Tentative Interim Amendment

NFPA 1951

Standard on Protective Ensembles for Technical Rescue Incidents

2007 Edition

Reference: 8.45
TIA 07-2
(SC 07-10-13/TIA Log #894)

Pursuant to Section 5 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 1951, *Standard on Protective Ensembles for Technical Rescue Incidents*, 2007 edition. The TIA was processed by the Technical Committee on Special Operations Protective Clothing and Equipment, and was issued by the Standards Council on October 4, 2007, with an effective date of October 24, 2007.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a proposal of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Revise 8.45.4, Procedures, of Section 8.45 Chemical Permeation Resistance Test to read:

8.45.4.1 Specimens shall be tested for permeation resistance for not less than 60 minutes against the chemicals specified in 8.45.4.2, 8.45.4.3, and 8.45.4.4 in accordance with ASTM F 739, *Standard Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids or Gases Under Conditions of Continuous Contact*, with the following modifications:

(1) The test cells shall be designed to accommodate the introduction of liquid chemicals in a safe manner.
(2) Testing shall be conducted in an open-loop configuration for the collection of permeant.
(3) The collection media shall be filtered air flowed through the bottom of the test cell at a rate of 1 lpm, ±0.1 lpm with a relative humidity of 80 percent, ±5 percent.
(4) Analytical methods used shall be sensitive to concentrations of at least one order of magnitude lower than the required end points.
(5) Where cumulative permeation end points are not specified in this standard, a permeation rate of 0.1 $\mu g/cm^2$/minute, as defined by ASTM F 739, *Standard Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids or Gases Under Conditions of Continuous Contact*, shall be used.

8.45.4.2* The following non-volatile liquid chemicals shall be tested:

(1) Chemical warfare agents
  (a) Distilled sulfur mustard [HD; bis (2-chloroethyl) sulfide], 505-60-2; at 32°C, ±1°C (90°F, ±2°F)
  (b) Soman (GD; o-pinacolyl methylphosphonofluoridate), 96-64-0; at 32°C, ±1°C (90°F, ±2°F)
(2) Toxic industrial chemical
  (a) Dimethyl sulfate (DMS, sulfuric acid dimethyl ester), 77-78-1; at 32°C, ±1°C (90°F, ±2°F)

8.45.4.3* The following volatile liquid chemicals shall be tested:

(1) Acrolein (allyl aldehyde), 107-02-8; at 32°C, ±1°C (90°F, ±2°F)

(2) Acrylonitrile (VCN, cyanoethylene), 107-13-1; at 32°C, ±1°C (90°F, ±2°F)

8.45.4.4 The following gases shall be tested:
(1) Ammonia (NH_3, 7664-41-7); at 32°C, ±1°C (90°F, ±2°F)
(2) Chlorine (Cl_2, 7782-50-5); at 32°C, ±1°C (90°F, ±2°F)

8.45.4.5 Permeation Test Configuration.

8.45.4.5.1 For permeation tests the concentration for gases and volatile liquid chemicals shall be 40 ppm, +5/-0 ppm.

8.45.4.5.2 For permeation tests the concentration density for non-volatile liquid chemicals shall be 10 g/m^2, +1/-0 g/m^2, and the cell shall be assembled in closed-top configuration. The liquid drops shall be uniformly distributed over the test area of the sample surface, applied as nominal 1 µl drops. Where a seam, closure, or fixture is included, at least one drop shall be applied to each critical juncture, such as the seam edge.

8.45.4.5.3 For non-volatile liquid chemicals, the test cell shall be assembled in the open-top configuration with 0.3 lpm, ±0.03 lpm of filtered air with a relative humidity of 80 percent, ±5 percent flowing through the top of the cell. With the open-top configuration, the test cell washer shall be allowed to be sealed by an impermeable nonreactive sealant.

2. Add new annex paragraphs:

A.8.45.4.2 Liquid chemicals are classified as non-volatile when their vapor-pressure at room temperature (20-25°C) is 5 mm Hg or less. This distinction between volatile and non-volatile is established in NFPA 1992, *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials*, for specifying liquid chemical hazards. Upon release, volatile liquids quickly evaporate and the principal exposure to first responders is the chemical in a vapor form. This distinction is used for determining how protective clothing materials are tested for permeation resistance against liquid chemicals.

A.8.45.4.3 (see A.8.45.4.2)

3. Modifications to TIA Language.
Editorial Note: The following edits to 8.45.6, which was revised by TIA 07-1, are necessary to conform with this TIA.

8.45.6 Interpretation. For permeation testing of chemical warfare agents specified in 8.45.4.2(1) and liquid and gaseous industrial chemicals specified in 8.45.4.2(2), 8.45.4.3, and 8.45.4.4 the average cumulative permeation shall be used to determine pass or fail performance.

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