intended to provide for rescue of first responders in the contaminated environment. NFPA 1994 also does not establish criteria for protection from all chemical warfare agents, protection from all biological agents, protection from all weapons of mass destruction, or protection from all toxic industrial chemicals.

The Class 2 ensemble can be designed with the CBRN SCBA worn inside or outside of the ensemble and is intended for wearer protection in an immediately dangerous to life and health (IDLH) environment. Ensembles are tested for their integrity to both gases and liquids. Materials are tested for permeation resistance to selected chemical agents and toxic industrial chemicals at concentrations consistent with the same levels used for evaluating CBRN APR; materials are also tested for virulence properties to demonstrate adequate physical hazard resistance and durability for a single use. Ensembles are tested for functionality. In addition to NFPA 1994, CBRN protection for chemical terrorism incidents is addressed in optional performance criteria established by NFPA 1951, Standard on Protective Ensembles for Technical Rescue Incidents. The levels of protection established for the CBRN option are consistent with those provided for Class 2 in NFPA 1994 to CBRN terrorism incidents, however; ensembles are targeted against representative CBRN agents or simulants other than CBRN agents to help ensure that the protection will remain in place over the expected service life of the ensemble. Specifically, design and performance criteria are established in the standard to demonstrate limited protection against CBRN terrorism agents to permit the rescuer to escape and provide limited rescue while escaping the contaminated environment when encountering by low-concentration CBRN agents. These criteria are not intended to provide for rescue of first responders in the contaminated environment. The standard does not establish criteria for protection from all chemical warfare agents, protection from all biological agents, protection from all weapons of mass destruction, or protection from all toxic industrial chemicals.

The Class 3 ensemble is designed for protection against lower exposure levels of gases, vapors, liquids, and particulates compared to Class 2 ensembles and are intended for exposure levels below IDLH levels. Ensembles are evaluated for single- and liquid integrity, but with reduced integrity criteria compared to Class 2 ensembles. Materials are tested for permeation resistance to selected chemical agents and toxic industrial chemicals at the concentrations consistent with the same levels used for evaluating CBRN APR; materials are also tested for virulence properties to demonstrate adequate physical hazard resistance and durability for a single use. Ensembles are tested for functionality. In addition to NFPA 1994, CBRN protection for chemical terrorism incidents is addressed in optional performance criteria established by NFPA 1951, Standard on Protective Ensembles for Technical Rescue Incidents. The levels of protection established for the CBRN option are consistent with those provided for Class 3 in NFPA 1994 to CBRN terrorism incidents, however; ensembles are targeted against representative CBRN agents or simulants other than CBRN agents to help ensure that the protection will remain in place over the expected service life of the ensemble. Specifically, design and performance criteria are established in the standard to demonstrate limited protection against CBRN terrorism agents to permit the rescuer to escape and provide limited rescue while escaping the contaminated environment when encountering by low-concentration CBRN agents. These criteria are not intended to provide for rescue of first responders in the contaminated environment. The standard does not establish criteria for protection from all chemical warfare agents, protection from all biological agents, protection from all weapons of mass destruction, or protection from all toxic industrial chemicals.

The Class 4 ensemble is designed for protection against lower exposure levels of gases, vapors, liquids, and particulates compared to Class 2 ensembles and are intended for exposure levels below IDLH levels. Ensembles are evaluated for single- and liquid integrity, but with reduced integrity criteria compared to Class 2 ensembles. Materials are tested for permeation resistance to selected chemical agents and toxic industrial chemicals at the concentrations consistent with the same levels used for evaluating CBRN APR; materials are also tested for virulence properties to demonstrate adequate physical hazard resistance and durability for a single use. Ensembles are tested for functionality. In addition to NFPA 1994, CBRN protection for chemical terrorism incidents is addressed in optional performance criteria established by NFPA 1951, Standard on Protective Ensembles for Technical Rescue Incidents. The levels of protection established for the CBRN option are consistent with those provided for Class 4 in NFPA 1994 to CBRN terrorism incidents; however; ensembles are targeted against representative CBRN agents or simulants other than CBRN agents to help ensure that the protection will remain in place over the expected service life of the ensemble. Specifically, design and performance criteria are established in the standard to demonstrate limited protection against CBRN terrorism agents to permit the rescuer to escape and provide limited rescue while escaping the contaminated environment when encountering by low-concentration CBRN agents. These criteria are not intended to provide for rescue of first responders in the contaminated environment. The standard does not establish criteria for protection from all chemical warfare agents, protection from all biological agents, protection from all weapons of mass destruction, or protection from all toxic industrial chemicals.

The Correlating Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1994. The text of this paragraph is being moved to A.1.1.6.
Chemical terrorism agents include solid, liquid, and gaseous chemical warfare agents and toxic industrial chemicals. Chemical warfare agents include but are not limited to GB (t Sarin),GD (t Soman), VX, and specific toxic industrial chemicals. Many toxic industrial chemicals, for example chlorine and ammonia, are identified as potential chemical terrorism agents because of their potential availability and degree of injury they could potentially inflict.

The CBRN protection specified in this standard does not offer chemical terrorism agent protection and only offers limited protection for biological terrorism agents and radiological particulates terrorism agents.

Biological terrorism agents are bacteria, viruses, or the toxins derived from biological material. The CBRN ensemble protects from biological pathogens, for example pathogens present in a liquid or solid aerosolized state or as a liquid or solid aerosol. Airborne biological agents could be dispersed in the form of liquid aerosols or solid aerosols, for example a powder of bacterial spores, dispersed from a biological terrorism agent. Airborne liquid bacterial pathogens could be dispersed in the form of liquid aerosols. Airborne liquid pathogens could be potentially encountered during a terrorism incident as a result of deliberate dispersal or from body fluids released by victims of other weapons, that is, explosives or firearms.

CBRN ensembles protect from radiological particulates dispersed as aerosols. The protection is defined for blocking airborne particulates present as liquid or solid aerosols. Airborne particulates have the ability to emit alpha- and beta-particles and ionizing radiation from the decay of unstable isotopes.
**Emergency Medical Garment**

Emergency medical garments include, but are not limited to, full body clothing such as suits, coveralls, and patient/victim isolation bags, and non-full body clothing such as aprons, hoods, and sleeve protectors.

**Submitter Information Verification**

<table>
<thead>
<tr>
<th>Field</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitter Full Name</td>
<td>Dave Trebisacci</td>
</tr>
<tr>
<td>Organization</td>
<td>[Not Specified]</td>
</tr>
<tr>
<td>Street Address</td>
<td></td>
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<tr>
<td>City</td>
<td></td>
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<tr>
<td>State</td>
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<td>Zip</td>
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</tr>
<tr>
<td>Submittal Date</td>
<td>Tue Sep 01 21:36:53 EDT 2015</td>
</tr>
</tbody>
</table>

**Committee Statement**

The TC notes that hoods are a type of partial body garment that are not currently listed in the standard but can be considered a garment type for certification.

**Ballot Results**

- 15 Eligible Voters
- 2 Not Returned
- 13 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

- Not Returned
  - Davis, James E.
  - Laton, Michael A.

- Affirmative All
  - Allen, Jason L.
  - Corrado, Steven D.
  - Davis, Todd P.
  - Fithian, William A.
  - Harris, David R.
  - Heuvel, R. William E.
  - Hickerson, Barry L.
  - Lancaster, Beth C.
  - Laton, Michael A.
  - Marc, Philip C.
  - Patrick, Richard W.
  - Sadtler, Jeff

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
A.3.3.61 Multiple Use.

In this standard, garments, footwear, face protection devices, cleaning/utility gloves, and work gloves can be certified as multiple use items. The continued use of these items is subject to applying the care and use instructions provided by the manufacturer. While some multiple-use items are evaluated for performance after repeated laundering, these treatments do not indicate a specific wear life for the item. The authority having jurisdiction is responsible for determining when any particular item should be retired based on its condition and expected performance in protecting the first responder or first receiver.
A.4.6.1

ISO 27, Guidelines for corrective actions to be taken by a certification body in the event of misuse of its mark of conformity, is a component of accreditation of certification organizations specified in 4.1.3 and 4.2.3. These paragraphs contain mandatory reference to ISO 65, General requirements for bodies operating product certification systems, ISO 17065, Conformity assessment — Requirements for bodies certifying products, processes, and services, in which ISO 27 is referenced.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
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Submittal Date: Wed Sep 02 15:38:56 EDT 2015

Committee Statement

Committee Statement: The TC is updating this paragraph to include a new reference document.

Response Message:

Ballot Results

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

Not Returned

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Hanks, David R.
Hendrix, R. William E.
Hodel, Barry L.
Larson, Kent C.
Larsen, Karen E.
Marlin, Philip C.
Parker, Richard W.
Selbee, Jeff
The values contained in Table 6.2.3.6(a) through Table 6.2.3.6(e) are barehand dimensions, not glove pattern dimensions. Guidelines for applying these dimensions to flat glove patterns vary, depending on such factors as the type of pattern being used, the number of layers in the glove, and the type of fit desired for the glove.

The values contained in the five tables are those that apply to the five-size system intended to fit a population defined in the U.S. Army. These values are not valid if either a five-size system is being used or if the demographics of the intended population vary.

Caution should be used in determining the specific value to be used in glove patterning from the given range of values for each size of glove and glove size. The choice of the lowest, middle, or highest value is related to expectations of how the glove will fit.

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Zip: [Not Specified]
Submit Date: Wed Sep 02 10:06:35 EDT 2015

Committee Statement
Committee: [Not Specified]
Statement: [Not Specified]
Response: [Not Specified]
Message: [Not Specified]

Ballot Results
This item has passed ballot
15 Eligible Voters
2 Not Returned
13 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstentions
Not Returned
Davis, James E.
Laton, Michael A.
Affirmative All
Allen, Jason L.
Carroll, Steven G.
Darnall, Todd P.
D’Arienzo, William A.
Freeman, Patricia A.
Harris, David R.
Hosack, R. William E.
Hochberg, Barry L.
Lancaster, Beth C.
Laton, Michael A.
Merry, Philip C.
Patrick, Richard W.
Salter, Jeff
A.6.7.3

Protective ensembles offering CBRN protection are ensembles that are normally reusable, but offer CBRN protection when needed. These ensembles are not intended for reuse following exposure to CBRN terrorism agents, unless it can be demonstrated that the decontamination procedures adequately remove all contaminants. End users wishing to employ single-use ensembles should wear protective ensembles meeting the Class 4 requirements of NFPA 1994, Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents.

Submitter Information Verification

Submitter Full Name: Dave Trebisacci
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Street Address: 
City: 
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Submittal Date: Tue Sep 01 17:20:04 EDT 2015

Committee Statement

Committee Statement: The Correlating Committee has asked the Technical Committees with CBRN requirements to move those requirements to NFPA 1994. This item provides a means to move the requirements in NFPA 1999 to NFPA 1994 as a proposed Class 4. Proposed changes to NFPA 1999 remove all language in the scope, referenced test methods, definitions, design criteria, performance criteria, test methods, and appendix pertaining to CBRN protection requirements. A separate statement has been added to the Annex in A.1.1.4 to indicate that CBRN requirements are addressed in NFPA 1994.

Response Message: Public Input No. 34-NFPA 1999-2015 [Section No. A.6.6.3]

Ballot Results

This item has passed ballot

15 Eligible Votes
2 Not Returned
0 Affirmative with Comments
0 Negative with Comments
0 Abstain

Not Returned
Davis, James E.
Laton, Michael A.

Affirmative All
Allen, Jason L.
Corrado, Steven D.
Davis, Todd P.
Fithian, William A.
Freeman, Patricia A.
Harms, David K.
Hendry, W. Warren E.
Hendrix, Barry L.
Lancaster, Beth C.
Larkins, Kevin E.
Mead, Philip C.
Patrick, Ronald W.
Quattr, Jeff

Not Affirmative

B.1.2.3 ISO Publications.

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 65, General requirements for bodies operating product certification systems, 1996.

ISO 17065, Conformity assessment — Requirements for bodies certifying products, processes, and services, 2012.

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Zip: [Not Specified]
Submittal Date: Wed Sep 02 15:40:43 EDT 2015

Committee Statement

Committee Statement: The TC is no longer referencing Guide 65, so it is being deleted from Annex B.

Response Message:

B.1.2.3

ISO Publications.

Submitter Information Verification

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Committee Statement

Committee Statement: The TC is no longer referencing Guide 65, so it is being deleted from Annex B.

Response Message:

B.1.2.3

ISO Publications.

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Response Message:

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ISO Publications.

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B.1.2.3

ISO Publications.

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B.1.2.3

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B.1.2.3

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B.1.2.3

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Response Message:

B.1.2.3

ISO Publications.