MEMORANDUM

TO: Technical Committee on Hazardous Materials Protective Clothing and Equipment

FROM: Yvonne Smith, Project Administrator

DATE: September 28, 2016


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

30 Members Eligible to Vote
4 Members Not Returned (Buck, Greene, R., North, Thompson)

24 Members Voted Affirmative on All Revisions
4 Affirmative with Comment on one or more Revisions (Hirschey, Lovasic, Nystrom, Stull)
2 Members Voted Negative on one or more Revisions (Hirschey, Lovasic)
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 2/3 of ballots returned. See Sections 3.3.4.3.(c) and Second Draft 4.4.10.1 of the Regulations Governing the Development of NFPA Standards.
Global to all equations with "kN". The "k" is now deleted.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 16 11:17:08 EDT 2016

Committee Statement

Committee Statement: The TC has revised the equation. It was kilo Newtons in 2012 because the units were kN/meter rather than millimeter (a factor of 1000).

Response Message:

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.

Revise "bootie" to "sock" throughout document

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Fri Dec 11 23:08:22 EST 2015

Committee Statement

Committee Statement: The TC is revising terminology to reflect a more accurate term.
Response Message:

Public Comment No. 9-NFPA 1992-2015 [Section No. A.3.3.42]
Public Comment No. 10-NFPA 1992-2015 [Section No. 6.3.4]
Public Comment No. 14-NFPA 1992-2015 [Section No. 6.4.4.1]
Public Comment No. 16-NFPA 1992-2015 [Section No. 6.5.5.2]
Public Comment No. 17-NFPA 1992-2015 [Section No. 8.4.10.1]

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
7.1.9 Elastomeric Interface Gasket Requirements.

7.1.9.1 Elastomeric interface materials shall have an elongation at rupture of not less than 125% when tested according to the Section 8.22, Ultimate Tensile Strength Test.

7.1.9.2 Where the garment includes elastomeric interface gaskets materials, each elastomeric interface gasket material shall be tested for penetration resistance as specified in Section 8.4, Chemical Penetration Resistance Test, and shall exhibit no penetration for at least 1 hour for each of the specified chemicals and each additional chemical or specific chemical mixture for which the manufacturer is certifying the garment.

7.1.9.3 Where the garment includes elastomeric interface gaskets materials, each elastomeric interface gasket material shall be tested for cut resistance as specified in Section 8.11, Cut Resistance Test, and shall have a blade travel distance of not less than 20 mm (0.8 in.)

7.1.9.4 Where the garment includes elastomeric interface gaskets materials, each elastomeric interface gasket material shall be tested for puncture resistance as specified in Section 8.12, Puncture Resistance Test 1, and shall have a puncture resistance of not less than 9 N (3 lbf).

7.1.9.5 Where the garment includes elastomeric interface gaskets materials, each exposed elastomeric interface gasket material shall be tested for ultimate tensile strength as specified in Section 8.22, Ultimate Tensile Strength Test, and shall have an ultimate tensile strength of not less than 5 MPa (725 psi).

7.1.9.6 Where the garment includes elastomeric interface materials each elastomeric interface material shall be tested for cold weather performance as specified in Section 8.7, Cold Temperature Performance Test 1, and shall have a bending moments of not greater than 0.057 N m (0.50 in lbf) at an angular deflection of 60 degrees and -25°C (-13°F).

7.4.5 Elastomeric interface materials shall have an elongation at rupture of not less than 125% when tested according to the Section 8.22, Ultimate Tensile Strength Test, DELETE

7.4.6 Where the ensemble includes elastomeric interface gaskets materials, each elastomeric interface gasket material shall be tested for penetration resistance as specified in Section 8.4, Chemical Penetration Resistance Test, and shall exhibit no penetration for at least 1 hour for each of the specified chemicals and each additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble.

7.4.7 Where the ensemble includes elastomeric interface gaskets materials, each elastomeric interface gasket material shall be tested for cut resistance as specified in Section 8.11, Cut Resistance Test, and shall have a blade travel distance of not less than 20 mm (0.8 in.).

7.4.8 Where the ensemble includes elastomeric interface gaskets materials, each elastomeric interface gasket material shall be tested for puncture resistance as specified in Section 8.12, Puncture Resistance Test 1, and shall have a puncture resistance of not less than 9 N (3 lbf).

7.5.5 Where the ensemble includes elastomeric interface gaskets materials, each elastomeric interface gasket material shall be tested for penetration resistance as specified in Section 8.4, Chemical Penetration Resistance Test, and shall exhibit no penetration for at least 1 hour for each of the specified chemicals and...
each additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble.

7.5.6
Where the ensemble includes elastomeric interface gaskets materials, each elastomeric interface gasket material shall be tested for cut resistance as specified in Section 8.11, Cut Resistance Test, and shall have a blade travel distance of not less than 20 mm (0.8 in.).

7.5.7
Where the ensemble includes elastomeric interface gaskets materials, each elastomeric interface gasket material shall be tested for puncture resistance as specified in Section 8.12, Puncture Resistance Test 1, and shall have a puncture resistance of not less than 9 N (3 lbf).

7.5.8
Where the ensemble includes elastomeric interface gaskets materials, each elastomeric interface gasket material shall be tested for ultimate tensile strength as specified in Section 8.22, Ultimate Tensile Strength Test, and shall have an ultimate tensile strength of not less than 5 MPa (725 psi).

7.5.10
Where the ensemble includes elastomeric interface materials each elastomeric interface material shall be tested for cold weather performance as specified in Section 8.7, Cold Temperature Performance Test 1, and shall have a bending moments of not greater that 0.057 N m (0.50 in lbf) at an angular deflection of 60 degrees and -25°C (-13°F).

7.6.3
Garment materials and where applicable, visor, glove, footwear and elastomeric interface gasket materials shall be tested for heat transfer performance (HTP) as specified in Section 8.18, Heat Transfer Performance Test and shall have an average HTP rating of not less than 12 cal/cm².

7.6.5
Garment materials and where applicable, visor, glove, footwear and elastomeric interface gasket materials shall be tested for resistance to flame impingement as specified in Section 8.19, Flammability Resistance Test, and shall not burn a distance greater than 100 mm (4 in.), shall not sustain burning for more than 2 seconds, and shall not melt or drip.

7.7.2
Where the hood includes elastomeric interface gasket materials, the each elastomeric interface gasket material shall be tested for penetration resistance as specified in Section 8.4, Chemical Penetration Resistance Test, and shall exhibit no penetration for at least 1 hour for each of the specified chemicals and each additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble.

7.7.3
Where the hood includes an elastomeric interface gasket materials, the each elastomeric interface gasket material shall be tested for cut resistance as specified in Section 8.11, Cut Resistance Test, and shall have a blade travel distance of not less than 20 mm (0.8 in.).

7.7.4
Where the hood includes an elastomeric interface gasket materials, the each elastomeric interface gasket material shall be tested for puncture resistance as specified in Section 8.12, Puncture Resistance Test 1, and shall have a puncture resistance of not less than 9 N (3 lbf).

7.7.5
Where the hood includes an interface gasket, the interface gasket material shall be tested for ultimate tensile strength as specified in Section 8.22, Ultimate Tensile Strength Test, and shall have an ultimate tensile strength of not less than 5 MPa (725 psi).

8.4.1.1
This test method shall apply to garment materials, garment seams, visor materials, glove materials, footwear materials, garment closure assemblies, hood materials, and elastomeric interface gasket materials.

8.4.1.9
Modifications to this test method for testing elastomeric interface gasket materials shall be as specified in 8.4.14.
8.4.14 Specifc Requirements for Testing Elastomeric Interface Gasket Materials.

8.4.14.1 Specimens shall be taken from elastomeric interface gasket sheet material or formed elastomeric interfaces that are representative of the gasket material nominal thickness and composition.

8.7.1 Application
This test method shall apply to garment, hood, elastomeric interface and glove materials.

8.11.1.1 This test method shall apply to glove, footwear upper, and elastomeric interface gasket materials.

8.11.1.4 Modifications to this test method for evaluation of elastomeric interface gasket materials shall be as specified in 8.11.9.

8.11.2.1 Samples shall be whole gloves, footwear uppers, or interface gasket materials consisting of all layers.

8.11.9 Specific Requirements for Testing Elastomeric Interface Gasket Materials.

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

8.12.1.1 This test shall be applied to glove, footwear upper, and gasket elastomeric interface materials.

8.12.1.4 Modifications to this test method for evaluation of gasket elastomeric interface materials shall be as specified in 8.11.2.

8.12.9 Specific Requirements for Testing exposed Interface Gasket Materials.

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

8.18.1 This test method shall apply to protective garment materials, visor materials, glove materials, footwear upper materials, hood materials and elastomeric interface gasket materials, if applicable.

This test method shall apply to protective garment materials, visor materials, glove materials, footwear upper materials, and hood materials. Test methods shall also apply to elastomeric interface gasket materials in direct contact with the wearer’s skin and excludes interface materials where used between the hood and respirator.

8.19.1 This test method shall apply to garment materials, visor materials, glove materials, footwear upper materials, hood materials, and elastomeric interface gasket materials.

8.22.1 This method shall apply to elastomeric interface gasket materials.

8.22.2.1 Samples for conditioning shall be sufficiently sized pieces of elastomeric interface gasket sheet materials or individual formed interfaces.

8.22.5.3 The average elongation at rupture before and after heat aging shall be individually used to qualify the elastomeric character of the interface material.

8.22.6 Interpretation

8.22.6.1 The average tensile strength both before and after heat aging shall be individually used to determine...
8.22.6.2
An elongation at rupture of less than 125% shall result in an interface material being considered as a garment material.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sun Dec 13 08:28:03 EST 2015

Committee Statement

Committee Statement: As a result change to definition, a global revise regarding Elastomeric Interface will occur.
Response Message:
Public Comment No. 65-NFPA 1992-2015 [Section No. 8.11.1.1]
Public Comment No. 66-NFPA 1992-2015 [Section No. 8.11.1.4]
Public Comment No. 68-NFPA 1992-2015 [Section No. 8.11.9]
Public Comment No. 70-NFPA 1992-2015 [Section No. 8.12.9]
Public Comment No. 69-NFPA 1992-2015 [Section No. 8.12.1]
Public Comment No. 32-NFPA 1992-2015 [Section No. 7.5.5]
Public Comment No. 33-NFPA 1992-2015 [Section No. 7.5.6]
Public Comment No. 35-NFPA 1992-2015 [Section No. 7.5.8]
Public Comment No. 36-NFPA 1992-2015 [Section No. 7.7.2]
Public Comment No. 37-NFPA 1992-2015 [Section No. 7.7.3]
Public Comment No. 38-NFPA 1992-2015 [Section No. 7.7.4]
Public Comment No. 63-NFPA 1992-2015 [Section No. 8.4.1.1]
Public Comment No. 27-NFPA 1992-2015 [Section No. 7.1.9]
Public Comment No. 28-NFPA 1992-2015 [Section No. 7.4.5]
Public Comment No. 34-NFPA 1992-2015 [Section No. 7.5.7]
Public Comment No. 29-NFPA 1992-2015 [Section No. 7.4.6]
Public Comment No. 47-NFPA 1992-2015 [Section No. 8.4.1.9]
Public Comment No. 30-NFPA 1992-2015 [Section No. 7.4.7]
Public Comment No. 48-NFPA 1992-2015 [Section No. 8.4.14]
Public Comment No. 31-NFPA 1992-2015 [Section No. 7.4.8]

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
   1 Affirmative with Comments
   0 Negative with Comments
   0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill, William E.
Hirshey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Lovasic, Susan L.

8.12.9.1 States "Specimens shall be taken from interface gasket sheet material or formed interface gaskets that are representative of the gasket interface material nominal thickness." Missing text "and composition". Not just
thickness should be listed. See Section 8.4.14 for full and complete wording.
Revise: ISO 17011, General requirements for accreditation bodies accrediting conformity assessment bodies
to read ISO 17011, Conformity assessment - General requirements for accreditation bodies accrediting conformity assessment bodies.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Jun 20 10:18:34 EDT 2016

Committee Statement

Committee Statement: Revised title change.
Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nymström, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 59-NFPA 1992-2016 [ Global Comment ]

Revise 9N (3lbf) and should read 9N (2lbf).

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jun 21 13:43:26 EDT 2016

Committee Statement

Committee Statement: incorrect calculation.
Response Message:

Ballot Results

✔ This item has passed ballot

- 30 Eligible Voters
- 4 Not Returned
- 26 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Updating reference titles to be included in main document also:


ASTM F2413, Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear.


ISO Guide 27, Guidelines for corrective action to be taken by a certification body in the event of misuse of its mark of conformity.

ISO 9001, Quality Management Systems — Requirements.


ISO 11092, Textiles — Physiological effects — Measurement of thermal and water-vapor resistance under steady-state conditions (sweating guarded-hotplate test).

ISO 17011, Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies.

ISO/IEC 17065, Conformity assessment — requirements for bodies certifying products, processes, and services, 2012.


Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Jun 23 12:55:44 EDT 2016

Committee Statement

Committee Statement: Global - updating reference title to be included in main document
Response Message:

Ballot Results

✓ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirshey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Stull, Jeffrey O.
Should the edition of these standards also be specified. For example, ASTM F1359 should be 2016.
See attachment for revisions.

### Supplemental Information

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### Submitter Information Verification

**Submitter Full Name**: Thomas McGowan  
**Organization**: National Fire Protection Assoc  
**Street Address**:  
**City**:  
**State**:  
**Zip**:  
**Submittal Date**: Fri Dec 11 22:25:41 EST 2015

### Committee Statement

**Committee Statement**: Currently, NFPA 1992 does not address any specific requirements for external fittings are exhaust valves though they could be used in these ensembles.

### Ballot Results

- **This item has passed ballot**

  - 30 Eligible Voters
  - 4 NotReturned
  - 26 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 0 Abstention

- **Not Returned**
  - Buck, Ted S.
  - Greene, Russell R.
  - North, John W.
  - Thompson, Donald B.

- **Affirmative All**

See attachment.

Supplemental Information

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Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Fri Dec 11 22:33:53 EST 2015

Committee Statement

Committee Statement: There are existing provisions within the standard that prohibit the use of tape as a means for providing interfaces between elements of the ensemble, including the respirator facepiece for non-encapsulating ensembles, and other portions of the ensemble such as closures and areas of overlap. However, these provisions only appear as part of reference test methods and not part of the language with the body of the standard.

Response Message:


Ballot Results

☑️ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Lovasic, Susan L.

Section 6.4.6 is redundant to section 6.4.5.
1.1.3.1

Ensemble elements shall include garments, gloves, footwear, and hoods.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Dec 12 20:46:10 EST 2015

Committee Statement

Committee Statement: NFPA 1992 has specific requirements for four ensemble elements - footwear, gloves, hoods and garments. They need to be distinguished at the outset of the document.
Response Message:

Ballot Results

☑️ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
1.1.4*

This standard alone shall not specify requirements for protective ensembles or clothing for hazardous materials emergencies where the hazardous material is present as a gas or a vapor-producing liquid at vapor concentrations known to be toxic to the skin.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 19:58:29 EST 2015

Committee Statement

Committee Statement: Clarification that 1992 does not address the vapors present above toxic level from vapor-producing liquids. The liquid concentration of liquid from the vapor-producing liquid could be above toxic levels.

Response Message:

Public Comment No. 3-NFPA 1992-2015 [Section No. 1.1.4]

Ballot Results

✓ This item has passed ballot

- 30 Eligible Voters
- 4 Not Returned
- 26 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 0 Abstention

Not Returned

Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All

Allen, Jason L.
1.1.8*
This standard shall not specify requirements for the respiratory protection that is necessary for proper protection with the protective ensemble.

Supplemental Information

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Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 06 11:43:43 EDT 2016

Committee Statement

Committee Statement: The standard is silent on respiratory equipment though in some cases there is a need to specify the type of respirator worn with ensembles meeting this standard.

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
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1.3.2

This standard alone shall not specify requirements for protective ensembles or clothing for hazardous materials emergencies where the hazardous material is present as a gas or a vapor-producing liquid at vapor concentrations known to be toxic to the skin.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 19:59:43 EST 2015

Committee Statement

Committee Statement: Clarification that 1992 does not address the vapors present above toxic level from vapor-producing liquids. The liquid concentration of liquid from the vapor-producing liquid could be above toxic levels.

Response Message:

Public Comment No. 4-NFPA 1992-2015 [Section No. 1.3.2]

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 111-NFPA 1992-2016 [ Section No. 1.3.6 ]

1.3.6*
This standard shall not apply to the respiratory protection that is necessary for proper protection with the liquid splash--protective ensemble or protective clothing.

Supplemental Information

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Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jul 06 11:46:04 EDT 2016

Committee Statement

Committee Statement: The standard is silent on respiratory equipment though in some cases there is a need to specify the type of respirator worn with ensembles meeting this standard.

Response Message:

Ballot Results

☒ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
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Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
2.2 NFPA Publications.

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


Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jul 06 11:00:53 EDT 2016

Committee Statement

Committee Statement: updating reference sources and a reference has been added for NFPA 1986 for addressing an alternative form of respirator suitable for use with NFPA 1992 encapsulating ensembles.

Response Message:

Ballot Results

✓ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention
Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
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Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
2.3.2 AATCC Publications.

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


Submitter Information Verification

Submitter Full Name: Thomas McGowan  
Organization: National Fire Protection Assoc

Committee Statement

Committee Statement: Updating reference sources states and titles. 2004 is the date that describes the procedures agreed to by the TC. The revised 2012, 2014, and 2015 documents changed significantly and the TC is not prepared to adopt those changes.

Ballot Results

- This item has passed ballot

- 30 Eligible Voters
- 4 Not Returned
- 26 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All

Allen, Jason L.
Clifford, Brian J.
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Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
2.3.3 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.


Submitter Information Verification

Submitter Full Name: Thomas McGowan
Committee Statement

Committee Statement: Reference source update.
Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

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Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
2.3.5 ISO Publications.

International Organization for Standardization, 1 rue de Varembé, Case postale 56, CH-1211 Geneva 20, ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland.

ISO Guide 27, Guidelines for corrective action to be taken by a certification body in the event of misuse of its mark of conformity, 1983.

ISO 4649, Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device, 2010.


ISO 17021, Conformity assessment — Requirements for bodies providing audit and certification of management systems, 2011.

ISO/IEC 17025, General requirements for the competence of testing and calibration laboratories, 2005.

ISO/IEC 17065, Conformity assessment — Requirements for bodies certifying products, processes, and services, 2012.
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<td>Ziskin, Michael</td>
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Second Revision No. 49-NFPA 1992-2016 [Section No. 2.3.7]

2.3.6 U.S. Government Publications.

Submitter Information Verification
Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City:
State:
Zip:
Submittal Date: Mon Jun 20 10:07:08 EDT 2016

Committee Statement
Committee Statement: updating source references.
Response Message:

Ballot Results
This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
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Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
**Sock.**

An extension of the garment or suit leg or a separate item that covers the entire foot and is intended to be worn inside a protective outer boot.

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### Supplemental Information

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### Submitter Information Verification

- **Submitter Full Name:** Thomas McGowan
- **Organization:** National Fire Protection Assoc
- **Street Address:**
- **City:**
- **State:**
- **Zip:**
- **Submittal Date:** Fri Dec 11 20:02:35 EST 2015

---

### Committee Statement

**Committee Statement:** The definition of the term "bootie" in this standard deals with foot protection worn inside a boot. A large number of users, sales people and consultants do not interpret this term in this way and may assume that a bootie can be worn as outer footwear. The term "sock" is clearly understood by a great majority of potential users, sales people and consultants as intended to be worn inside outer footwear. The term "bootie" in this standard should be replaced by the term "sock" or "protective sock" to mitigate this potential misunderstanding.

The committee response to FR24 infers that the committee accepted this justification during public input.

**Response Message:**

- Public Comment No. 8-NFPA 1992-2015 [New Section after 3.3]
- Public Comment No. 5-NFPA 1992-2015 [Section No. 3.3.4]

---

### Ballot Results

- ✔️ This item has passed ballot

- 30 Eligible Voters
- 4 Not Returned
- 26 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention
Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
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Affirmative All
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Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 4-NFPA 1992-2015 [Section No. 3.3.21]

3.3.22 Ensemble Elements.

The compliant products that provide protection to the upper and lower torso, arms, legs, head, hands, and feet. Multiple elements, including garments, gloves, footwear, and hoods.

3.3.22.1 CBRN Terrorism Incident Protective Footwear.

The element of the protective ensemble that provides protection to the foot, ankle, and lower leg.

3.3.22.2 CBRN Terrorism Incident Protective Footwear Cover.

The item of the protective ensemble to be worn over standard footwear to provide barrier and physical protection to the wearer's feet.

3.3.22.3 CBRN Terrorism Incident Protective Garment(s).

The element of the protective ensemble that provides protection to the upper and lower torso, head, arms, and legs; excluding the hands and feet.

3.3.22.4 CBRN Terrorism Incident Protective Glove(s).

The element of the protective ensemble that provides protection to the wearer's hands and wrists.

3.3.22.5 CBRN Terrorism Incident Protective Hood.

The element of the protective ensemble that provides protection to the wearer's head and neck.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Fri Dec 11 20:11:42 EST 2015

Committee Statement

Committee Statement: NFPA 1992 has specific requirements for 4 ensemble elements - footwear, gloves, hoods, and garments.

Response Message:

Public Comment No. 39-NFPA 1992-2015 [Section No. A.3.3.21]
Public Comment No. 6-NFPA 1992-2015 [Section No. 3.3.21]

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
24 Affirmative All
2 Affirmative with Comments
0 Negative with Comments
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<td>Greene, Russell R.</td>
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<td>North, John W.</td>
<td>Thompson, Donald B.</td>
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<th>Affirmative All</th>
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<td>Allen, Jason L.</td>
<td>Clifford, Brian J.</td>
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<tr>
<td>Corrado, Steven D.</td>
<td>Daly, Jr., Richard P.</td>
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<td>Del Re, Nicholas</td>
<td>Fithian, William A.</td>
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<td>Harkness, A. Ira</td>
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<td>West, Robert</td>
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<td>Zeigler, James P.</td>
<td>Ziskin, Michael</td>
</tr>
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<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Lovasic, Susan L.</td>
<td>The phrase &quot;CBRN Terrorism Incident&quot; precedes terms in 3.3.22.1 thru 3.3.22.5. This is not appropriate for NFPA 1992. It is likely meant for NFPA 1994. Suggest &quot;CBRN Terrorism Incident&quot; be removed from 3.3.22.1 thru 3.3.22.5.</td>
</tr>
<tr>
<td>Stull, Jeffrey O.</td>
<td>The individual elements should probably read &quot;Hazmat and CBRN...&quot; given the title change for the standard</td>
</tr>
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</table>
Second Revision No. 5-NFPA 1992-2015 [Section No. 3.3.36]

3.3.16 Elastomer
A polymeric material that returns to its original length and shape after stretching.

3.3.17* Elastomeric Interface Material.
An exposed elastomeric material that is not otherwise used as a garment material, which provides an interface between components of the ensemble or ensemble elements, other than seams, and if applicable, the interface between the respirator facepiece and the ensemble or ensemble elements.

Supplemental Information

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Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 20:28:38 EST 2015

Committee Statement

Committee Statement:
1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface.

2. Interface materials do not have to be made from elastomers

3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex.

4. The standard should address exposed interface materials.

5. Seam tape is an interface material already addressed in the standard.

Therefore it was necessary to add definition of elastomer and revise interface definition.

Response Message:
Public Comment No. 24-NFPA 1992-2015 [Section No. 3.3.36]
Public Comment No. 25-NFPA 1992-2015 [Section No. A.3.3.36]

Ballot Results
This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasici, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
3.3.41* Liquid Splash–Protective Ensemble.

Multiple elements of compliant protective clothing and equipment products that when worn together provide protection from some risks, but not all risks, of hazardous materials emergency incident operations involving liquids to the torso, legs, arms, head, hands, and feet.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc

Committee Statement

Committee Statement: Completes the definition of ensemble taking coverage description formerly in definition for ensemble elements.

Response Message:

Public Comment No. 7-NFPA 1992-2015 [Section No. 3.3.41]

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
All elements of the protective ensemble and ensemble elements that are labeled as being compliant with this standard shall undergo recertification on an annual basis. This recertification shall include inspection and evaluation to all design requirements and testing to all performance requirements as required by this standard on all manufacturer models and components as specified in 4.4.3.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 23:32:48 EST 2015

Committee Statement

Committee Statement: Ensembles and all elements should be recertified annually regardless of whether that are part of an ensemble or clothing.
Response Message:

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Liquid splash–protective garments, gloves, footwear, ensembles, and ensemble elements, and ensemble components shall be inspected, evaluated, and tested for annual recertification.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 23:35:22 EST 2015

Committee Statement

Committee Statement: Need to add hood to this paragraph. Simplified language to include hoods by reference as an ensemble element.

Response Message:

Public Comment No. 42-NFPA 1992-2015 [Section No. 4.4.3 [Excluding any Sub-Sections]]

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
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Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Each liquid splash-protective garment, glove, footwear, ensemble and ensemble element shall be inspected and evaluated to each of the design requirements specified in Chapter 6.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 23:36:35 EST 2015

Committee Statement

Committee Statement: Needed to add hoods to this paragraph. Simplified language by including hoods by reference under ensemble elements.

Response Message:

Public Comment No. 43-NFPA 1992-2015 [Section No. 4.4.3.1]

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
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North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
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| Mann, Philip C. |
| Nystrom, Ulf |
| Rogers, Paul G. |
| Shelton, Robert E. |
| Stull, Jeffrey O. |
| West, Robert |
| Wisner, Jr., John E. |
| Zeigler, James P. |
| Ziskin, Michael |
Second Revision No. 38-NFPA 1992-2015 [Section No. 4.4.3.3]

4.4.3.3*

All garment material, visor, glove, footwear, hoods, and optional chemical flash fire protection performance requirements shall be evaluated as specified in Chapter 7, with the following modifications:

(1) Chemical penetration resistance testing shall be limited to the testing specified in 7.1.3, 7.1.7.1, 7.2.2, 7.1.2, 7.1.6.1, 7.1.7.1, 7.1.8.1, 7.1.9.2, 7.2.2, 7.2.7, 7.3.2, and 7.3.8, and shall be performed against the following chemicals:

(a) Acetone Fuel H — surrogate gasoline [42.5 percent toluene, 42.5 percent isooctane, and 15 percent denatured ethanol, volume/volume (v/v)] as defined in ASTM D471, Standard Test Method for Rubber Property-Effect of Liquids.

(b) 93.1 percent w/w sulfuric acid Methyl isobutyl ketone, CAS No. 108-10-1, >95 percent weight/weight (w/w)

(c) Sulfuric acid, CAS No. 7664-93-9, 93.1 percent, w/w

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

Supplemental Information

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

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Sat Dec 12 21:18:05 EST 2015

Committee Statement

Committee Statement: Replace acetone with new ketone used on penetration testing. Add hoods to the lists of elements. Additional revision to include Fuel H.

Response Message:  

Public Comment No. 41-NFPA 1992-2015 [Section No. 4.4.3.3]

Ballot Results

✓ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
4.5.3*

The manufacturer shall be registered to ISO 9001, Quality management systems — requirements Management Systems — Requirements.

4.5.3.1

Registration to the requirements of ISO 9001, Quality management systems — requirements Management Systems — Requirements, shall be conducted by a registrar that is accredited for personal protective equipment in accordance with ISO 17021, Conformity assessment — Requirements for bodies providing audit and certification of management systems.

4.5.3.2

The scope of the ISO registration shall include at least the design and manufacturing systems management for the personal protective equipment being certified.

4.5.3.3

The registrar shall affix the accreditation mark on the ISO registration certificate.
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 52-NFPA 1992-2016 [Sections 5.1.1.8, 5.1.1.9]

5.1.1.8
The certification organization’s label, symbol, or identifying mark shall be legibly printed on the product label. All letters shall be at least $2.5\text{ mm}$ ($\frac{1}{4}\text{ in.}$) high.

5.1.1.9
The compliance statements and information specified in 5.1.2 through 5.1.6, as applicable for the specific protective ensemble, element, or protective clothing item, shall be legibly printed on the product label. All letters shall be at least $3.25\text{ mm}$ ($\frac{5}{32}\text{ in.}$) high.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 20 10:36:13 EDT 2016

Committee Statement

Committee Statement: The labeling lettering height should be consistent between standards. These modifications will align the standards with the same lettering heights.
Response Message:

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen, Jason L.</td>
</tr>
<tr>
<td>Clifford, Brian J.</td>
</tr>
<tr>
<td>Corrado, Steven D.</td>
</tr>
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<td>Daly, Jr., Richard P.</td>
</tr>
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<td>Del Re, Nicholas</td>
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<td>Fithian, William A.</td>
</tr>
<tr>
<td>Green, Dustin</td>
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<td>Haines, Todd W.</td>
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<td>Haskell, III, William E.</td>
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<td>Hirschey, Ryan C.</td>
</tr>
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<td>Kerbow, Kyle</td>
</tr>
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<td>Kienzle, Michael P.</td>
</tr>
<tr>
<td>Kirsteins, Andra</td>
</tr>
<tr>
<td>Lancaster, Beth C.</td>
</tr>
<tr>
<td>Lehtonen, Karen E.</td>
</tr>
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<td>Lovasic, Susan L.</td>
</tr>
<tr>
<td>Mann, Philip C.</td>
</tr>
<tr>
<td>Nystrom, Ulf</td>
</tr>
<tr>
<td>Rogers, Paul G.</td>
</tr>
<tr>
<td>Shelton, Robert E.</td>
</tr>
<tr>
<td>Stull, Jeffrey O.</td>
</tr>
<tr>
<td>West, Robert</td>
</tr>
<tr>
<td>Wisner, Jr., John E.</td>
</tr>
<tr>
<td>Zeigler, James P.</td>
</tr>
<tr>
<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>
Second Revision No. 39-NFPA 1992-2015 [Section No. 5.1.1.10]

5.1.1.10

In addition to the compliance statements specified in 5.1.1.9, at least the following information shall also be printed legibly on the product label(s), and all letters shall be at least \(2\frac{1}{16}\) mm (\(\frac{1}{8}\) in.) high:

1. Manufacturer’s name, identification, or designation
2. Manufacturer’s address
3. Country of manufacture
4. Model, style, or serial number
5. Size
6. Garment, glove, footwear, ensemble material(s), as applicable
7. Visor material(s) if provided
8. Glove component for ensemble
9. Footwear component for ensemble

Total heat loss (THL), evaporative resistance (Ret), and insulation value (Rct) as required by 6.1.5

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Dec 12 21:45:09 EST 2015

Committee Statement

Committee Statement:

It is proposed that this information be provided in the manufacturer’s Technical Data Package along with other data demonstrating the compliance of the product to the standard. Instead of the THL value, recommendation is made that the words “Breathable (see manufacturer’s Technical Data Package)” be placed on the label. This approach for formatting this information provides a more suitable format for indicating breathable of the garment.

The labeling lettering height should be consistent between standards. These modifications will align the standards with the same lettering heights.

Response Message:

Public Comment No. 53-NFPA 1992-2015 [Section No. 5.1.1.10]

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26  Affirmative All
   0  Affirmative with Comments
   0  Negative with Comments
   0  Abstention

**Not Returned**
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

**Affirmative All**
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
5.1.1.11
Where detachable components, including, but not limited to, outer garments, outer gloves, or outer boots, must be worn with a liquid splash–protective ensemble or protective clothing item in order for the ensemble or clothing item to be compliant with this standard, at least the following statement and information shall also be printed legibly on the product label. All letters shall be at least 2.5 mm (\( \frac{1}{16} \) in.) high. The appropriate term — garment, glove, footwear, or ensemble — shall be inserted where indicated in the label text. The detachable component(s) shall be listed following this statement by type, identification, and how properly worn:

“FOR COMPLIANCE WITH NFPA 1992, THE FOLLOWING ADDITIONAL COMPONENTS MUST BE WORN IN CONJUNCTION WITH THIS LIQUID SPLASH–PROTECTIVE [insert the term GARMENT, GLOVE, FOOTWEAR, or ENSEMBLE here]:

[List detachable components here.]”

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: City: State: Zip:
Submittal Date: Mon Jun 20 10:39:25 EDT 2016

Committee Statement
Committee Statement: The labeling lettering height should be consistent between standards. These modifications will align the standards with the same lettering heights.
Response Message:

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

**Affirmative All**
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
5.1.2.1 Each liquid splash-protective garment shall have at least the following compliance statements and information on the product label:


<table>
<thead>
<tr>
<th>ADDITIONAL REQUIREMENTS</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited chemical flash fire protection for escape only in the event of a chemical flash fire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Claim of optional breathability for garment materials</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The technical data package contains information on chemicals and specific chemical mixtures for which this garment is certified. Consult the technical data package and manufacturer’s instructions before use. Do not remove this label.”

Supplemental Information

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label_Table.docx</td>
<td></td>
</tr>
</tbody>
</table>

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 20:54:30 EST 2015

Committee Statement

Committee Statement: Correct date and additional requirement in chart.
Response Message:
Public Comment No. 18-NFPA 1992-2015 [Section No. 5.1.2.1]

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
  1 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, Ill, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Lovasic, Susan L.

There is an extra space between 201_8 that should be removed.
Second Revision No. 8-NFPA 1992-2015 [New Section after 5.1.2.2]

5.1.2.3

For garments where the integrity of the interfaces between the respirator and hood or suit, between gloves and garment sleeves, and between the footwear and garment legs has not been evaluated as specified in 7.4.1 or 7.5.1, the following warning shall be provided as part of the product label:

“WARNING

THE INTEGRITY OF THE FOLLOWING INTERFACES OF THIS GARMENT WITH THE RESPIRATOR, GLOVES, AND FOOTWEAR HAS NOT BEEN EVALUATED ACCORDING TO THE REQUIREMENTS OF NFPA 1992. USE OF THIS GARMENT IN A LIQUID EXPOSURE ENVIRONMENT MAY RESULT IN LIQUID PENETRATION THROUGH THESE INTERFACES.”

5.1.2.4

Where the garment is represented as providing the optional breathability above the basic requirements of this standard, the YES box shall be marked. Where the garment ensemble is not represented as providing the optional breathability above the basic requirements of this standard, the NO box shall be marked.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organizations: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 20:56:26 EST 2015

Committee Statement

Committee Statement: NFPA 1992 permits the certification of individual elements that include garments; however, the overall liquid splash protection provided to the individual wearer is dependent on the integration of garments with a respirator, gloves, and footwear. Since there is no requirement to evaluate the overall liquid penetration resistance of garments with these items, and users need to be aware that the interfaces have not been evaluated.

Response Message:

Public Comment No. 67-NFPA 1992-2015 [New Section after 5.1.2.2]

Ballot Results

- This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Hirschey, Ryan C.

Generally agree with the inclusion of reporting optional "breathability" claims, however, the language in section 5.1.2.4 is a bit confusing and misleading when you consider a baseline level of performance is not established in the standard. This section should be modified to better reflect its intent.
Second Revision No. 9-NFPA 1992-2015 [Section No. 5.1.3.1]

5.1.3.1
Each liquid splash-protective glove shall have at least the following compliance statements and information on the product label:


<table>
<thead>
<tr>
<th>ADDITIONAL REQUIREMENT</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIMITED CHEMICAL FLASH FIRE PROTECTION FOR ESCAPE ONLY IN THE EVENT OF A CHEMICAL FLASH FIRE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

THE TECHNICAL DATA PACKAGE CONTAINS INFORMATION ON CHEMICALS AND SPECIFIC CHEMICAL MIXTURES FOR WHICH THIS GLOVE IS CERTIFIED. CONSULT THE TECHNICAL DATA PACKAGE AND MANUFACTURER'S INSTRUCTIONS BEFORE USE.

DO NOT REMOVE THIS LABEL.”

Submitter Information Verification

Submitter Full Name: Thomas McGowan  
Organization: National Fire Protection Assoc  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Fri Dec 11 21:00:15 EST 2015

Committee Statement

Committee Statement: Correct date  
Response Message:  
Public Comment No. 19-NFPA 1992-2015 [Section No. 5.1.3.1]

Ballot Results

✔ This item has passed ballot

30 Eligible Voters  
4 Not Returned  
25 Affirmative All  
1 Affirmative with Comments  
0 Negative with Comments  
0 Abstention
Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Lovasic, Susan L.

There is inconsistency in the use of italics for some words in the optional flash fire escape label wording. This occurs in 5.1.3.1, 5.1.4.1, 5.1.5.1, 5.1.6.1, and 5.1.7.1. Decide on a consistent way and apply to all 5 of these label sections.
Second Revision No. 117-NFPA 1992-2016 [Sections 5.1.3.3.1, 5.1.3.3.2]

5.1.3.3.1 Where the glove is not compliant with the optional limited chemical flash fire protection above the basic requirements of this standard, the following statement shall be used:


5.1.3.3.2 Where the glove is compliant with the optional limited chemical flash fire protection above the basic requirements of this standard, the following statement shall be used:


Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Fri Aug 05 15:56:56 EDT 2016

Committee Statement

Committee Statement: correct date
Response Message:

Public Comment No. 20-NFPA 1992-2015 [Section No. 5.1.3.3.2]

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Each liquid splash–protective footwear piece shall have at least the following compliance statements and information on the product label:


<table>
<thead>
<tr>
<th>ADDITIONAL REQUIREMENT</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited chemical flash fire protection for escape only in the event of a chemical flash fire</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The technical data package contains information on chemicals and specific chemical mixtures for which this footwear is certified. Consult technical data package and manufacturer’s instructions before use. Do not remove this label.”

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 21:02:58 EST 2015

Committee Statement

Committee Statement: Correct Date
Response Message:

Public Comment No. 21-NFPA 1992-2015 [Section No. 5.1.4.1]

Ballot Results

» This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention
Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
5.1.5.1
Each nonencapsulating liquid splash–protective ensemble shall have at least the following compliance statements and information on the product label:


<table>
<thead>
<tr>
<th>ADDITIONAL REQUIREMENTS</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIMITED CHEMICAL FLASH FIRE PROTECTION FOR ESCAPE ONLY IN THE EVENT OF A CHEMICAL FLASH FIRE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLAIM OF OPTIONAL BREATHABILITY FOR GARMENT MATERIALS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

THE TECHNICAL DATA PACKAGE CONTAINS INFORMATION ON CHEMICALS AND SPECIFIC CHEMICAL MIXTURES FOR WHICH THIS NONENCAPSULATING ENSEMBLE IS CERTIFIED. CONSULT THE TECHNICAL DATA PACKAGE AND MANUFACTURER’S INSTRUCTIONS BEFORE USE. DO NOT REMOVE THIS LABEL.”

Supplemental Information

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label_Table.docx</td>
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</tr>
</tbody>
</table>

Submitter Information Verification

<table>
<thead>
<tr>
<th>Submitter Full Name:</th>
<th>Thomas McGowan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization:</td>
<td>National Fire Protection Assoc</td>
</tr>
<tr>
<td>Street Address:</td>
<td></td>
</tr>
<tr>
<td>City:</td>
<td></td>
</tr>
<tr>
<td>State:</td>
<td></td>
</tr>
<tr>
<td>Zip:</td>
<td></td>
</tr>
<tr>
<td>Submittal Date:</td>
<td>Fri Dec 11 21:03:39 EST 2015</td>
</tr>
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</table>

Committee Statement

Committee Statement: Correct date and additional table for breathability.
Response Message:

Public Comment No. 22-NFPA 1992-2015 [Section No. 5.1.5.1]

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
   1 Affirmative with Comments
   0 Negative with Comments
   0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Lovasic, Susan L.

For consistency, add "bold" to the text for the labeling of "claims of optional breathability..." specified in sections
5.1.5.1, 5.1.6.1, and 5.1.7.1.
Second Revision No. 15-NFPA 1992-2015 [New Section after 5.1.5.2]

5.1.5.3 Where the manufacturer specifies outer boot footwear element options as permitted in 6.4.4.2, the following additional language shall be provided as part of the product label:


5.1.5.4 Where the garment is represented as providing the optional breathability above the basic requirements of this standard, the YES box shall be marked. Where the garment ensemble is not represented as providing the optional breathability above the basic requirements of this standard, the NO box shall be marked.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 21:06:54 EST 2015

Committee Statement

Committee Statement: A larger number of footwear options should be afforded to first responders when the ensemble includes booties that already meet the liquid chemical penetration resistance requirements of the standard as well as other properties established for garment materials. The proposed permissive language requires that ensembles that use this particular option include additional labeling is part of the product label to guide end users in using the appropriate footwear.

Response Message:

Public Comment No. 62-NFPA 1992-2015 [New Section after 5.1.5.2]

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Hirschey, Ryan C.
Generally agree with the inclusion of reporting optional "breathability" claims, however, the language in section 5.1.5.4 is a bit confusing and misleading when you consider a baseline level of performance is not established in the standard. This section should be modified to better reflect its intent.
5.1.6.1
Each encapsulating liquid splash–protective ensemble shall have at least the following compliance statements and information on the product label:


<table>
<thead>
<tr>
<th>ADDITIONAL REQUIREMENTS</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIMITED CHEMICAL FLASH FIRE PROTECTION FOR ESCAPE ONLY IN THE EVENT OF A CHEMICAL FLASH FIRE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLAIM OF OPTIONAL BREATHABILITY FOR GARMENT MATERIALS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

THE TECHNICAL DATA PACKAGE CONTAINS INFORMATION ON CHEMICALS AND SPECIFIC CHEMICAL MIXTURES FOR WHICH THIS ENCAPSULATING ENSEMBLE IS CERTIFIED. CONSULT THE TECHNICAL DATA PACKAGE AND MANUFACTURER'S INSTRUCTIONS BEFORE USE.
DO NOT REMOVE THIS LABEL.”

Supplemental Information

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label_Table.docx</td>
<td></td>
</tr>
</tbody>
</table>

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Fri Dec 11 21:04:26 EST 2015

Committee Statement

Committee Statement: Correct date and additional information to table
Response Message:
Public Comment No. 23-NFPA 1992-2015 [Section No. 5.1.6.1]

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
  0 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
5.1.6.3 Where the manufacturer specifies outer boot footwear element options as permitted in 6.5.5.2, the following additional language shall be provided as part of the product label:


5.1.6.4 Where the garment is represented as providing the optional breathability above the basic requirements of this standard, the YES box shall be marked. Where the garment ensemble is not represented as providing the optional breathability above the basic requirements of this standard, the NO box shall be marked.

Committee Statement

A larger number of footwear options should be afforded to first responders when the ensemble includes booties that already meet the liquid chemical penetration resistance requirements of the standard as well as other properties established for garment materials. The proposed permissive language requires that ensembles that use this particular option include additional labeling is part of the product label to guide end users in using the appropriate footwear.

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
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Green, Dustin
Haines, Todd W.
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Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Hirschey, Ryan C.

Generally agree with the inclusion of reporting optional "breathability" claims, however, the language in section 5.1.6.4 is a bit confusing and misleading when you consider a baseline level of performance is not established in the standard. This section should be modified to better reflect its intent.
5.1.7.1

Each liquid splash–protective hood shall have at least the following compliance statements and information on the product label:


<table>
<thead>
<tr>
<th>ADDITIONAL REQUIREMENTS</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIMITED CHEMICAL FLASH FIRE PROTECTION FOR ESCAPE ONLY IN THE EVENT OF A CHEMICAL FLASH FIRE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLAIM OF OPTIONAL BREATHABILITY FOR GARMENT MATERIALS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

THE TECHNICAL DATA PACKAGE CONTAINS INFORMATION ON CHEMICALS AND SPECIFIC CHEMICAL MIXTURES FOR WHICH THIS HOOD IS CERTIFIED. CONSULT THE TECHNICAL DATA PACKAGE AND MANUFACTURER’S INSTRUCTIONS BEFORE USE. DO NOT REMOVE THIS LABEL.”

5.1.7.2

Where the garment is represented as providing the optional breathability above the basic requirements of this standard, the YES box shall be marked. Where the garment ensemble is not represented as providing the optional breathability above the basic requirements of this standard, the NO box shall be marked.

Supplemental Information

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label_Table.docx</td>
<td></td>
</tr>
</tbody>
</table>

Submitter Information Verification

<table>
<thead>
<tr>
<th>Submitter Full Name: Thomas McGowan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization: National Fire Protection Assoc</td>
</tr>
<tr>
<td>Street Address:</td>
</tr>
<tr>
<td>City:</td>
</tr>
<tr>
<td>State:</td>
</tr>
<tr>
<td>Zip:</td>
</tr>
<tr>
<td>Submittal Date: Thu Jun 23 14:23:55 EDT 2016</td>
</tr>
</tbody>
</table>

Committee Statement

<table>
<thead>
<tr>
<th>Committee Statement: additional table information.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Message:</td>
</tr>
</tbody>
</table>

Ballot Results

✔ This item has passed ballot
30 Eligible Voters
4 Not Returned
25 Affirmative All
  1 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
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Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment

National Fire Protection Association Report http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
Hirschey, Ryan C.

Generally agree with the inclusion of reporting optional "breathability" claims, however, the language in section 5.1.7.2 is a bit confusing and misleading when you consider a baseline level of performance is not established in the standard. This section should be modified to better reflect its intent.
The technical data package shall contain all documentation required by this standard and the values obtained from the initial certification showing compliance with the requirements of Chapter 7 in the current edition of this standard, using the reporting formats provided in [Table 5.3.2(a)] and [Table 5.3.2(b)] for each ensemble, element, material, or component, as applicable.

Table 5.3.2(a) Format for Reporting Certification Test Data in Technical Data Package

<table>
<thead>
<tr>
<th>Ensemble or Element</th>
<th>Performance Requirement</th>
<th>Test Method</th>
<th>Requirement</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Requirements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonencapsulating Ensemble or Encapsulating Ensemble</td>
<td>Liquidtight integrity</td>
<td>ASTM F1359/F1359M with modifications (Section 8.2)</td>
<td>No liquid penetration</td>
<td></td>
</tr>
</tbody>
</table>
| Garment (or hood) | Overall garment function and integrity | ASTM F1154 (Section 8.3) | Complete all tasks within 15 minutes | No liquid penetration
Accommodates head protection devices meeting ANSI/ISEA Z89.1 (Type 1, Class G)
Test subject has visual acuity of 20/35 or better through visor and facepiece lens
Protective flap remains closed over closure system
Test subject properly identifies 3 out of 4 numbers on NFPA 704 placard at each angle |
<p>| Garment (or hood) material | Chemical penetration resistance | ASTM F903 (Section 8.4) | No penetration for at least 1 hour for each of the specified chemicals | See separate table |
|                       | Burst strength | ASTM D751 (Section 8.8) | Strength ≥ 135 N |                                                                        |
|                       | Puncture propagation tear resistance | ASTM D2582 (Section 8.6) | Tear resistance ≥ 25 N |                                                                        |
|                       | Cold temperature performance | ASTM D747 (Section 8.7) | Bending moment ≤ 0.057 N·m |                                                                        |
| Garment (or hood) visor | Chemical penetration resistance | ASTM F903 (Section 8.4) | No penetration for at least 1 hour for each of the specified chemicals | See separate table |
|                       | Visor high-mass impact resistance | ANSI Z87.1, Section 9.11 (Section 8.9) | No full-thickness cracks, holes, or fractures |                                                                        |
| Garment (or hood) seam | Chemical penetration resistance test | ASTM F903 (Section 8.4) | No penetration for at least 1 hour for each of the specified chemicals | See separate table |
|                       | Seam breaking strength | ASTM D751 (Section 8.8) | Strength ≥ 33 kN/25 mm |                                                                        |
| Garment (or hood) closure | Chemical penetration resistance | ASTM F903 (Section 8.4) | No penetration for at least 1 hour for each of the specified chemicals | See separate table |
|                       | Closure breaking strength | ASTM D751 (Section 8.8) | Strength ≥ 33 kN/25 mm |                                                                        |</p>
<table>
<thead>
<tr>
<th>Ensemble or Element</th>
<th>Performance Requirement</th>
<th>Test Method</th>
<th>Requirement</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface material</td>
<td>Chemical penetration resistance</td>
<td>ASTM F903 (Section 8.4)</td>
<td>No penetration for at least 1 hour for each of the specified chemicals</td>
<td>See separate table</td>
</tr>
<tr>
<td></td>
<td>Cut resistance</td>
<td>ASTM F1790/F1790M (Section 8.11)</td>
<td>Blade travel distance ≥ 20 mm at 50 g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Puncture resistance</td>
<td>ASTM F1342/F1342M, Method A (Section 8.12)</td>
<td>Puncture force ≥ 7 N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ultimate tensile strength</td>
<td>ASTM D412 (Section 8.22)</td>
<td>Strength ≥ 4 MPa</td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td>Liquidtight integrity</td>
<td>ASTM D5151 with modifications (Section 8.10)</td>
<td>No leakage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gloved hand dexterity</td>
<td>ASTM F2010/F2010M (Section 8.13)</td>
<td>Percent increase over barehanded control ≤ 200%</td>
<td></td>
</tr>
<tr>
<td>Glove material</td>
<td>Chemical penetration resistance</td>
<td>ASTM F903 (Section 8.4)</td>
<td>No penetration for at least 1 hour for each of the specified chemicals</td>
<td>See separate table</td>
</tr>
<tr>
<td></td>
<td>Cut resistance</td>
<td>ASTM F1790/F1790M (Section 8.11)</td>
<td>Blade travel distance ≥ 20 mm at 50 g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Puncture resistance</td>
<td>ASTM F1342/F1342M, Method A (Section 8.12)</td>
<td>Puncture force ≥ 11 N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cold temperature performance</td>
<td>ASTM D747 (Section 8.7)</td>
<td>Bending moment ≤ 0.057 N m</td>
<td></td>
</tr>
<tr>
<td>Glove material seams</td>
<td>Chemical penetration resistance</td>
<td>ASTM F903 (Section 8.4)</td>
<td>No penetration for at least 1 hour for each of the specified chemicals</td>
<td>See separate table</td>
</tr>
<tr>
<td>Footwear</td>
<td>Liquidtight integrity</td>
<td>ASTM D5151 with modifications (Section 8.10)</td>
<td>No leakage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toe impact and compression resistance; sole puncture resistance</td>
<td>ASTM F2412</td>
<td>Footwear meets toe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slip resistance</td>
<td>ASTM F2913 (Section 8.16)</td>
<td>Coefficient ≥ 0.40</td>
<td></td>
</tr>
<tr>
<td>Footwear upper materials</td>
<td>Chemical penetration resistance</td>
<td>ASTM F903 (Section 8.4)</td>
<td>No penetration for at least 1 hour for each of the specified chemicals</td>
<td>See separate table</td>
</tr>
<tr>
<td></td>
<td>Cut resistance</td>
<td>ASTM F1790/F1790M (Section 8.11)</td>
<td>Blade travel distance ≥ 20 mm at 350 g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Puncture resistance</td>
<td>ASTM F1342/F1342M, Method A (Section 8.12)</td>
<td>Puncture force ≥ 36 N</td>
<td></td>
</tr>
<tr>
<td>Ensemble or Element</td>
<td>Performance Requirement</td>
<td>Test Method</td>
<td>Requirement</td>
<td>Result</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>Footwear upper material seams</td>
<td>Chemical penetration resistance</td>
<td>ASTM F903 (Section 8.4)</td>
<td>No penetration for at least 1 hour for each of the specified chemicals</td>
<td>See separate table</td>
</tr>
<tr>
<td>Footwear sole and heels</td>
<td>Abrasion resistance</td>
<td>ISO 4649, Method A (Section 8.14)</td>
<td>Relative volume loss ≤ 250 mm$^3$</td>
<td></td>
</tr>
<tr>
<td>Footwear ladder shanks</td>
<td>Bending resistance</td>
<td>Section 8.15</td>
<td>Deflection ≤ 6 mm</td>
<td></td>
</tr>
</tbody>
</table>

**Optional Flash Fire Requirements**

<table>
<thead>
<tr>
<th>Ensemble or Element</th>
<th>Performance Requirement</th>
<th>Test Method</th>
<th>Requirement</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensemble</td>
<td>Overall ensemble flash protection</td>
<td>Section 8.17</td>
<td>Afterflame times ≤ 2 seconds</td>
<td>No liquid penetration Test subject has visual acuity of 20/35 or better through visor and facepiece lens</td>
</tr>
<tr>
<td>Garment material</td>
<td>Heat transfer performance</td>
<td>ASTM F2700 (Section 8.18)</td>
<td>HTP rating ≥ 12 cal/cm$^2$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.19)</td>
<td>After flame time ≤ 2 seconds Burn distance ≤ 100 mm No melting or dripping</td>
<td></td>
</tr>
<tr>
<td>Visor material</td>
<td>Heat transfer performance</td>
<td>ASTM F2700 (Section 8.18)</td>
<td>Average HTP rating ≥ 12 cal/cm$^2$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.19)</td>
<td>After flame time ≤ 2 seconds Burn distance ≤ 100 mm No melting or dripping</td>
<td></td>
</tr>
<tr>
<td>Glove material</td>
<td>Heat transfer performance</td>
<td>ASTM F2700 (Section 8.18)</td>
<td>Average HTP rating ≥ 12 cal/cm$^2$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.19)</td>
<td>After flame time ≤ 2 seconds Burn distance ≤ 100 mm No melting or dripping</td>
<td></td>
</tr>
<tr>
<td>Footwear material</td>
<td>Heat transfer performance</td>
<td>ASTM F2700 (Section 8.18)</td>
<td>Average HTP rating ≥ 12 cal/cm$^2$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.19)</td>
<td>After flame time ≤ 2 seconds Burn distance ≤ 100 mm No melting or dripping</td>
<td></td>
</tr>
<tr>
<td>Interface material</td>
<td>Heat transfer performance</td>
<td>ASTM F2700 (Section 8.18)</td>
<td>Average HTP rating ≥ 12 cal/cm$^2$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flame resistance</td>
<td>ASTM F1358 (Section 8.19)</td>
<td>After flame time ≤ 2 seconds Burn distance ≤ 100 mm No melting or dripping</td>
<td></td>
</tr>
</tbody>
</table>

**Optional Breathability Claim**
<table>
<thead>
<tr>
<th>Ensemble or Element</th>
<th>Performance Requirement</th>
<th>Test Method</th>
<th>Requirement</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garment (or hood) material</td>
<td>Total heat loss</td>
<td>ASTM F1868, Method C (Section 8.20)</td>
<td>Total heat loss (Report only)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Apparent intrinsic evaporative resistance (Report only)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intrinsic thermal resistance (Report only)</td>
<td></td>
</tr>
<tr>
<td>Evaporative resistance</td>
<td></td>
<td>ASTM F1868, Method B (Section 8.25)</td>
<td>Evaporative resistance (Report only)</td>
<td></td>
</tr>
</tbody>
</table>

**Table 5.3.2(b) Format for Reporting Certification Penetration Test Data in Technical Data Package**

<table>
<thead>
<tr>
<th>Chemical (concentration)</th>
<th>Minimum Requirement</th>
<th>Garment Material</th>
<th>Garment Visor</th>
<th>Garment Seam</th>
<th>Garment Closure</th>
<th>Interface Material</th>
<th>Glove Material</th>
<th>Footwear Upper Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butyl acetate, CAS No. 123-86-4, &gt; 95%</td>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimethyl formamide, CAS No. 68-12-2, &gt; 95%</td>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel H (42.5% toluene, 42.5% isooctane, 15% ethanol mixture, v/v)</td>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isopropyl alcohol, CAS No. 67-63-0, &gt; 91%</td>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methyl isobutyl ketone, CAS No. 108-10-1, &gt; 95%</td>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrobenzene, CAS No. 98-95-3, &gt; 95%</td>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium hydroxide, CAS No. 1310-73-2, 50%</td>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium hypochlorite, 10%</td>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfuric acid, CAS No. 7664-93-9, 93.1%</td>
<td>Pass</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Tetrachloroethylene, CAS No. 127-18-4, &gt; 95%</td>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Note: Shaded areas indicate no requirement for testing.

*A pass result indicates no liquid penetration through the tested specimens after a 1-hour exposure with 1-minute of the exposure at 7.8 kPa hydrostatic pressure.*
5.3.2.1
The technical data package information shall indicate “Pass” for those requirements where there is no quantitative value reported and “Not applicable” for specific requirements that do not apply to the liquid splash-protective ensemble.

5.3.2.2
The manufacturer shall be permitted to make modifications in the tabular format to accommodate specific product features or additional materials as applicable to the certified product.

Supplemental Information

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR-73_A.5.3.2.docx</td>
<td></td>
</tr>
</tbody>
</table>

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: Street Address:
City: City:
State: State:
Zip: Zip:
Submittal Date: Thu Jun 23 13:17:06 EDT 2016

Committee Statement

Committee Statement: A standardized format for reporting compliance information is needed to permit end user organizations to easily understand and compare data from different CBRN protective suit manufacturers.

Correlation across 1991, 1992, 1994 and 1999 for each to have the same table representation.

Response
Message:

Ballot Results

✅ This item has passed ballot

30 Eligible Voters
4 Not Returned
24 Affirmative All
2 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Table 5.3.2(a) - needs the CAS # added for sodium hypochlorite. Table 5.3.2(b) - The phrase "elastomeric interface material" is used throughout the standard. Suggest that phrase be used instead of "interface material" in the TDP.

Stull, Jeffrey O.

Should the English equivalent units be provided for this section
Second Revision No. 18-NFPA 1992-2015 [Section No. 5.3.5.2]

5.3.5.2
The manufacturer shall provide, in the technical data package, the list and descriptions of the following ensemble materials and components, if applicable:

(1) Garment material
(2) Visor material
(3) Glove material and type of attachment
(4) Footwear material and type of attachment
(5) Hood material
(6) Zipper/closure type and materials
(7) Material seam types and composition
(8) Exhaust valve types and material(s)
(9) External fitting types and material(s)
(10) External gasket types and material(s)
(11) Outer garment, glove, or boot material(s)
(12) Type or style of head protection accommodated within the suit
(13) Interface materials

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 21:20:43 EST 2015

Committee Statement

Committee Statement: Include interface materials in list of material descriptions
Response Message:
Public Comment No. 26-NFPA 1992-2015 [Section No. 5.3.5.2]
Public Comment No. 44-NFPA 1992-2015 [Section No. 5.3.5.2]

Ballot Results

✓ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
5.3.5.5
The manufacturer shall describe, in the technical data package, the type of seams or methods of attachment for the following garment material and component combinations, if applicable:

1. Garment material–garment material
2. Garment material–visor
3. Garment material–glove
4. Garment material–footwear
5. Garment material–garment closure
6. Outer cover–outer cover
7. Hood material–visor material
8. Hood material–hood material
9. Hood material–garment materials
10. Sock material–garment material (if the sock material is different from the garment material)

Submitter Information Verification
Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Fri Dec 11 21:23:08 EST 2015

Committee Statement
Committee Statement: Need to include hoods to this list. Also need to address socks that are not made from the same material as the garment material.
Response Message: 
Public Comment No. 45-NFPA 1992-2015 [Section No. 5.3.5.5]

Ballot Results
This item has passed ballot

- Eligible Voters: 30
- Not Returned: 4
- Affirmative All: 26
- Affirmative with Comments: 0
- Negative with Comments: 0
- Abstention: 0
Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
6.1.3
Where used, booties shall be designed as an extension of the garment leg or as a separate sock item and shall cover the entire foot and ankle.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 23:05:06 EST 2015

Committee Statement

Committee Statement: Replace bootie with sock
Response Message:
Public Comment No. 12-NFPA 1992-2015 [Section No. 6.1.3]

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
6.1.6* Where the manufacturer designates a suit as “breathable,” the garment and hood (if applicable) composite(s) total heat loss shall be measured as specified in Section 8.20, Total Heat Loss Test, and the garment and hood (if applicable) composite(s)’s evaporative resistance shall be measured as specified in Section 8.23, Evaporative Resistance Test, the results for total heat loss, and evaporative resistance, and insulation value shall be provided in the technical data package, and the additional language regarding suit breathability shall be printed on the product label as required by 5.1.1.10 (10) 5.1.2.3, 5.1.5.3, and 5.1.6.3, or 5.1.7.3.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 21 11:15:29 EDT 2016

Committee Statement

Committee Statement: It is proposed that this information be provided in the manufacturer’s Technical Data Package along with other data demonstrating the compliance of the product to the standard. Instead of the THL value, recommendation is made that the words “Breathable (see manufacturer’s Technical Data Package)” be placed on the label. This approach for formatting this information provides a more suitable format for indicating breathable of the garment.

Public Comment No. 52-NFPA 1992-2015 [Section No. 6.1.6]

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Negative with Comment
Lovasic, Susan L.
The TC agreed to have "apparent intrinsic evaporative resistance" and "intrinsic thermal resistance" reported. These parameters are also listed in the TDP requirements. Therefore section 6.1.1 should be edited to add in reporting of apparent intrinsic evaporative resistance and intrinsic thermal resistance values.
6.3.5

Booties, where provided, as a separate sock Socks shall cover the entire foot and ankle and shall provide protection when worn in conjunction with an outer boot.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 23:03:34 EST 2015

Committee Statement

Committee Statement: Replace bootie with sock
Response Message:

Public Comment No. 11-NFPA 1992-2015 [Section No. 6.3.5]
Public Comment No. 13-NFPA 1992-2015 [Section No. 6.3.5]

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
| Daly, Jr., Richard P.          |
| Del Re, Nicholas             |
| Fithian, William A.          |
| Green, Dustin                |
| Haines, Todd W.              |
| Harkness, A. Ira             |
| Haskell, III, William E.     |
| Hirsche, Ryan C.             |
| Kerbow, Kyle                 |
| Kienzle, Michael P.          |
| Kirsteins, Andra             |
| Lancaster, Beth C.           |
| Lehtonen, Karen E.           |
| Lovasic, Susan L.            |
| Mann, Philip C.              |
| Nystrom, Ulf                 |
| Rogers, Paul G.              |
| Shelton, Robert E.           |
| Stull, Jeffrey O.            |
| West, Robert                 |
| Wisner, Jr., John E.         |
| Zeigler, James P.            |
| Ziskin, Michael              |
6.3.11
Toe impact–resistant, compression resistant, and sole puncture–resistant components shall be integral and nonremovable parts of the footwear.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 23 13:34:56 EDT 2016

Committee Statement

Committee Statement: This information is being removed as it is redundant to information in chapters 7 and 8.
Response Message:

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Where socks are used as part of a nonencapsulating protective ensemble, the manufacturer shall permit the use of any NFPA 1992 footwear element, or any outer boot of the footwear element that is certified to NFPA 1951, NFPA 1971, NFPA 1991, or NFPA 1994, that also meets the minimum height requirement specified in 6.3.2.

If the manufacturer chooses to provide open choices of footwear as permitted in 6.4.4.2, then the product label shall have an additional warning as stipulated in 5.1.5.3.
North, John W.
Thompson, Donald B.

**Affirmative All**
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Encapsulating ensembles shall include an integral hood with visor and shall include attached gloves and attached footwear or footwear consisting of an attached sock and separate outer boot.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 21:34:06 EST 2015
Committee Statement

Committee Statement: Encapsulating garments with attached socks and removable outer footwear are an acceptable design for this standard.
Response Message:

Public Comment No. 46-NFPA 1992-2015 [Section No. 6.5.3]
Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
6.5.5
Footwear elements of encapsulating ensembles shall meet the design requirements specified in Section 6.3, Protective Footwear Elements and Items Design Requirements.

6.5.5.1
Attached footwear shall be permitted to be booties. Where socks are used as part of an encapsulating protective ensemble, the manufacturer shall permit the use of any NFPA 1992 footwear element, or any outer boot of the footwear element that is certified to NFPA 1951, NFPA 1971, NFPA 1991, or NFPA 1994, that also meets the minimum height requirement specified in 6.3.2.

6.5.5.2
Where booties are provided in the construction of the encapsulating ensemble, the manufacturer shall specify types of compliant outer footwear that provide the performance requirements for footwear specified in 7.3.3 through 7.3.7, 7.3.9, and 7.3.10. If the manufacturer chooses to provide open choices of footwear as permitted in 6.5.5.1, then the product label shall have an additional warning as stipulated in 5.1.6.3.
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
6.6 Optional Chemical Flash Fire Protection Design Requirements.

6.6.1 Where liquid splash–protective ensembles or elements rely on external clothing items or multiple layers to meet the performance requirements in Section 7.6, Optional Chemical Flash Fire Protection Performance Requirements, the ensemble or elements shall be designed so that all layers or separate parts are securely attached and provided as a single and integrated unit.

6.6.2 Liquid splash–protective ensembles shall be tested with the glove and footwear elements specified by the manufacturer, which are also listed on the product label as required in 5.1.11.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 23 13:51:37 EDT 2016

Committee Statement

Committee Statement: While the Technical Committee agrees with the submitter that a larger number of footwear options should be afforded to first responders when the ensemble includes booties that already meet the liquid chemical penetration resistance requirements of the standard as well as other properties established for garment materials, it has proposed alternative language to permit the use of other certified footwear and modified the requirements in the testing to make it easier for manufacturers to specify a larger range of footwear as part of ensembles. Additional correlating items regarding the performance requirements for ASTM F2412 have also been addressed.

Response Message:

Ballot Results

☑ This item has passed ballot

- 30 Eligible Voters
- 4 Not Returned
- 26 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

**Affirmative All**
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
7.1.9 Elastomeric Interface Gasket Material Requirements.

7.1.9.1* Elastomeric interface materials shall have an elongation at rupture of not less than 125 percent when tested according to Section 8.21, Ultimate Tensile Strength Test.

7.1.9.2 Where the garment includes interface gaskets, each elastomeric interface gasket material shall be tested for penetration resistance as specified in Section 8.4, Chemical Penetration Resistance Test, and shall exhibit no penetration for at least 1 hour for each of the specified chemicals and each additional chemical or specific chemical mixture for which the manufacturer is certifying the garment.

7.1.9.3 Where the garment includes elastomeric interface gaskets, each elastomeric interface gasket material shall be tested for cut resistance as specified in Section 8.11, Cut Resistance Test, and shall have a blade travel distance of not less than 20 mm (0.8 in.)

7.1.9.4 Where the garment includes elastomeric interface gaskets, each elastomeric interface gasket material shall be tested for puncture resistance as specified in Section 8.12, Puncture Resistance Test 1, and shall have a puncture resistance of not less than 97 N (31.6 lbf).

7.1.9.5 Where the garment includes elastomeric interface gaskets, each exposed elastomeric interface gasket material shall be tested for ultimate tensile strength as specified in Section 8.21, Ultimate Tensile Strength Test, and shall have an ultimate tensile strength of not less than 54 MPa (7850 lbf).

7.1.9.6 Where the garment includes elastomeric interface materials, each elastomeric interface material shall be tested for cold weather performance as specified in Section 8.7, Cold Temperature Performance Test 1, and shall have a bending moment of not greater than 0.057 N·m (0.50 in.·lbf) at an angular deflection of 60 degrees and –25°C (~13°F).
Committee Statement:
1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers. 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Affirmative with Comment
Stull, Jeffrey O.
The correct conversion of 4 MPa in 7.1.9.5 is 580 psi
7.3.9
Sample footwear toes shall be tested for impact and compression resistance as specified in Section 8.23, Impact and Compression Test, and shall have an impact resistance of not less than 101.7 J (75 ft-lb) and a compression resistance of not less than 11,121 N (2500 lbf). Footwear shall meet the performance requirements specified in ASTM F2413, Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear, for impact-, compression-, and puncture-resistant footwear with the exception that flex resistance to cracking shall not be evaluated. Testing shall be performed as specified in ASTM F2412, Standard Test Methods for Foot Protection.

7.3.10
The puncture resistance device shall be tested for puncture resistance as specified in Section 8.24, Puncture Resistance Test Two, and shall not show a puncture.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Jun 23 13:56:11 EDT 2016

Committee Statement

Committee Statement: While the Technical Committee agrees with the submitter that a larger number of footwear options should be afforded to first responders when the ensemble includes booties that already meet the liquid chemical penetration resistance requirements of the standard as well as other properties established for garment materials, it has proposed alternative language to permit the use of other certified footwear and modified the requirements in the testing to make it easier for manufacturers to specify a larger range of footwear as part of ensembles. Additional correlating items regarding the performance requirements for ASTM F2412 have also been addressed.

Response Message:

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

**Affirmative All**
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
7.4.4 Footwear elements of nonencapsulating ensembles shall meet the performance requirements specified in Section 7.3, Protective Footwear Elements and Items Performance Requirements.

7.4.4.1 Where socks are used as part of a nonencapsulating protective ensemble and the manufacturer permits the use of any outer boot of the footwear element that is certified to NFPA 1951, NFPA 1971, NFPA 1991, or NFPA 1994, the outer boot of the footwear element shall meet the minimum height requirement specified in 6.3.2.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Jun 23 13:59:15 EDT 2016

Committee Statement

Committee Statement: While the Technical Committee agrees with the submitter that a larger number of footwear options should be afforded to first responders when the ensemble includes booties that already meet the liquid chemical penetration resistance requirements of the standard as well as other properties established for garment materials, it has proposed alternative language to permit the use of other certified footwear and modified the requirements in the testing to make it easier for manufacturers to specify a larger range of footwear as part of ensembles. Additional correlating items regarding the performance requirements for ASTM F2412 have also been addressed.

Response Message:

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
7.4.5 Where the ensemble includes interface gaskets, each interface gasket material shall be tested for penetration resistance as specified in Section 8.14, Chemical Penetration Resistance Test, and shall exhibit no penetration for at least 1 hour for each of the specified chemicals and each additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble.

7.4.6 Where the ensemble includes interface gaskets, each interface gasket material shall be tested for cut resistance as specified in Section 8.11, Cut Resistance Test, and shall have a blade travel distance of not less than 20 mm (0.8 in.).

7.4.7 Where the ensemble includes interface gaskets, each interface gasket material shall be tested for puncture resistance as specified in Section 8.12, Puncture Resistance Test 1, and shall have a puncture resistance of not less than 9 N (3 lbf).

7.4.8 Where the ensemble includes interface gaskets, each interface gasket material shall be tested for ultimate tensile strength as specified in Section 8.22, Ultimate Tensile Strength Test, and shall have an ultimate tensile strength of not less than 5 MPa (725 psi).

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Sat Jun 25 06:28:48 EDT 2016

Committee Statement

Committee Statement: 1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message: 

Ballot Results

☑ This item has passed ballot
30 Eligible Voters
4 Not Returned
26 Affirmative All
  0 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
7.5.4
Footwear elements of encapsulating ensembles shall meet the performance requirements specified in Section 7.3, Protective Footwear Elements and Items Performance Requirements.

7.5.4.1
Where socks are used as part of an encapsulating protective ensemble and the manufacturer permits the use of any outer boot of the footwear element that is certified to NFPA 1951, NFPA 1971, NFPA 1991, or NFPA 1994, the outer boot of the footwear element shall meet the minimum height requirement specified in 6.3.2.

Submitter Information Verification
Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 23 14:01:05 EDT 2016

Committee Statement
Committee Statement: While the Technical Committee agrees with the submitter that a larger number of footwear options should be afforded to first responders when the ensemble includes booties that already meet the liquid chemical penetration resistance requirements of the standard as well as other properties established for garment materials, it has proposed alternative language to permit the use of other certified footwear and modified the requirements in the testing to make it easier for manufacturers to specify a larger range of footwear as part of ensembles. Additional correlating items regarding the performance requirements for ASTM F2412 have also been addressed.

Response Message:

Ballot Results
This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
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<td>Ziskin, Michael</td>
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### Second Revision No. 87-NFPA 1992-2016 [Sections 7.5.5, 7.5.6, 7.5.7, 7.5.8]

#### 7.5.5

Where the ensemble includes interface gaskets, each interface gasket material shall be tested for penetration resistance as specified in Section **8.4**, Chemical Penetration Resistance Test, and shall exhibit no penetration for at least 1 hour for each of the specified chemicals and each additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble.

#### 7.5.6

Where the ensemble includes interface gaskets, each interface gasket material shall be tested for cut resistance as specified in Section **8.11**, Cut Resistance Test, and shall have a blade travel distance of not less than 20 mm (0.8 in.).

#### 7.5.7

Where the ensemble includes interface gaskets, each interface gasket material shall be tested for puncture resistance as specified in Section **8.12**, Puncture Resistance Test 1, and shall have a puncture resistance of not less than 9 N (3 lbf).

#### 7.5.8

Where the ensemble includes interface gaskets, each interface gasket material shall be tested for ultimate tensile strength as specified in Section **8.22**, Ultimate Tensile Strength Test, and shall have an ultimate tensile strength of not less than 5 MPa (725 psi).

---

**Submitter Information Verification**

**Submitter Full Name:** Thomas McGowan  
**Organization:** National Fire Protection Assoc  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sat Jun 25 06:31:12 EDT 2016

**Committee Statement**

1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

**Response Message:**

**Ballot Results**

- This item has passed ballot
30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
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Affirmative All
Allen, Jason L.
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Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 113-NFPA 1992-2016 [Sections 7.6.3, 7.6.4, 7.6.5]

7.6.3
Garment materials and, where applicable, visor, glove, footwear, and elastomeric interface gasket materials shall be tested for heat transfer performance (HTP) as specified in Section 8.18, Heat Transfer Performance Test, and shall have an average HTP rating of not less than 12 cal/cm².

7.6.4
Specimen garments shall be tested for overall HTP as specified in Section 8.21, Overall Heat Transfer Performance Test, and shall have an average predicted body burn of not more than 25 percent based on the total surface area covered by sensors, excluding hands and feet.

Committee Statement
1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow “less-than-perfect” mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers. 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Additionally, research is needed to properly apply an instrumented manikin test for the evaluation of full body protective garments and ensembles for the measurement of predicted burn injury given configurational challenges of putting samples onto test manikins.

Ballot Results
✔ This item has passed ballot
30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
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Nystrom, Ulf
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Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 90-NFPA 1992-2016 [Sections 7.7.2, 7.7.3, 7.7.4, 7.7.5]

7.7.2 Where the hood includes an interface gasket, the interface gasket material shall be tested for penetration resistance as specified in Section 8.4, Chemical Penetration Resistance Test, and shall exhibit no penetration for at least 1 hour for each of the specified chemicals and each additional chemical or specific chemical mixture for which the manufacturer is certifying the ensemble.

7.7.3 Where the hood includes an interface gasket, the interface gasket material shall be tested for cut resistance as specified in Section 8.11, Cut Resistance Test, and shall have a blade travel distance of not less than 20 mm (0.8 in.).

7.7.4 Where the hood includes an interface gasket, the interface gasket material shall be tested for puncture resistance as specified in Section 8.12, Puncture Resistance Test 1, and shall have a puncture resistance of not less than 9 N (3 lbf).

7.7.5 Where the hood includes an interface gasket, the interface gasket material shall be tested for ultimate tensile strength as specified in Section 8.22, Ultimate Tensile Strength Test, and shall have an ultimate tensile strength of not less than 5 MPa (725 psi).

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jun 25 06:33:45 EDT 2016

Committee Statement

Committee Statement: 1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

☑ This item has passed ballot
30 Eligible Voters
4 Not Returned
26 Affirmative All
  0 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

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Buck, Ted S.
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Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.1.5 Flexural Fatigue Procedure for Gloves.
Sample gloves shall be subjected to one full cycle of dexterity testing in accordance with the procedures specified in 8.1.4 Section 8.13, Gloved Hand Dexterity Test, of this standard.

8.1.6 Flexural Fatigue Procedure for Footwear.
Footwear upper materials Sample footwear shall be subjected to 100,000 flexes in accordance with Appendix B of FIA Standard 1209, Whole Shoe Flex, with the procedure specified in 8.1.4, following modifications:

1. Water shall not be used.
2. The flex speed shall be 60 cycles, ±2 cycles per minute.
3. Alternative flexing equipment shall be permitted to be used when the flexing equipment meets the following parameters:
   (a) Is capable of providing the angle of flex as described in FIA 1209
   (b) Is capable of a flex speed of 60 cycles, ±2 cycles per minute
   (c) Provides a means of securing the footwear during flexing

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Dec 11 22:11:11 EST 2015

Committee Statement

Committee Statement: While the committee removed the referenced sections due to their impracticality of being performed in conjunction with liquid penetration resistance testing, these conditioning methods were also applied to the overall liquid integrity evaluations of both gloves and footwear and therefore should be retained.

Response Message:

Public Comment No. 73-NFPA 1992-2015 [Global Input]

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
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Daly, Jr., Richard P.
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Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.2.4 Apparatus.

The apparatus and supplies for testing shall be those specified in ASTM F1359/F1359M, Standard Test Method for Measuring Liquid Penetration Resistance of Protective Clothing or Protective Ensembles Under a Shower Spray While on a Mannequin Manikin, using the following modifications:

The surface tension of the water used in testing shall be determined before each series of tests in accordance with ASTM D1331, Test Methods for Surface and Interfacial Tension of Solutions of Surface-Active Agents, and shall be 32 dynes/cm, ±2 dynes/cm (32 N/m, ±2 N/m).

The shower system shall include a means for monitoring the liquid flow during the test.

The top nozzle shall be positioned 46 mm (18 in.) above the top of the manikin’s head.

A laser pointing device shall be used for positioning each nozzle with respect to the manikin.

A human-form, articulated manikin that meets all of the following shall be selected for testing the garment or ensemble:

- The manikin shall be sized to meet the dimensions provided in Table 8.2.4.
- The manikin shall have articulation at least at the shoulders, elbows, hips, and knees.
- The manikin shall have a removable, non-rotating head, removable pliable hands, and removable feet.
- The manikin shall have a water resistant coating.

The liquid absorptive garment shall cover all portions of the manikin that are covered by the test specimen and meet both of the following:

- The liquid absorptive garment shall be constructed of medium gray, 100 percent cotton, 95 percent cotton/5 percent polyester, or 90 percent cotton/10 percent polyester, sweatshirt fleece fabric that has been laundered a minimum of 10 times per AATCC 135, Dimensional Changes in Automated Home Laundering of Woven and Knitted Fabrics, using Machine Cycle 1, Wash Temperature V, and Drying Procedure Ai.

- A hood on the liquid absorptive garment shall be provided where the garment or ensemble has an integrated or separate hood.

A platform, on which the manikin feet are secured, shall be used to permit positioning of the manikin with respect to the liquid spray. The platform shall have a means allowing the rotation of the manikin in each of the required orientations while maintaining the manikin securely.

Table 8.2.4 Manikin Dimensions

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<td>Height (from floor)</td>
<td>1828</td>
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<td>Chest circumference</td>
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<td>Shoulder circumference</td>
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<td>Crotch height</td>
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<td>Shrank length</td>
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<tr>
<td>Ankle-height</td>
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<tr>
<td>Arm span</td>
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</tr>
</tbody>
</table>

*All dimensions ± 2 mm.

Submitter Information Verification

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
Committee Statement

Committee Statement: The proposed changes align the test method apparatus and procedures with recently introduced changes in the referenced ASTM Test Method.

Ballot Results

☑ This item has passed ballot

- 30 Eligible Voters
- 4 Not Returned
- 26 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
8.2.5 Procedure.

Liquidtight integrity testing of garments shall be conducted in accordance with Procedure A of ASTM F1359/F1359M, Standard Test Method for Measuring Liquid Penetration Resistance of Protective Clothing or Protective Ensembles Under a Shower Spray While on a Mannequin Manikin, with the following modifications:

1. No provisions for garments with a partial barrier layer shall be allowed.
2. The method used for mounting the manikin in the spray chamber shall not interfere with the water spray.
3. The suited manikin shall be exposed to the liquid spray for a total of 20 minutes, 5 minutes in each of the four specified manikin orientations.
   - At the end of the liquid spray exposure period, excess liquid shall be removed from the surface of the specimen.
   - The specimen shall be inspected within 5 minutes of the end of the liquid spray exposure period for evidence of liquid penetration. Only light pressure shall be applied with wiping the exterior of the manikin following the liquid exposure.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 21 14:19:10 EDT 2016

Committee Statement

Committee Statement: The proposed changes align the test method apparatus and procedures with recently introduced changes in the referenced ASTM Test Method.

Ballot Results

✓ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention
Not Returned
Buck, Ted S.
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Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.2.8.3
The left arm of the manikin shall be positioned with the upper arm against the side of the manikin and the lower arm bent at the elbow upward at a 135-degree angle throughout the test duration.

Submitter Information Verification
Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jun 21 13:51:19 EDT 2016

Committee Statement
Committee Statement: clarity.
Response Message:

Ballot Results
This item has passed ballot
30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
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Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 80-NFPA 1992-2016 [New Section after 8.2.8.5]

8.2.8.6 Where socks are used as part of the nonencapsulating protective ensemble, it shall be permitted that testing be performed on only one representative outer boot style for the evaluation of the ensemble.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 23 14:05:28 EDT 2016

Committee Statement

Committee Statement: While the Technical Committee agrees with the submitter that a larger number of footwear options should be afforded to first responders when the ensemble includes booties that already meet the liquid chemical penetration resistance requirements of the standard as well as other properties established for garment materials, it has proposed alternative language to permit the use of other certified footwear and modified the requirements in the testing to make it easier for manufacturers to specify a larger range of footwear as part of ensembles. Additional correlating items regarding the performance requirements for ASTM F2412 have also been addressed.

Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

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Affirmative All
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<td>Wisner, Jr., John E.</td>
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<td>Zeigler, James P.</td>
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<td>Ziskin, Michael</td>
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</table>
Second Revision No. 62-NFPA 1992-2016 [Section No. 8.2.9.2]

8.2.9.2
The left arm of the manikin shall be positioned with the upper arm against the side of the manikin and the lower arm bent at the elbow upward at a 135-degree angle throughout the test duration.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 21 13:52:44 EDT 2016

Committee Statement

Committee Statement: clarity
Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
8.2.9.5
Where socks are used as part of the encapsulating protective ensemble, it shall be permitted that testing be performed on only one representative outer boot style for the evaluation of the ensemble.

Submitter Information Verification

Submitter Full Name: Thomas McGowan  
Organization: National Fire Protection Assoc  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Thu Jun 23 14:06:29 EDT 2016

Committee Statement

Committee Statement: While the Technical Committee agrees with the submitter that a larger number of footwear options should be afforded to first responders when the ensemble includes booties that already meet the liquid chemical penetration resistance requirements of the standard as well as other properties established for garment materials, it has proposed alternative language to permit the use of other certified footwear and modified the requirements in the testing to make it easier for manufacturers to specify a larger range of footwear as part of ensembles. Additional correlating items regarding the performance requirements for ASTM F2412 have also been addressed.

Response Message:

Ballot Results

This item has passed ballot

30 Eligible Voters  
4 Not Returned  
26 Affirmative All  
0 Affirmative with Comments  
0 Negative with Comments  
0 Abstention

Not Returned  
Buck, Ted S.  
Greene, Russell R.  
North, John W.  
Thompson, Donald B.

Affirmative All
8.3.3.2
At least three specimens shall be tested.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jun 21 14:23:46 EDT 2016

Committee Statement

Committee Statement: editorial
Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.3.5.1

Overall function and integrity shall be measured in accordance with ASTM F1154, Standard Practices for Qualitatively Evaluating the Comfort, Fit, Function, and Integrity Durability of Chemical Protective Suit Ensembles and Ensemble Components, with the following parameters:

(1) Both Exercise Procedures A and B, specified in ASTM F1154, shall be used.

(2) Specimens to be tested shall meet the sizing range of the test subjects as determined in 5.3.4.

(3) Specimens shall be donned in accordance with the manufacturer’s instructions.

(4) Testing shall be conducted at 25°C, ±6°C (77°F, ±10°F) and relative humidity of 50 percent, ±20 percent.

(5) Liquidtight integrity shall be measured as specified in Section 8.2 after the exercise procedures are completed.

(6) Where hoods are part of the garment or ensemble, or are evaluated as separate items, test subjects shall wear head protection devices meeting the dimensional requirements of Type 1, Class G helmets of ANSI/ISEA Z89.1, American National Standard for Industrial Head Protection, while performing exercise procedures.

(7) Test subjects shall wear a full-body coverall and shall wear underclothing in accordance with the manufacturer’s recommendation, and a full-body coverall shall be worn.

(8) Where encapsulating ensembles are evaluated or the respirator is not otherwise specified, test subjects shall wear respirators that are certified as compliant with NFPA 1981 or NFPA 1986.

(9) Where nonencapsulating ensembles are evaluated or hoods integrate with the facepiece of the respirator, test subjects shall wear the respirators specified by the manufacturer.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 21 14:26:39 EDT 2016

Committee Statement

Committee Statement: grammar clarity. Also, a reference has been added for NFPA 1986 for addressing an alternative form of respirator suitable for use with NFPA 1992 encapsulating ensembles.

Response Message:

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
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Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 91-NFPA 1992-2016 [Section No. 8.4.1.1]

8.4.1.1 This test method shall apply to garment materials, garment seams, visor materials, glove materials, footwear materials, garment closure assemblies, hood materials, and elastomeric interface gasket materials.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jun 25 06:35:29 EDT 2016

Committee Statement

Committee Statement: 1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

**Affirmative All**

Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
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Kienzle, Michael P.
Kirsteins, Andra
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Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.4.1.4
Modifications to this test method for testing glove materials after flexing and abrading shall be as specified in 8.4.9.

8.4.1.5
Modifications to this test method for testing footwear materials after flexing and abrading shall be as specified in 8.4.10.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 06 12:29:36 EDT 2016

Committee Statement

Committee Statement: editorial
Response Message:

Ballot Results

✔️ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Second Revision No. 92-NFPA 1992-2016 [Section No. 8.4.1.9]

8.4.1.9
Modifications to this test method for testing elastomeric interface gasket materials shall be as specified in 8.4.14.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Sat Jun 25 06:36:21 EDT 2016

Committee Statement

Committee Statement:
1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia).
Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers.
3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
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Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.4.4.1*

Penetration testing shall be conducted against the following liquid chemicals with chemical abstract service (CAS) numbers, at the specified concentrations:

1. Butyl acetate, CAS No. 123-86-4, >95 percent, w/w
2. Dimethyl formamide, CAS No. 68-12-2, >95 percent, w/w
3. Fuel C (Toluene/isooctane mixture, 50/50 v/v), surrogate gasoline fuel C. Fuel H — surrogate gasoline (42.5 percent toluene, 42.5 percent isooctane, and 15 percent denatured ethanol, v/v), as defined in ASTM D471, Standard Test Method for Rubber Property-Effect of Liquids
4. Isopropyl alcohol, CAS No. 67-63-0, >91 percent, w/w
5. Methyl isobutyl ketone, CAS No. 108-10-1, >95 percent, w/w
6. Nitrobenzene, CAS No. 98-95-3, >95 percent, w/w
7. Sodium hydroxide, CAS No. 1310-73-2, 50 percent, w/w
8. Sodium hypochlorite, 10 percent (made within 72 hours of use), w/w
9. Sulfuric acid, CAS No. 7664-93-9, 93.1 percent, w/w
10. Tetrachloroethylene, CAS No. 127-18-4, >95 percent, w/w

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 21 09:32:40 EDT 2016

Committee Statement

Committee Statement: Correction to maintain same fuel through out document.
Response Message:

Ballot Results

✓ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention
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<td>Ziskin, Michael</td>
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<tr>
<td>Lovasic, Susan L.</td>
<td>Affirmative with Comment</td>
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<td>Need to add CAS # for sodium hypochlorite.</td>
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</table>
8.4.9 Specific Requirements for Testing Glove Materials After Flexing and Abrading.

8.4.9.1 Samples for conditioning shall be whole gloves or glove materials representative of glove construction.

8.4.9.2 Samples shall first be conditioned by flexing as specified in 8.1.3.

8.4.9.2 Following flexing, a new sample shall be cut from the flexed sample that measures 75 mm × 230 mm (3 in. × 9 in.). A new sample shall be cut from the whole glove or glove material sample that measures 75 mm × 230 mm (3 in. × 9 in.). The new sample should provide homogeneity across the entire area.

8.4.9.3 The new samples shall then be conditioned by abrading as specified in 8.1.4.

8.4.9.4 Following abrasion, only one specimen for penetration resistance testing shall be taken from each sample subjected to abrasion.

8.4.9.5 The penetration test specimen shall be taken from the exact center of the abraded sample so that the center of the penetration test and the center of the abraded sample coincide.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 23 13:23:07 EST 2015

Committee Statement

Committee Statement: The committee recognized that the earlier edition flexing procedures for both gloves and footwear do not yield the intended results because the nature the samples prevents flexing portions of either gloves or footwear that provide adequate specimens for both abrasion and liquid penetration resistance testing. As no specific replacement flexing criteria have been developed, is recommended that these two sections be deleted. The proposed change removes the flexing procedure as a preconditioning technique for gloves.

Response Message: Public Comment No. 55-NFPA 1992-2015 [Section No. 8.4.9]

Ballot Results
✓ This item has passed ballot
30 Eligible Voters
4 Not Returned
25 Affirmative All
  1 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Stull, Jeffrey O.
In 8.9.4.2, "should" be replaced by "shall" or see language in 8.4.10.3
8.4.10 Specific Requirements for Testing Footwear Materials After Flexing and Abrading.

8.4.10.1
This test shall apply to all types of footwear configurations. If the footwear incorporates a bootie sock constructed of garment material, the garment material penetration resistance test shall be permitted to be substituted for this test.

8.4.10.2
Samples for conditioning shall be whole footwear items or footwear materials representative of the footwear upper construction.

8.4.10.3
Samples shall first be conditioned by flexing as specified in 8.1.3.

8.4.10.4
Following flexing, new samples shall be taken in areas from the footwear upper where the greatest flexing occurred, usually at the footwear quarter or vamp, measuring 75 mm × 230 mm (3 in. × 9 in.). New samples shall be taken in areas from the footwear or footwear material measuring 75 mm × 230 mm (3 in. × 9 in.). An attempt shall be made to choose new samples from areas that are homogeneous.

8.4.10.5
The new samples shall then be conditioned by abrading as specified in 8.1.4.

8.4.10.6
Following abrasion, only one specimen for penetration resistance testing shall be taken from each sample subjected to abrasion.

8.4.10.7
The penetration test specimen shall be taken from the exact center of the abraded sample so that the center of the penetration test and the center of the abraded sample coincide.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 23 13:24:00 EST 2015

Committee Statement

Committee Statement: The committee recognized that the earlier edition flexing procedures for both gloves and footwear do not yield the intended results because the nature the samples prevents flexing portions of either gloves or footwear that provide adequate specimens for both abrasion and liquid penetration resistance testing. As no specific replacement flexing criteria have been developed, is recommended that these two sections be deleted. The proposed change removes the flexing procedure as a preconditioning technique for footwear.
Response
Message:
Public Comment No. 56-NFPA 1992-2015 [Section No. 8.4.10]

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.4.11.7
Sample seams shall be evaluated against a subset of the chemicals specified in 8.4.4.1 that shall include the following:

1) Fuel H — surrogate gasoline (42.5 percent toluene, 42.5 percent isoctane, and 15 percent denatured ethanol, v/v), as defined in ASTM D471, Standard Test Method for Rubber Property-Effect of Liquids

2) Methyl isobutyl ketone, CAS No. 108-10-1, >95 percent, w/w

3) Sulfuric acid, CAS No. 7664-93-9, 93.1 percent, w/w

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sun Dec 13 08:47:21 EST 2015

Committee Statement

Committee Statement: The 2012 edition of NFPA 1992 specified liquid penetration testing of seams against only two chemicals that included isopropanol and concentrated sulfuric acid. As part of the proposed revision of NFPA 1992, and larger more appropriate list of liquid chemical challenges has been established. However, the same principle for using a subset of those chemicals in seams and closures testing should be applied. The proposed three chemicals include the two former chemicals that were used for seam and closure testing plus one additional chemical that represents a hydrocarbon mixture that is likely to affect seam adhesives if glue is used in the construction of the seam. The isopropanol challenge represents the lowest surface tension chemical of the battery while the sulfuric acid represents a relatively concentrated corrosive.

Response Message:

Public Comment No. 57-NFPA 1992-2015 [New Section after 8.4.11.6]

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention
Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kenzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Ziegler, James P.
Ziskin, Michael

Affirmative with Comment
Lovasic, Susan L.
The text in section 8.4.11.6 is exactly the same as that in section 8.4.12.3. Remove one or the other.
Second Revision No. 43-NFPA 1992-2015 [New Section after 8.4.12.2]

**8.4.12.3**

Sample seams shall be evaluated against a subset of the chemicals specified in 8.4.4.1 that shall include the following:

1. **Fuel H** — surrogate gasoline (42.5 percent toluene, 42.5 percent isoctane, and 15 percent denatured ethanol, v/v), as defined in ASTM D471, *Standard Test Method for Rubber Property-Effect of Liquids*
2. **Methyl isobutyl ketone**, CAS No. 108-10-1, >95 percent, w/w
3. **Sulfuric acid**, CAS No. 7664-93-9, 93.1 percent, w/w

Submitter Information Verification

**Submitter Full Name:** Thomas McGowan  
**Organization:** National Fire Protection Assoc  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sun Dec 13 08:55:29 EST 2015

Committee Statement

**Committee Statement:** The 2012 edition of NFPA 1992 specified liquid penetration testing of seams against only two chemicals that included isopropanol and concentrated sulfuric acid. As part of the proposed revision of NFPA 1992, and larger more appropriate list of liquid chemical challenges has been established. However, the same principle for using a subset of those chemicals in seams and closures testing should be applied. The proposed three chemicals include the two former chemicals that were used for seam and closure testing plus one additional chemical that represents a hydrocarbon mixture that is likely to affect seam adhesives if glue is used in the construction of the seam. The isopropanol challenge represents the lowest surface tension chemical of the battery while the sulfuric acid represents a relatively concentrated corrosive.

Response Message:


Ballot Results

- This item has passed ballot
- 30 Eligible Voters
- 4 Not Returned
- 25 Affirmative All
- 1 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention
Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Lovasic, Susan L.
The text in section 8.4.11.6 is exactly the same as that in section 8.4.12.3. Remove one or the other.
Second Revision No. 93-NFPA 1992-2016 [Section No. 8.4.14]

8.4.14 Specific Requirements for Testing Elastomeric Interface Gasket Materials.
Specimens shall be taken from elastomeric interface gasket sheet material or formed interface gaskets that are representative of the gasket material nominal thickness and composition.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jun 25 06:38:04 EDT 2016

Committee Statement

Committee Statement: 1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers. 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
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<td>Thompson, Donald B.</td>
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<td><strong>Affirmative All</strong></td>
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<td>Allen, Jason L.</td>
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<td>Clifford, Brian J.</td>
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<td>Wisner, Jr., John E.</td>
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<td>Zeigler, James P.</td>
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<tr>
<td>Ziskin, Michael</td>
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</tbody>
</table>
8.6.1.2
Where the protective garment or hood is constructed of several layers, all layers shall be assembled in the order in which they appear in the garment or hood, and shall be tested as a composite.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jun 21 15:03:25 EDT 2016

Committee Statement

Committee Statement: spacing editorial
Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
8.7.1 Application.
This test method shall apply to garment, hood, elastomeric interface, and glove materials.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Sat Jun 25 06:40:19 EDT 2016

Committee Statement

Committee Statement:
1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia).
Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers. 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of a compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
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Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
This test method shall apply to glove, footwear upper, and elastomeric interface gasket materials.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jun 25 06:41:25 EDT 2016

Committee Statement

Committee Statement:
1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers. 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
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Corrado, Steven D.
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Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.11.1.4
Modifications to this test method for evaluation of elastomeric interface gasket materials shall be as specified in 8.11.9.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jun 25 06:42:16 EDT 2016

Committee Statement

Committee Statement:
1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers. 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of合规的ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
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Hirschey, Ryan C.
Kerbow, Kyle
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Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.11.9 Specific Requirements for Testing Elastomeric Interface Gasket Materials.

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

8.11.9.2 Cut resistance shall be performed under a load of 50 g (1.75 oz).

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc

Committee Statement

Committee Statement: 1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message: 

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Buck, Ted S.
Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
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Lancaster, Beth C.
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Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Lovasic, Susan L.

Missing text "and composition". Not just thickness should be listed. See Section 8.4.14 for full and complete wording. This correction is also needed for sections 8.12.9.1 and 8.21.2.1.
8.12.1.1
This test shall be applied to glove, footwear upper, and gasket elastomeric interface materials.

Submitter Information Verification
Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jun 25 06:45:24 EDT 2016

Committee Statement
Committee Statement:
1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. The phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers. 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results
☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.12.1.4
Modifications to this test method for evaluation of gasket elastomeric interface materials shall be as specified in 8.12.9.

Submitter Information Verification
Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Sat Jun 25 06:46:20 EDT 2016

Committee Statement
Committee Statement: 1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers. 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results
✓ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
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Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.17.5.1
Prior to testing each day, thermocouples shall be placed in the empty chamber so that temperature measurements are taken at the following heights from the floor: 30 cm (12 in.), 7.6 cm (3 in.), 122 cm (48 in.), 168 cm (66 in.), and 213 cm (84 in.). All heights are \( \pm 2.5 \) cm (\( \pm 1 \) in.).

8.17.5.2
2. A data acquisition system shall be used to collect the temperature readings during the burn exposure and shall be sufficient to provide at least 1 temperature reading per second for each thermocouple used.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 21 13:59:20 EDT 2016

Committee Statement

Committee Statement: grammar and editorial.
Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
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North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
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<td>Daly, Jr., Richard P.</td>
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<td>Del Re, Nicholas</td>
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<td>Haines, Todd W.</td>
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<td>Harkness, A. Ira</td>
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<td>Lehtonen, Karen E.</td>
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<td>Wisner, Jr., John E.</td>
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<td>Zeigler, James P.</td>
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<tr>
<td>Ziskin, Michael</td>
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</table>
8.17.6.7
A liquidtight integrity test shall be performed on the protective clothing or ensemble in accordance with Section 8.2 after the chemical flash fire exposure.

8.17.6.7.1
Testing shall be performed with the suited manikin exposed to the liquid spray for a total of 4 minutes, 1 minute in each of the manikin orientations.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: City:
State: Zip:
Submittal Date: Tue Jul 19 14:52:23 EDT 2016

Committee Statement

Committee Statement: The proposed change is being made to recognize that a reduced level of integrity is acceptable for the ensemble after the simulated flash fire. This change is consistent with the practice employed in NFPA1991 for vapor protective ensembles.

Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
  0 Affirmative with Comments
  1 Negative with Comments
  0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Negative with Comment

Hirschey, Ryan C.

Without sufficient data available to substantiate a reduction in the exposure time of the liquidtight integrity test after the chemical flash fire test is performed, the currently established criteria per the 2012 edition of this standard should remain until sufficient data is available and proves the reduction does not present a safety hazard to end users.
8.18.1 Application.

This test method shall apply to protective garment materials, visor materials, glove materials, footwear upper materials, and hood materials, and interface gasket materials, if applicable. Test methods shall also apply to elastomeric interface materials in direct contact with the wearer’s skin and excludes interface materials where used between the hood and respirator.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Sat Jun 25 06:47:52 EDT 2016

Committee Statement

Committee Statement: 1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow “less-than-perfect” mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Hallo Fo. Fo. As.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
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Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Negative with Comment
Lovasic, Susan L.

HTP testing should be required for all elements that make up the garment. The visor has to pass HTP and has less chance of contacting the wearer’s skin than the elastomeric interface does. There is no guarantee that an elastomeric interface used in the garment hood will never contact the wearer’s skin in use. For safety, the elastomeric interface material should be required to be tested to the HTP requirement also.
8.19.1 Application.

This test method shall apply to garment materials, visor materials, glove materials, footwear upper materials, hood materials, and elastomeric interface gasket materials.

Committee Statement

Committee Statement:

1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia).

2. Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface.

3. Interface materials do not have to be made from elastomers.

4. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex.

5. The standard should address exposed interface materials. Seam tape is an interface material already addressed in the standard.

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
Affirmative All

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Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.19.4 Procedure.

Flame resistance testing shall be conducted in accordance with ASTM F1358, *Standard Test Method for Effects of Flame Impingement on Materials Used in Protective Clothing Not Designated Primarily for Flame Resistance*, with the following modifications:

- The test apparatus shall include the test cabinet and accessories, burner, gas regulation system, as specified in Sections 6.1, 6.2, and 6.3 of ASTM D6413, *Standard Test Method for Flame Resistance of Textiles (Vertical Test)*.

1. Each specimen shall only be exposed to the flame for a 12-second period.
2. Specimens shall be observed for the combination of both melting and dripping.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jul 06 12:05:10 EDT 2016

Committee Statement

Committee Statement: The proposed change aligns the test method apparatus and procedures with recently introduced changes in the referenced ASTM Test Method.

Response Message:

Ballot Results

✔ This item has passed ballot

- 30 Eligible Voters
- 4 Not Returned
- 26 Affirmative All
  - 0 Affirmative with Comments
  - 0 Negative with Comments
  - 0 Abstention

Not Returned

Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
8.20.6.3
The average total heat loss (Qt) of the sample shall be calculated and reported on the product label in the technical data package.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sun Dec 13 09:00:05 EST 2015

Committee Statement

Committee Statement: It is proposed that this information be provided in the manufacturer’s Technical Data Package along with other data demonstrating the compliance of the product to the standard. Instead of the THL value, recommendation is made that the words “Breathable (see manufacturer’s Technical Data Package)” be placed on the label.

Response Message:

Public Comment No. 51-NFPA 1992-2015 [Section No. 8.20.6.3]

Ballot Results

✅ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
The TC agreed to have "apparent intrinsic evaporative resistance" and "intrinsic thermal resistance" reported and both are also listed in the TDP requirements. 8.20.6.3 should be edited to add in reporting of "apparent intrinsic evaporative resistance" and "intrinsic thermal resistance" values.
Section 8.21 Overall Heat Transfer Performance Test

8.21.1 Application
This test method shall be applied to garments and ensembles.

8.21.2 Samples
Samples for conditioning shall be complete garment elements and ensembles except for the respirator.

8.21.2.1 Samples shall be conditioned as specified in 8.1.2.

8.21.3 Specimens
Specimens shall be the complete garments or ensembles specified in 8.21.2.1.

8.21.3.2 Three specimens shall be tested.

8.21.4 Procedure
Specimens shall be tested in accordance with ASTM F1930, Test Method for Evaluation of Flame Resistant Clothing for Protection Against Flash Fire Simulations Using an Instrumented Manikin, using an exposure heat flux of 84 kW/m² (2.02 cal/cm² -sec) with an exposure time of 4 seconds.

8.21.4.2 The manikin shall be dressed in 170 g/m² (5.0 oz/yd²) (± 5 percent), jersey knit, 100 percent cotton underwear briefs and short-sleeved crew-neck T-shirts before the garment specimen is placed on the manikin.

8.21.5 Report
The predicted percent body burn based on the total surface area covered by sensors, excluding hands and feet, for each specimen shall be reported.

8.21.5.2 The average predicted body burn rating of all specimens shall be calculated and reported.

8.21.6 Interpretation
The average predicted body burn rating shall be used to determine pass/fail performance for suit element materials.
Committee Statement

Committee Statement: Additional research is needed to properly apply an instrumented manikin test for the evaluation of full body protective garments and ensembles for the measurement of predicted burn injury given configurational challenges of putting samples onto test manikins.

Response Message:

Ballot Results

✅ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
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Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
 исполняется применительно к эластомерным уплотнительным материалам.

**Submitter Information Verification**

**Submitter Full Name:** Thomas McGowan  
**Organization:** National Fire Protection Assoc  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sat Jun 25 06:50:28 EDT 2016

**Committee Statement**

1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia).

Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface.  

2. Interface materials do not have to be made from elastomers.  

3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex.  

4. The standard should address exposed interface materials.  

5. Seam tape is an interface material already addressed in the standard.

**Response Message:**

**Ballot Results**

- **This item has passed ballot**
  
- 30 Eligible Voters
- 4 Not Returned
- 26 Affirmative All
  
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

**Not Returned**

- Buck, Ted S.
- Greene, Russell R.
- North, John W.
- Thompson, Donald B.
<table>
<thead>
<tr>
<th>Name</th>
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<td>Ziskin, Michael</td>
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</table>
8.21.2.1
Samples for conditioning shall be pieces of the same size as the test specimens taken from either elastomeric interface gasket sheet material or individual formed interface gaskets interfaces that are representative of the interface material nominal thickness.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Sat Jun 25 06:51:17 EDT 2016

Committee Statement

Committee Statement:
1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

✓ This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

**Affirmative All**
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
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Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

**Affirmative with Comment**
Lovasic, Susan L.

Missing text "and composition". Not just thickness should be listed. See Section 8.4.14 for full and complete wording. This correction is also needed for sections 8.12.9.1.
Second Revision No. 104-NFPA 1992-2016 [New Section after 8.22.5.2]

8.21.5.3
The average elongation at rupture before and after heat aging shall be individually used to qualify the elastomeric character of the interface material.

Submitter Information Verification
Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jun 25 06:53:29 EDT 2016

Committee Statement
Committee Statement: 1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers. 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

✓ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
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Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Second Revision No. 105-NFPA 1992-2016 [ Section No. 8.22.6 ]

8.21.6 Interpretation.

8.21.6.1
The average ultimate tensile strength both before and after heat aging shall be individually used to determine pass/fail performance.

8.21.6.2
An elongation at rupture of less than 125 percent shall qualify an interface material for consideration as a garment material.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Sat Jun 25 06:54:28 EDT 2016

Committee Statement

Committee Statement: 1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow “less-than-perfect” mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface. 2. Interface materials do not have to be made from elastomers 3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex. 4. The standard should address exposed interface materials. 5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

☑ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
<table>
<thead>
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<th>Affirmative All</th>
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<td>Zeigler, James P.</td>
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<td>Ziskin, Michael</td>
</tr>
</tbody>
</table>
8.22 Impact and Compression Test.

8.22.1 Application.
This test method shall apply to the toe section of the footwear.

8.22.2 Samples.

8.22.2.1 Samples shall be complete footwear toes.

8.22.2.2 Samples shall be conditioned as specified in 8.1.2.

8.22.3 Specimens.

8.22.3.1 Specimens shall be the size specified in Sections 5 and 6 of ASTM F2412, Standard Test Methods for Foot Protection.

8.22.3.2 At least three specimens shall be tested for both impact and compression.

8.22.4 Procedure.
Footwear specimens shall be tested in accordance with Sections 5 and 6 of ASTM F2412, Standard Test Methods for Foot Protection.

8.22.5 Report.
The impact and compression forces for each specimen shall be recorded and reported.

8.22.6 Interpretation.
One or more footwear specimens failing this test shall constitute failing performance.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 23 14:04:20 EDT 2016

Committee Statement

Committee Statement: While the Technical Committee agrees with the submitter that a larger number of footwear options should be afforded to first responders when the ensemble includes booties that already meet the liquid chemical penetration resistance requirements of the standard as well as other properties established for garment materials, it has proposed alternative language to permit the use of other certified footwear and modified the requirements in the testing to make it easier for manufacturers to specify a larger range of footwear as part of ensembles. Additional correlating items regarding the performance requirements for ASTM F2412 have also been addressed.
Ballot Results

This item has passed ballot

- 30 Eligible Voters
- 4 Not Returned
- 26 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
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Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

8.23 Evaporative Resistance Test

8.23.1 Application.
This test method shall apply to the suit based composite designated as breathable.

8.23.2 Samples.

8.23.2.1 Samples shall be conditioned at a temperature of 25°C, ±7°C (77°F, ±13°F) and a relative humidity of 65 percent, ±5 percent for at least 4 hours.

8.23.2.2 The minimum sample size shall be 51 cm × 51 cm (20 in. × 20 in.).

8.23.3 Specimens.

8.23.3.1 Specimen size shall be the size required to cover the sweating guarded hot plate.

8.23.3.2 Evaporative resistance testing shall be conducted on at least three specimens.

8.23.3.3 Specimens shall consist of all layers in the protective garment composite, arranged in the order and orientation as worn and shall not include any reinforcement materials.

8.23.4 Apparatus.

8.23.4.1 The test apparatus shall be as specified in ISO 11092, Textiles — Physiological effects — Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test).

8.23.4.2 The dimensions for the sweating guarded hot plate shall be a 25.4 cm (10 in.) test plate with a 12.7 cm (5 in.) guard surrounding the test plate.

8.23.5 Procedure.

Testing shall be conducted in accordance with ISO 11092, Textiles — Physiological effects — Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test), with the following modifications:

1. The specimen shall be placed on the test plate with the side normally facing the human body toward the test plate.

2. For multiple layers the layers shall be arranged in the order and orientation as worn.

3. Each layer shall be smoothed by hand to eliminate wrinkles or bubbles in each layer and, if necessary, secure the edges.

4. Once the test is started, no further adjustments to the specimen shall be made.

8.23.6 Report.

8.23.6.1 The total evaporative resistance \( R_{et} \) of each sample shall be recorded and reported.
8.23.6.2
The average total evaporative resistance \( R_{et} \) of all tested samples shall be recorded and reported in the technical data package.

8.23.7 Interpretation.

8.23.7.1
Pass or fail determination shall be based on the average reported total evaporative resistance \( R_{et} \) measurement of all specimens tested.

8.23.7.2
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.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Fri Dec 11 21:43:48 EST 2015

Committee Statement

Committee Statement: The measurement of Ret actually differs from the measurement of the apparent evaporative resistance is determined in evaluation of total heat loss (THL). The primary difference is that Ret is measured isothermally whereas apparent evaporative resistance for THL is measured with an environment to plate temperature difference of 10°C. The proposed change provides a new test method for the measurement of Ret.

Response Message:

Public Comment No. 50-NFPA 1992-2015 [New Section after 8.24]

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
23 Affirmative All
2 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.
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Mann, Philip C.
Rogers, Paul G.
Shelton, Robert E.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Nystrom, Ulf
Delete 8.23.7. There is no requirement (pass/fail).
Stull, Jeffrey O.
Paragraph 8.23.7.1 is not needed because the requirement is report only.

Negative with Comment
Lovasic, Susan L.
8.23.7.1 states "Pass or fail determination shall be based on the average reported total evaporative resistance (Ret) measurement of all specimens tested." But there are no pass/fail criteria for any of the optional "breathability" tests. Therefore, delete section 8.23.7.1.
Second Revision No. 106-NFPA 1992-2016 [Section No. A.3.3.36]

A.3.3.35 Interface Gasket.

Examples of interface gaskets may include garment hood to respirator facepiece, garment sleeve to glove, and garment leg to boot. These gaskets have unique properties that might necessitate different performance requirements.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jun 25 06:56:26 EDT 2016

Committee Statement

Committee Statement:

1. A gasket is a mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets allow "less-than-perfect" mating surfaces on machine parts where they can fill irregularities. (Wikipedia). Not all interfaces involve a material between two other materials. And the phrase interface gasket is redundant in that a gasket lies within an interface.

2. Interface materials do not have to be made from elastomers.

3. The appendix item and the content of the standard also include the interface between the garment and the respirator, when applicable, even though the respirator is not a component or element of compliant ensemble. That distinction should not be buried in the annex.

4. The standard should address exposed interface materials.

5. Seam tape is an interface material already addressed in the standard.

Response Message:

Ballot Results

This item has passed ballot

30 Eligible Voters
4 Not Returned
25 Affirmative All
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Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael

Affirmative with Comment
Stull, Jeffrey O.
This information should be appended to the definition of elastomeric interface material.
A.5.3.4
Manufacturers should determine the size range of their ensembles by matching human dimensions with available suit sizes. These determinations should account for other clothing and equipment to be worn by the wearer as recommended by the manufacturer. Assessment of acceptable fit should be determined by using ASTM F1154, Standard Practices for Qualitatively Evaluating the Comfort, Fit, Function, and Integrity Durability of Chemical Protective Suit Ensembles and Ensemble Components.

Submitter Information Verification
Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 29 07:32:38 EDT 2016

Committee Statement
Committee Statement: update source title.
Response Message:

Ballot Results
This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
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Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
A.6.1.6

Total heat loss (THL) measures the heat transmitted or lost through a material or composite under a set of standard conditions specified by NFPA. The THL test measures and combines the heat that flows through a material or composite by conduction and evaporation. Table A.6.1.6 gives THL values for garment systems for which NFPA has set minimum performance requirements, to provide a frame of reference for the THL value reported on the label of the suit. Materials or composites with THL values below 200 W/m$^2$ have limited breathability and very limited ability to reduce heat stress. A manufacturer might designate a suit to be "breathable" by making marketing claims of breathability, heat stress relief, or comfort, for example. The AHJ has the ultimate responsibility to determine the level of suit breathability appropriate for anticipated environmental conditions based on a needs assessment. Evaporative resistance also provides a measure of garment breathability, but under different conditions, and is intended to be complementary to THL test results to permit the AHJ to consider other factors in their selection of protective garments.

Table A.6.1.6 NFPA Minimum Performance Requirements for Garment Systems

<table>
<thead>
<tr>
<th>Clothing Type</th>
<th>W/m$^2$</th>
<th>Range of THL Values of Products Currently Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural fire-fighting clothing</td>
<td>205</td>
<td>205–330</td>
</tr>
<tr>
<td>Rescue and recovery tech rescue gear</td>
<td>450</td>
<td>450–550</td>
</tr>
<tr>
<td>EMS clothing</td>
<td>450</td>
<td>450–700</td>
</tr>
<tr>
<td>Wildlands clothing</td>
<td>450</td>
<td>550–700</td>
</tr>
<tr>
<td>NFPA 1994 Class 3</td>
<td>200</td>
<td>200–450</td>
</tr>
<tr>
<td>NFPA 1994 Class 4</td>
<td>450</td>
<td>Not currently available 450–700</td>
</tr>
</tbody>
</table>

Submitter Information Verification

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Submittal Date: Thu Jun 23 19:36:51 EDT 2016

Committee Statement

Committee Statement: added THL value
Response Message:

Ballot Results

✓ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All

221 of 230 9/28/2016 12:09 PM
Affirmative with Comments
Negative with Comments
Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
Harkness, A. Ira
Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Liquid penetration resistance testing assesses whether liquids will pass through a material or seam under specified conditions of exposure. Chemicals will penetrate materials and seams because either the chemical has low surface tension that allows the liquid chemical to seep through holes or pores in the material or seam, or due to degradation of the chemical interacting with the material that can cause deterioration of the material to the extent that creates physical penetration pathways for liquid passage.

The chemicals for chemical penetration resistance testing are chosen from ASTM F1001, *Standard Guide for Selection of Chemicals to Evaluate Protective Clothing Materials*, and other relevant chemicals according to the following factors:

1. Chemicals were included from the ASTM F1001 list if the chemical was a low-volatility liquid with a vapor pressure less than 5 mm Hg at 20°C.

2. Liquid chemicals from the ASTM F1001 list that have vapor pressures above 5 mm Hg at 20°C but do not have a skin notation and are not classified as a human carcinogen according to ACGIH’s *Threshold Limit Values For Chemical Substances and Physical Agents and Biological Exposure Indices* or the *NIOSH Pocket Guide to Chemical Hazards*.

3. Substitute chemicals were chosen for relatively volatile chemicals that were of the same general chemical classification but with a lower vapor pressure than the comparable ASTM F1001 liquid chemical that also did not have a skin notation as indicated in A.8.4.4.1(2). These substitutions include methyl isobutyl ketone for acetone and butyl acetate for ethyl acetate. Less volatile chemicals are easier to observe if the chemical penetrates the material.

4. Some chemicals were chosen on the basis of their known degradation effects on a wide range of elastomeric and polymeric materials used in various forms of protective clothing.

5. Fuel C, a mixture of equal volumes of toluene and H, a mixture of 42.5 percent toluene, 42.5 percent isooctane, and 15 percent ethanol, v/v, was chosen to represent a broad range of hydrocarbons and is a surrogate for gasoline.

6. Sodium hypochlorite was chosen as a chemical representative of harsh disinfectant that can cause degradation of different clothing materials that could lead to liquid penetration of materials or seams.

7. Nitric acid was chosen to represent a different type of corrosive inorganic acid.

8. Isopropanol, while having a relatively high vapor pressure, was selected on the basis of its low surface tension.

Table A.8.4.4.1 summarizes important characteristics and reasoning for the selection of the chemicals.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Percentage</th>
<th>Vapor Pressure (mm Hg)</th>
<th>Skin Notation</th>
<th>Surface Tension (dynes/cm)</th>
<th>Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butyl acetate</td>
<td>&gt;95%</td>
<td>12</td>
<td>No</td>
<td>25</td>
<td>Known degradation effects on polymers; substituted for ethyl acetone (ASTM F1001) due to lower vapor pressure</td>
</tr>
<tr>
<td>Dimethyl formamide</td>
<td>&gt;95%</td>
<td>3</td>
<td>Yes</td>
<td>36</td>
<td>ASTM F1001 chemical; known degradation effects on polymers (including nitriles, PVC, and others)</td>
</tr>
<tr>
<td>Fuel C (toluene/isooctane)</td>
<td>42.5% toluene, 42.5% isooctane, and 15% ethanol, v/v</td>
<td>30 32 *</td>
<td>No</td>
<td>25 24</td>
<td>Surrogate for gasoline; provides a representative hydrocarbon mixture; mixture standardized in ASTM D471</td>
</tr>
<tr>
<td>Isopropanol</td>
<td>91%</td>
<td>45</td>
<td>No</td>
<td>22</td>
<td>Low surface tension</td>
</tr>
<tr>
<td>Chemical</td>
<td>Percentage</td>
<td>Vapor Pressure (mm Hg)</td>
<td>Skin Notation</td>
<td>Surface Tension (dynes/cm)</td>
<td>Reasoning</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------</td>
<td>------------------------</td>
<td>---------------</td>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Methyl isobutyl ketone (MIBK)</td>
<td>&gt;95%</td>
<td>20</td>
<td>No</td>
<td>24</td>
<td>Low surface tension; known degradation effect on polymers; substituted for acetone (ASTM F1001) due to lower vapor pressure\ ASTM F1001 chemical; low surface tension; represents nitrogen containing organics; known degradation effects on multiple polymers</td>
</tr>
<tr>
<td>Nitrobenzene</td>
<td>&gt;95%</td>
<td>0.25</td>
<td>Yes</td>
<td>43</td>
<td>ASTM F1001 chemical; low surface tension; represents nitrogen containing organics; known degradation effects on multiple polymers</td>
</tr>
<tr>
<td>Sodium hydroxide</td>
<td>50%</td>
<td>&lt;0.1</td>
<td>No</td>
<td>103</td>
<td>ASTM F1001 chemical; highly caustic chemical; frequency of exposure</td>
</tr>
<tr>
<td>Sodium hypochlorite</td>
<td>10%, made within 72 hours of use</td>
<td>21</td>
<td>No</td>
<td>72</td>
<td>Known degradation effect on polymers; frequency of use as decontamination agent</td>
</tr>
<tr>
<td>Sulfuric acid</td>
<td>93.1%</td>
<td>&lt;0.3</td>
<td>No</td>
<td>55</td>
<td>ASM F1001 chemical; known degradation effects on polymers; frequency of exposure</td>
</tr>
<tr>
<td>Tetrachloroethylene</td>
<td>&gt;95%</td>
<td>14</td>
<td>No</td>
<td>32</td>
<td>ASTM F1001 chemical; known degradation effects on polymers; represents halogenated hydrocarbons</td>
</tr>
</tbody>
</table>

Submitter Information Verification

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Submittal Date: Fri Dec 11 21:57:50 EST 2015

Committee Statement

Committee Statement: Correct chemical name and Cap letter editorial.
Response Message:
Public Comment No. 49-NFPA 1992-2015 [Section No. A.8.4.4.1]

Ballot Results

✔ This item has passed ballot

30 Eligible Voters
4 Not Returned
26 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Buck, Ted S.
Greene, Russell R.
North, John W.
Thompson, Donald B.

Affirmative All
Allen, Jason L.
Clifford, Brian J.
Corrado, Steven D.
Daly, Jr., Richard P.
Del Re, Nicholas
Fithian, William A.
Green, Dustin
Haines, Todd W.
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Haskell, III, William E.
Hirschey, Ryan C.
Kerbow, Kyle
Kienzle, Michael P.
Kirsteins, Andra
Lancaster, Beth C.
Lehtonen, Karen E.
Lovasic, Susan L.
Mann, Philip C.
Nystrom, Ulf
Rogers, Paul G.
Shelton, Robert E.
Stull, Jeffrey O.
West, Robert
Wisner, Jr., John E.
Zeigler, James P.
Ziskin, Michael
Annex B  Informational References

B.1  Referenced Publications.

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

B.1.1  NFPA Publications.

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


B.1.2  Other Publications.

B.1.2.1  ASTM Publications.

American Society for Testing and Materials, 100 Barr Harbor Drive, P.O Box C700, West Conshohocken, PA 19428-2959.


B.1.2.2  ISO Publications.

International Organization for Standardization, 1, rue de Varembé, Case postale 56, Geneva 20, ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland.

ISO Guide 27, Guidelines for corrective action to be taken by a certification body in the event of misuse of its mark of conformity, 1983.


ISO 9001, Quality management systems — Requirements, 2008.

ISO 9001, Quality management systems — Requirements, 2015.

B.1.2.3  U.S. Government Publications.


Title 42, Code of Federal Regulations, Part 84, Subpart E, §84.41, “Quality Control Plans; Contents.”
B.1.2.4 Other Publications.

American Conference of Governmental Industrial Hygienists (ACGIH), *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, 2014.


B.2 Informational References. (Reserved)

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


B.3 References for Extracts in Informational Sections. (Reserved)

---

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Submittal Date: Wed Jun 29 07:38:23 EDT 2016

**Committee Statement**

Committee Statement: updating source reference titles and dates.  
Response Message:

**Ballot Results**

☑️ This item has passed ballot

30 Eligible Voters  
4 Not Returned  
26 Affirmative All  
0 Affirmative with Comments  
0 Negative with Comments  
0 Abstention

**Not Returned**  
Buck, Ted S.  
Greene, Russell R.  
North, John W.  
Thompson, Donald B.

**Affirmative All**  
Allen, Jason L.  
Clifford, Brian J.