

NFPA 1950-2025 Edition

Standard on Personal Protective Equipment for Technical Rescue Incidents, Emergency Medical Operations, and Wildland and Urban Interface Firefighting

TIA Log No.: 1819

Reference: 15.1.2.1.5(new), 15.1.2.1.6(new), 16.1.7.3(new), A.16.1.7.3(new), 16.2.11(new), 17.1.15(new), 18.10(new), and 19.37(new)

Comment Closing Date: April 16, 2025

Submitter: Neil McMillan, International Association of Fire Fighters

www.nfpa.org/1950

1. Add new paragraphs 15.1.2.1.5 and 15.1.2.1.6 to read as follows:

15.1.2.1.5 Chapters 15 through 19 of this standard shall also provide requirements and tests to verify the levels of restricted substances used in garment fabrics.

15.1.2.1.6 Chapters 15 through 19 of this standard shall also provide optional PFAS content labeling where the manufacturer or authority having jurisdiction specifies the use of non-PFAS textiles for the construction of protective garments, or where the manufacturer represents protective garment materials as being non-PFAS.

2. Add new paragraphs 16.1.7.3, A.16.1.7.3, 16.2.11 to read as follows:

16.1.7.3* Manufacturers shall be permitted to include the following statement as part of their product label where the required evidence for indicating PFAS levels in the garment is provided as specified in 6.5.11:

**THIS GARMENT UPON CERTIFICATION HAS A PFAS (TOTAL FLUORINE)
CONCENTRATION OF NO MORE THAN 100 PPM.**

A.16.1.7.3 There is currently no standardized or technically practical way to fully determine the exact amount of all PFAS chemicals that might be present in a protective element. However, there are accepted industry practices for measuring the total fluorine in a given material or component that have been used for representing the total PFAS that might be present. The current techniques for measuring total fluorine will report fluorine levels that potentially include fluorine from both organic fluorine chemicals as well as inorganic fluorine chemicals that are not considered PFAS.

It is further recognized that while manufacturers or their suppliers might not intentionally add or believe PFAS has been added to a specific material or component, PFAS might still be present at measurable levels in the tens to hundreds of parts per million based on contaminated raw materials, fabrication processes, or various ways of handling materials. Some regulatory bodies have established limits for PFAS that account for some level of measurable total fluorine or total organic fluorine. A method for total organic fluorine had not been standardized at the time this standard was completed. Nonetheless, the prevailing limit for total fluorine in products has been established as 100 ppm for textile-based products in the following publications: *California Safer Clothes and Textiles Act* (AB 1817), the 2024 edition of OEKO-TEX Standard 100, and the 2024 edition of the AFIRM Restricted Substances List. Consequently, the limit of 100 ppm of total fluorine has become an acceptable practice for distinguishing between products that have “intentionally added” PFAS and those that do not.

Manufacturers choosing to apply this language as part of their label are encouraged to provide supplemental information as part of their user information that helps explain the specific total fluorine measurements that apply to their certified protective elements.

16.2.11* If the manufacturer makes the claim permitted in 16.1.7.3, then the claim shall be based on test results when their protective elements are evaluated as specified in 19.37.2, Test for Total Fluorine. (See A.16.1.7.3.)

16.2.11.1 If the manufacturer makes the claim permitted in 16.1.7.3, then the manufacturer

shall make the report specified in 19.37.2.6.3 available to the authority having jurisdiction upon request. (See A.16.1.7.3.)

3. *Add new paragraph 17.1.15 to read as follows:*

17.1.15 Garment textile fabrics, including particulate-blocking layers but excluding interlinings, shall be recognized components that meet levels of restricted substances as specified in Section 18.10, Acceptable Levels of Restricted Substances in Specified Protective Element Recognized Components.

17.1.15.1 Visibility markings and findings, including thread, labels, emblems, collar stays, elastic and hook-and-pile fasteners, buttons, and other closure hardware, shall be excluded from the testing specified in 17.1.15.

4. *Add a new section 18.10 to read as follows:*

18.10* Acceptable Levels of Restricted Substances in Specified Protective Element Recognized Components. Components that are required to be certified for specific individual protective elements or items shall meet the acceptable restricted substances as established in Table 18.10(a) when tested as specified in 9.37.1, Test Method for Acceptable Levels of Specific Restricted Substances, subject to the following applications or exceptions:

(1) Testing for acetophenone and 2-Phenyl-2-propanol shall only be applied to polymers that contain ethylene vinyl acetate.

(2) Testing for acidic or alkaline substances (pH) shall be excluded for materials and components that are plastics, rubber, or polymers.

(3) Testing for azo-amines and aryl amine salts shall be excluded for materials and components that are plastics, rubber, or polymers.

(4) Testing for bisphenols shall only be applied to materials and components that are plastics, rubber, or polymers, including elastomers.

(5) Testing for chlorobenzenes and chlorotoluenes shall only be applied to materials and components that include synthetic fibers, natural and synthetic fiber blends, or artificial leather.

(6) A maximum level of 30 mg/kg of 1,2-Dichlorobenzene shall be permitted when C.I. Pigment Violet 23 (CAS No. 6358-30-1), Yellow 93 (CAS No. 5580-57-4), Orange 61 (CAS No. 40716-47), and Red 214 (CAS No. 82643-43-4) solution-dyed fibers are used.

(7) Testing for chlorinated paraffins shall be excluded for materials that include natural or synthetic fibers.

(8) Testing for chlorophenols shall be only applied to materials and components that include natural fibers, synthetic fibers, or natural and synthetic fiber blends.

(9) Testing for dyes shall only be applied to materials and components that include synthetic fibers or natural and synthetic fiber blends.

(10) Testing for formaldehyde shall be excluded for materials and components that are plastics or polymers.

(11) Testing for heavy metal Chromium VI shall be only applied to materials and components that consist of natural fibers or synthetic fibers.

(12) Testing for total heavy metal content that includes arsenic, cadmium, lead, and mercury shall be excluded for materials and components that include synthetic fibers.

(13) Testing for monomers shall be only applied to materials and components that include artificial leather or are plastics, rubber, and polymers.

(14) Testing for nitrosamines shall be only applied to materials and components that are rubber.

(15) Testing for ortho-phenylphenol shall be excluded for materials and components that are plastics, rubber, or polymers.

(16) Testing for phthalates shall be excluded for materials and components that include

- natural fibers, synthetic fibers, and natural and synthetic fiber blends.
- (17) Testing for polycyclic aromatic hydrocarbons shall be excluded for materials and components that include natural fibers, synthetic fibers, and natural and synthetic fiber blends.
- (18) Testing for quinoline shall be applied to materials and components that include synthetic fibers or natural and synthetic fiber blends.
- (19) Testing for solvent residuals shall be applied to materials and components that include synthetic coated fabrics or artificial leather or that are polyurethane-based plastics or polymers.
- (20) A maximum level of 1000 mg/kg for Dimethylacetamide (DMAC), Dimethylformamide (DMF), and N-Methyl-2-pyrrolidone (NMP) shall be permitted for materials made of acrylic, elastane, polyurethane, polyimide, aramids, and coated textiles.
- (21) A maximum level of 3.0 weight percent for Dimethylacetamide (DMAC), Dimethylformamide (DMF), and N-Methyl-2-pyrrolidone (NMP) shall be permitted for material products that must undergo further industrial production stages, such as fibers that are spun with the aid of DMAC, DMF, or NMP.
- (22) Testing for UV stabilizers shall be applied to materials and components that include plastics, rubber, or polymers.
- (23) Testing for volatile organic compounds shall be applied to materials and components that include artificial leather or are polyurethane-based plastics or polymers.
- (24) Perfluorinated and polyfluorinated alkyl substances shall be tested in relevant materials and components for both total PFAS and individual PFAS chemicals.

Table 18.10(a) Acceptable Levels of Restricted Substances in Specified Protective Element Recognized Components

<u>Chemical Class or Group</u>	<u>Restricted Substance(s)</u>	<u>Maximum Level</u>
<u>Acetophenone and 2-Phenyl-2-propanol</u>	<u>Acetophenone and 2-Phenyl-2-propanol</u>	<u>10 mg/kg</u>
<u>Acidity and alkaline substances</u>	<u>Measured by reporting pH</u>	<u>Acceptable range</u>
-	-	<u>4.0–7.5</u>
<u>Alkyl phenols and ethoxylates</u>	<u>Sum of 4-tert butylphenol, nonylphenol, octylphenol, heptaphenol, and pentylphenol</u>	<u>10.0 mg/kg</u>
-	<u>Sum of 4-tert butylphenol, nonylphenol, octylphenol, heptaphenol, pentylphenol, nonylphenolethoxylates, and octylphenol-ethoxylates</u>	<u>100.0 mg/kg</u>
<u>Azo-amines and aryl amine salts</u>	<u>Each individual substance in Table 18.10(b)</u>	<u>20 mg/kg</u>
<u>Bisphenols</u>	<u>Bisphenol A, Bisphenol B, and Bisphenol S, each</u>	<u>1000 mg/kg</u>
<u>Chlorinated benzenes and toluenes</u>	<u>Sum of all chemicals in Table 18.10(c) except Chlorobenzene as indicated below and in Note A</u>	<u>1.0 mg/kg</u>
	<u>Chlorobenzene</u>	<u>30 mg/kg^a</u>
<u>Chlorinated paraffins</u>	<u>Short-chain chlorinated paraffins (SCCPs) (C10-C13)</u>	<u>1000 mg/kg</u>
	<u>Short-chain chlorinated paraffins (SCCPs) (C10-C13)</u>	<u>1000 mg/kg</u>
<u>Chlorinated phenols</u>	<u>Pentachlorophenol</u>	<u>0.5 mg/kg</u>
-	<u>Tetrachlorophenols</u>	<u>0.5 mg/kg</u>
-	<u>Trichlorophenols</u>	<u>2.0 mg/kg</u>
-	<u>Dichlorophenols</u>	<u>3.0 mg/kg</u>

<u>Chemical Class or Group</u>	<u>Restricted Substance(s)</u>	<u>Maximum Level</u>
-	<u>Monochlorophenols</u>	<u>3.0 mg/kg</u>
<u>Dyes</u>	<u>Each individual substance in Table 18.10(d)</u>	<u>50 mg/kg</u>
-	<u>Navy blue</u>	<u>Not present</u>
<u>Flame retardants</u>	<u>Each individual substance in Table 18.10(e)</u>	<u>10 mg/kg</u>
-	<u>Sum of all chemicals in Table 18.10(e)</u>	<u>50 mg/kg</u>
<u>Formaldehyde</u>	<u>Free and partially releasable</u>	<u>75 mg/kg</u>
<u>Heavy metals, extractable</u>	<u>Antimony</u>	<u>30.0 mg/kg</u>
-	<u>Arsenic</u>	<u>1.0 mg/kg</u>
-	<u>Barium</u>	<u>1000 mg/kg</u>
-	<u>Cadmium</u>	<u>0.1 mg/kg</u>
-	<u>Chromium</u>	<u>2.0 mg/kg</u>
-	<u>Chromium VI</u>	<u>0.5 mg/kg</u>
-	<u>Cobalt</u>	<u>4.0 mg/kg</u>
-	<u>Copper</u>	<u>50.0 mg/kg</u>
-	<u>Lead</u>	<u>1.0 mg/kg</u>
-	<u>Mercury</u>	<u>0.02 mg/kg</u>
-	<u>Nickel</u>	<u>4.0 mg/kg</u>
-	<u>Selenium</u>	<u>100 mg/kg</u>
<u>Heavy metals, total content</u>	<u>Arsenic</u>	<u>100 mg/kg</u>
-	<u>Cadmium</u>	<u>40.0 mg/kg</u>
-	<u>Lead</u>	<u>90.0 mg/kg</u>
-	<u>Mercury</u>	<u>0.5 mg/kg</u>
<u>Monomers</u>	<u>Styrene</u>	<u>0.005 mg/m³</u>
-	<u>Vinyl chloride</u>	<u>0.002 mg/m³</u>
<u>Nitrosamines</u>	<u>Each individual substance in Table 18.10(f)</u>	<u>0.5 mg/kg</u>
-	<u>Sum of N-nitrosatable substances</u>	<u>5 mg/kg</u>
<u>Organotin compounds</u>	<u>Tributyltin (TBT)</u>	<u>1.0 mg/kg</u>
-	<u>Triphenyltin (TPHT)</u>	<u>1.0 mg/kg</u>
-	<u>Each individual substance in Table 18.10(g)</u>	<u>2.0 mg/kg</u>
<u>Ortho-phenylphenol</u>	<u>Ortho-phenylphenol</u>	<u>25 mg/kg</u>
<u>Perfluorinated and polyfluorinated alkyl substances (PFAS)</u>	<u>Total fluorine content [includes non-PFAS]</u>	<u>Report</u>
	<u>Sum of C9-C14 PFCA-related substances</u>	<u>260 µg/kg</u>
	<u>Sum of PFOS, PFOSA, PFOSF, N-Me-FOSA, N-Et-FOSA, N-Me-FOSE, N-Et-FOSE</u>	<u>1 µg/m²</u>
	<u>Each and sum of PFHpA, PFNA, PFDA, PFUdA, PFDoA, PFTrDA, PFTeDA and further perfluorinated carboxylic acids in Table 18.10(j)</u>	<u>25 µg/kg</u>
	<u>Sum of perfluorinated sulfonic acids in Table 18.10(j)</u>	<u>250 µg/kg</u>
	<u>Each partially fluorinated carboxylic/sulfonic acids in Table 18.10(j)</u>	<u>250 µg/kg</u>
	<u>Sum of partially fluorinated linear alcohols in Table 18.10(j)</u>	<u>250 µg/kg</u>
	<u>Sum of esters of fluorinated alcohols with acrylic acid in Table 18.10(j)</u>	<u>250 µg/kg</u>

<u>Chemical Class or Group</u>	<u>Restricted Substance(s)</u>	<u>Maximum Level</u>
	<u>Sum of PFOA and salts</u>	<u>25 µg/kg</u>
	<u>Sum of PFOA-related substances</u>	<u>250 µg/kg</u>
<u>Phthalates</u>	<u>Sum of substances listed in Table 18.10(h)</u>	<u>500 mg/kg</u>
<u>Polycyclic aromatic hydrocarbons (PAH)</u>	<u>Benzo(a)pyrene</u>	<u>1.0 mg/kg</u>
-	<u>Benzo(e)pyrene</u>	<u>1.0 mg/kg</u>
-	<u>Benzo(a)anthracene</u>	<u>1.0 mg/kg</u>
-	<u>Chrysene</u>	<u>1.0 mg/kg</u>
-	<u>Benzo(b)fluoroanthrene</u>	<u>1.0 mg/kg</u>
-	<u>Benzo(j)fluoroanthrene</u>	<u>1.0 mg/kg</u>
-	<u>Benzo(k)fluoroanthrene</u>	<u>1.0 mg/kg</u>
-	<u>Dibenzo(a,h)anthracene</u>	<u>1.0 mg/kg</u>
-	<u>Sum of substances listed in Table 18.10(i)</u>	<u>10.0 mg/kg</u>
<u>Quinoline</u>	<u>Quinoline</u>	<u>50.0 mg/kg</u>
<u>Solvent residues</u>	<u>Dimethylacetamide (DMAC)</u>	<u>500 mg/kg</u>
-		<u>1000 mg/kg^b</u>
-	<u>Dimethylformamide (DMF)</u>	<u>500 mg/kg</u>
-		<u>1000 mg/kg^b</u>
		<u>3.0%^c</u>
-	<u>Formamide</u>	<u>200 mg/kg</u>
-	<u>N-Methyl-2-pyrrolidone (NMP)</u>	<u>500 mg/kg</u>
		<u>1000 mg/kg^b</u>
		<u>3.0%^c</u>
<u>UV absorbers or stabilizers</u>	<u>2-Benzotriazol-2-yl-4,6-di-tert-butylphenol (UV 320)</u>	<u>1000 mg/kg</u>
-	<u>2,4-Di-tert-butyl-6-(5-chlorobenzotriazol-2-yl) phenol (UV 327)</u>	<u>1000 mg/kg</u>
-	<u>2-(2H-Benzotriazol-2-yl)-4,6-di-tert-penthyphenol (UV 328)</u>	<u>1000 mg/kg</u>
-	<u>2-(2H-Benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV 350)</u>	<u>1000 mg/kg</u>
<u>Volatile organic compounds (VOCs)</u>	<u>Benzene</u>	<u>5 mg/kg</u>
-	<u>Each VOC listed in Table 18.10(k)</u>	<u>10 mg/kg</u>

^aA maximum level of 30 mg/kg of 1,2-Dichlorobenzene applies when C.I. Pigment Violet 23 (CAS No. 6358-30-1), Yellow 93 (CAS No. 5580-57-4), Orange 61 (CAS No. 40716-47), and Red 214 (CAS No. 82643-43-4) solution-dyed fibers are used *[see 18.10(6)]*.

^bA maximum level of 1000 mg/kg applies to materials made of acrylic, elastane, polyurethane, polyimide, aramids, and coated textiles *[see 18.10(20)]*.

^cA maximum level of 3.0 weight percent applies to material products that must undergo further industrial production stages, such as fibers that are spun with the aid of DMAC, DMF, or NMP *[see 18.10(21)]*.

Table 18.10(b) List of Restricted Azo-amines and Aryl Amine Salts

<u>Azo-amine or Aryl Amine Salt Chemical</u>	<u>CAS Number</u>
<u>4-Aminobiphenyl</u>	<u>92-67-1</u>
<u>Benzidine</u>	<u>92-87-5</u>
<u>4-Chloro-o-toluidine</u>	<u>95-69-2</u>
<u>2-Naphthylamine</u>	<u>91-59-8</u>
<u>o-Aminoazotoluene</u>	<u>97-56-3</u>
<u>2-Amino-4-nitrotoluene</u>	<u>99-55-8</u>
<u>p-Chloraniline</u>	<u>106-47-8</u>
<u>2,4-Diaminoaniso</u>	<u>615-05-4</u>
<u>4,4'-Diaminodiphenylmethane</u>	<u>101-77-9</u>
<u>3,3'-Dichlorobenzidine</u>	<u>91-94-1</u>
<u>3,3'-Dimethoxybenzidine</u>	<u>119-90-4</u>
<u>3,3'-Dimethylbenzidine</u>	<u>119-93-7</u>
<u>3,3'-dimethyl-4,4'-diaminodiphenylmethane</u>	<u>838-88-0</u>
<u>p-Cresidine</u>	<u>120-71-8</u>
<u>4,4'-Methylen-bis(2-chloraniline)</u>	<u>101-14-4</u>
<u>4,4'-Oxydianiline</u>	<u>101-80-4</u>
<u>4,4'-Thiodianiline</u>	<u>139-65-1</u>
<u>o-Toluidine</u>	<u>95-53-4</u>
<u>2,4-Toluenediamine</u>	<u>95-80-7</u>
<u>2,4,5-Trimethylaniline</u>	<u>137-17-7</u>
<u>2,4 Xylidine</u>	<u>95-68-1</u>
<u>2,6 Xylidine</u>	<u>87-62-7</u>
<u>2-Methoxyaniline (= o-Anisidine)</u>	<u>90-04-0</u>
<u>p-Aminoazobenzene</u>	<u>60-09-3</u>
<u>4-Chloro-o-toluidinium chloride</u>	<u>3165-93-3</u>
<u>2-Naphthylammoniumacetate</u>	<u>553-00-4</u>
<u>4-Methoxy-m-phenylene diammonium sulphate</u>	<u>39156-41-7</u>
<u>2,4,5-Trimethylaniline hydrochloride</u>	<u>21436-97-5</u>

Table 18.10(c) List of Restricted Chlorinated Benzenes and Toluenes

<u>Chlorinated Benzene or Toluene Chemical</u>	<u>CAS Number</u>
<u>2-Chlorotoluene</u>	<u>95-49-8</u>
<u>3-Chlorotoluene</u>	<u>108-41-8</u>
<u>4-Chlorotoluene</u>	<u>106-43-4</u>
<u>2,3-Dichlorotoluene</u>	<u>32768-54-0</u>
<u>2,4-Dichlorotoluene</u>	<u>95-73-8</u>
<u>2,5-Dichlorotoluene</u>	<u>19398-61-9</u>
<u>2,6-Dichlorotoluene</u>	<u>118-69-4</u>
<u>3,4-Dichlorotoluene</u>	<u>95-75-0</u>
<u>3,5-Dichlorotoluene</u>	<u>25186-47-4</u>
<u>2,3,5-Trichlorotoluene</u>	<u>56961-86-5</u>
<u>2,3,6-Trichlorotoluene</u>	<u>2077-46-5</u>
<u>2,4,5-Trichlorotoluene</u>	<u>6639-30-1</u>
<u>3,4,5-Trichlorotoluene</u>	<u>21472-86-6</u>

<u>Chlorinated Benzene or Toluene Chemical</u>	<u>CAS Number</u>
<u>2,4,6-Trichlorotoluene</u>	<u>23749-65-7</u>
<u>2,3,4,5-Tetrachlorotoluene</u>	<u>76057-12-0</u>
<u>2,3,4,6-Tetrachlorotoluene</u>	<u>875-40-1</u>
<u>2,3,5,6-Tetrachlorotoluene</u>	<u>1006-31-1</u>
<u>2,3,4,5,6-Pentachlorotoluene</u>	<u>877-11-2</u>
<u>1,2-Dichlorobenzene</u>	<u>95-50-1</u>
<u>1,3-Dichlorobenzene</u>	<u>541-73-1</u>
<u>Dichlorobenzenes</u>	<u>25321-22-6</u>
<u>1,4-Dichlorobenzene</u>	<u>106-46-7</u>
<u>1,2,3-Trichlorobenzene</u>	<u>87-61-6</u>
<u>1,2,4-Trichlorobenzene</u>	<u>120-82-1</u>
<u>1,3,5-Trichlorobenzene</u>	<u>108-70-3</u>
<u>Trichlorobenzenes</u>	<u>12002-48-1</u>
<u>1,2,3,4-Tetrachlorobenzene</u>	<u>634-66-2</u>
<u>1,2,3,5-Tetrachlorobenzene</u>	<u>634-90-2</u>
<u>1,2,4,5-Tetrachlorobenzene</u>	<u>95-94-3</u>
<u>Pentachlorobenzene</u>	<u>608-93-5</u>
<u>Hexachlorobenzene</u>	<u>118-74-1</u>
<u>p-Chlorobenzotrichloride</u>	<u>5216-25-1</u>
<u>Benzotrichloride</u>	<u>98-07-7</u>
<u>Benzyl chloride</u>	<u>100-44-7</u>

Table 18.10(d) List of Restricted Dyes

<u>Dye Chemical</u>	<u>CAS Number</u>
<u>C.I. Acid Red 26</u>	<u>3761-53-3</u>
<u>C.I. Acid Red 114</u>	<u>6459-94-5</u>
<u>C.I. Basic Blue 26</u>	<u>2580-56-5</u>
<u>C.I. Basic Green 4</u>	<u>569-4-2,</u>
-	<u>10309-95-2, and</u>
-	<u>2437-29-8</u>
<u>C.I. Basic Red 9</u>	<u>569-61-9</u>
<u>C.I. Basic Violet 3</u>	<u>548-62-9</u>
<u>C.I. Basic Violet 14</u>	<u>632-99-5</u>
<u>C.I. Basic Yellow 2</u>	<u>2465-27-2 and</u>
-	<u>492-80-9</u>
<u>C.I. Direct Black 38</u>	<u>1937-37-7</u>
<u>C.I. Direct Blue 6</u>	<u>2602-46-2</u>
<u>C.I. Direct Blue 15</u>	<u>2429-74-5</u>
<u>C.I. Direct Brown 95</u>	<u>16071-86-6</u>
<u>C.I. Direct Red 28</u>	<u>573-58-0</u>
<u>C.I. Disperse Blue 1</u>	<u>2475-45-8</u>
<u>C.I. Disperse Blue 3</u>	<u>2475-46-9</u>
<u>C.I. Disperse Blue 7</u>	<u>3179-90-6</u>
<u>C.I. Disperse Blue 26</u>	<u>3860-63-7</u>

<u>Dye Chemical</u>	<u>CAS Number</u>
<u>C.I. Disperse Blue 35</u>	<u>12222-75-2</u>
<u>C.I. Disperse Blue 102</u>	<u>12222-97-8</u>
<u>C.I. Disperse Blue 106</u>	<u>12223-01-7</u>
<u>C.I. Disperse Blue 124</u>	<u>61951-51-7</u>
<u>C.I. Disperse Brown 1</u>	<u>23355-64-8</u>
<u>C.I. Disperse Orange 1</u>	<u>2581-69-3</u>
<u>C.I. Disperse Orange 3</u>	<u>730-40-5</u>
<u>C.I. Disperse Orange 11</u>	<u>82-28-0</u>
<u>C.I. Disperse Orange 37/59/76</u>	<u>12223-33-5,</u> <u>13301-61-6, and</u> <u>51811-42-8</u>
-	
<u>C.I. Disperse Orange 149</u>	<u>85136-74-9</u>
<u>C.I. Disperse Red 1</u>	<u>2872-52-8</u>
<u>C.I. Disperse Red 11</u>	<u>2872-48-2</u>
<u>C.I. Disperse Red 17</u>	<u>3179-89-3</u>
<u>C.I. Disperse Yellow 1</u>	<u>119-15-3</u>
<u>C.I. Disperse Yellow 3</u>	<u>2832-40-8</u>
<u>C.I. Disperse Yellow 9</u>	<u>6373-73-5</u>
<u>C.I. Disperse Yellow 23</u>	<u>6250-23-3</u>
<u>C.I. Disperse Yellow 49</u>	<u>54824-37-2</u>
<u>C.I. Pigment Red 104 (lead chromate molybdate sulphate red)</u>	<u>12656-85-8</u>
<u>C.I. Pigment Yellow 34 (lead sulfochromate yellow)</u>	<u>1344-37-2</u>
<u>C.I. Solvent Blue 4</u>	<u>6786-83-0</u>
<u>C.I. Solvent Yellow 1 (4-Aminoazobenzene)</u>	<u>60-09-2</u>
<u>C.I. Solvent Yellow 3 (2-Aminoazobenzene)</u>	<u>97-56-3</u>
<u>4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol</u>	<u>561-41-1</u>

Table 18.10(e) List of Restricted Flame Retardant Substances

<u>Flame Retardant Chemical</u>	<u>CAS Number</u>
<u>Decabromodiphenyl ethane (DBDPE)</u>	<u>84852-53-9</u>
<u>Pentabromodiphenyl ether (PentaBDE)</u>	<u>32534-81-9</u>
<u>Octabromodiphenyl ether (OctaBDE)</u>	<u>32536-52-0</u>
<u>Decabromodiphenyl ether (DecaBDE)</u>	<u>1163-19-5</u>
<u>All other polybrominated diphenyl ethers (PBDEs)</u>	<u>Various</u>
<u>Tetrabromobisphenol A (TBBP A)</u>	<u>79-94-7</u>
<u>Polybromobiphenyls (PBB)</u>	<u>59536-65-1</u>
<u>Hexabromocyclododecane (HBCDD)</u>	<u>3194-55-6</u>
<u>2,2-bis(bromomethyl)-1,3-propanediol (BBMP)</u>	<u>3296-90-0</u>
<u>Tris(1,3-dichloro-isopropyl) phosphate (TDCPP)</u>	<u>13674-87-8</u>
<u>Trixylyl phosphate (TXP)</u>	<u>25155-23-1</u>
<u>Tris(2,3,-dibromopropyl) phosphate (TRIS)</u>	<u>126-72-7</u>
<u>Tris(1-aziridiny)phosphine oxide) (TEPA)</u>	<u>545-55-1</u>
<u>Tris(2-chloroethyl)phosphate (TCEP)</u>	<u>115-96-8</u>
<u>Bis(2,3-dibromopropyl) phosphate (BIS)</u>	<u>5412-25-9</u>

Table 18.10(f) List of Restricted Nitrosamines

<u>Nitrosamine Chemical</u>	<u>CAS Number</u>
<u>N-nitrosodimethylamine (NDMA)</u>	<u>62-75-9</u>
<u>N-nitrosodiethylamine (NDEA)</u>	<u>55-18-5</u>
<u>N-nitrosodipropylamine (NDPA)</u>	<u>621-64-7</u>
<u>N-nitrosodibutylamine (NDBA)</u>	<u>924-16-3</u>
<u>N-nitrosopiperidine (NPIP)</u>	<u>100-75-4</u>
<u>N-nitrosopyrrolidine (NPYR)</u>	<u>930-55-2</u>
<u>N-nitrosomorpholine (NMOR)</u>	<u>59-89-2</u>
<u>N-nitroso N-methyl N-phenylamine (NMPHA)</u>	<u>614-00-6</u>
<u>N-nitroso N-ethyl N-phenylamine (NEPHA)</u>	<u>612-64-6</u>

Table 18.10(g) List of Restricted Organotin Substances

<u>Organotin Chemical</u>	<u>CAS Number</u>
<u>Dibutyltin (DBT)</u>	<u>Various</u>
<u>Dimethyltin (DMT)</u>	<u>Various</u>
<u>Dicotyltin (DOT)</u>	<u>Various</u>
<u>Diphenyltin (DPhT)</u>	<u>Various</u>
<u>Dipropyltin (DPT)</u>	<u>Various</u>
<u>Monobutyltin (MBT)</u>	<u>Various</u>
<u>Monooctyltin (MOT)</u>	<u>Various</u>
<u>Monomethyltin (MMT)</u>	<u>Various</u>
<u>Monophenyltin (MPhT)</u>	<u>Various</u>
<u>Tetrabutyltin (TeBT)</u>	<u>Various</u>
<u>Tetraethyltin (TeET)</u>	<u>Various</u>
<u>Tetraoctyltin (TeOT)</u>	<u>Various</u>
<u>Tricylohexyltin (TCyHT)</u>	<u>Various</u>
<u>Trimethyltin (TMT)</u>	<u>Various</u>
<u>Trioctyltin (TOT)</u>	<u>Various</u>
<u>Tripropyltin (TPT)</u>	<u>Various</u>

Table 18.10(h) List of Restricted Phthalate Substances

<u>Phthalate Chemical</u>	<u>CAS Number</u>
<u>Butylbenzylphthalate (BBP)</u>	<u>85-68-7</u>
<u>Dibutylphthalate (DBP)</u>	<u>84-74-2</u>
<u>Diethylphthalate (DEP)</u>	<u>84-66-2</u>
<u>Dimethylphthalate (DMP)</u>	<u>131-11-3</u>
<u>Di-(2-ethylhexyl)-phthalate (DEHP)</u>	<u>117-81-7</u>
<u>Di-(2-methoxyethyle)-phthalate (DMEP)</u>	<u>117-82-8</u>
<u>Di-C6-8 branched alkylphthalates (DIHP)</u>	<u>71888-89-6</u>
<u>Di-C7-11 branched and linear alkylphthalates (DHNUP)</u>	<u>68515-42-4</u>
<u>Di-cyclohexyl phthalate (DCHP)</u>	<u>84-61-7</u>
<u>Di-hexylphthalates, branched and linear (DHxP)</u>	<u>68515-50-4</u>
<u>Di-iso-butylphthalate (DIBP)</u>	<u>84-69-5</u>

<u>Phthalate Chemical</u>	<u>CAS Number</u>
<u>Di-iso-hexyl phthalate (DIHxP)</u>	<u>71850-09-4</u>
<u>Di-iso-octyl phthalate (DIOP)</u>	<u>27554-26-3</u>
<u>Di-iso-nonylphthalate (DINP)</u>	<u>28553-12-0, 68515-48-0</u>
<u>Di-iso-decylphthalate (DIDP)</u>	<u>26761-40-0, 68515-49-1</u>
<u>Di-n-propyl phthalate (DPrP)</u>	<u>131-16-8</u>
<u>Di-n-hexylphthalate (DHP)</u>	<u>84-75-3</u>
<u>Di-n-octylphthalate (DNOP)</u>	<u>117-84-0</u>
<u>Di-n-nonylphthalate (DNP)</u>	<u>84-76-4</u>
<u>Di-n-pentyl phthalate (DPP), also iso-, or mixed</u>	<u>131-18-0,</u>
-	<u>605-50-5,</u>
-	<u>776297-69-9, and</u>
-	<u>84777-06-0</u>
<u>1,2-Benzenedicarboxylic acid, di-C6-10-alkyl esters</u>	<u>68515-51-5</u>
<u>1,2-Benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters</u>	<u>68648-93-1</u>

Table 18.10(i) List of Restricted Polycyclic Aromatic Hydrocarbon (PAH) Substances

<u>PAH Chemical</u>	<u>CAS Number</u>
<u>Acenaphthene</u>	<u>83-32-9</u>
<u>Acenaphthylene</u>	<u>208-96-8</u>
<u>Anthracene</u>	<u>20-12-7</u>
<u>Benzo[a]anthracene</u>	<u>56-55-3</u>
<u>Benzo[a]pyrene</u>	<u>50-32-8</u>
<u>Benzo[b]fluoranthene</u>	<u>205-99-2</u>
<u>Benzo[e]pyrene</u>	<u>192-97-2</u>
<u>Benzo[g,h,i]perylene</u>	<u>191-24-2</u>
<u>Benzo[j]fluoranthene</u>	<u>205-82-3</u>
<u>Benzo(k)fluoranthene</u>	<u>207-08-9</u>
<u>Chrysene</u>	<u>218-01-9</u>
<u>Cyclopenta[c,d]pyrene</u>	<u>27208-37-3</u>
<u>Dibenzo[a,h]anthracene</u>	<u>53-70-3</u>
<u>Dibenzo[a,e]pyrene</u>	<u>192-65-4</u>
<u>Dibenzo[a,h]pyrene</u>	<u>189-64-0</u>
<u>Dibenzo[a,i]pyrene</u>	<u>189-55-9</u>
<u>Dibenzo[a,l]pyrene</u>	<u>191-30-0</u>
<u>Fluoranthene</u>	<u>206-44-0</u>
<u>Fluorene</u>	<u>86-73-7</u>
<u>Indeno(1,2,3-cd)pyrene</u>	<u>193-39-5</u>
<u>1-Methylpyrene</u>	<u>2381-21-7</u>
<u>Naphthalene</u>	<u>91-20-3</u>
<u>Phenanthrene</u>	<u>85-01-8</u>
<u>Pyrene</u>	<u>129-00-0</u>

Table 18.10(j) List of Perfluorinated and Polyfluorinated Compounds (PFCs)

<u>PFC Chemical</u>	<u>CAS Number</u>	<u>Acronym</u>
<i><u>C9-C14 PFCA-related substances</u></i>		
<u>Perfluorooctane sulfonic acid and sulfonates</u>	<u>1763-23-1, et al.</u>	<u>PFOS</u>
<u>Perfluorooctane sulfonamide</u>	<u>754-91-6</u>	<u>PFOSA</u>
<u>Perfluorooctane sulfonfluoride</u>	<u>307-35-7</u>	<u>PFOSF/POSF</u>
<u>N-Methyl perfluorooctane sulfonamide</u>	<u>31506-32-8</u>	<u>N-Me-FOSA</u>
<u>N-Ethyl perfluorooctane sulfonamide</u>	<u>4151-50-2</u>	<u>N-Et-FOSA</u>
<u>N-Methyl perfluorooctane sulfonamide ethanol</u>	<u>24448-09-7</u>	<u>N-Me-FOSE</u>
<u>N-Ethyl perfluorooctane sulfonamide ethanol</u>	<u>1691-99-2</u>	<u>N-Et-FOSE</u>
<u>Perfluoroheptanoic acid and salts</u>	<u>375-85-9, et al.</u>	<u>PFHpA</u>
<u>Perfluorooctanoic acid and salts</u>	<u>335-67-1, et al.</u>	<u>PFOA</u>
<u>Perfluorononanoic acid and salts</u>	<u>375-95-1, et al.</u>	<u>PFNA</u>
<u>Perfluorodecanoic acid and salts</u>	<u>335-76-2, et al.</u>	<u>PFDA</u>
<u>Henicosafuoroundecanoic acid and salts</u>	<u>2058-94-8, et al.</u>	<u>PFUdA</u>
<u>Tricosafuorododecanoic acid and</u>	<u>307-55-1, et al.</u>	<u>PFDoA</u>
<u>Pentacosafuorotridecanoic acid and salts</u>	<u>72629-94-8, et al.</u>	<u>PFTTrDA</u>
<u>Heptacosafuorotetradecanoic acid and salts</u>	<u>376-06-7, et al.</u>	<u>PFTeDA</u>
<i><u>Further perfluorinated carboxylic acids</u></i>		
<u>Perfluorobutanoic acid and salts</u>	<u>375-22-4, et al.</u>	<u>PFBA</u>
<u>Perfluoropentanoic acid and salts</u>	<u>2706-90-3, et al.</u>	<u>PFPeA</u>
<u>Perfluorohexanoic acid and salts</u>	<u>307-24-4, et al.</u>	<u>PFHxA</u>
<u>Perfluoro(3,7-dimethyloctanoic acid) and salts</u>	<u>172155-07-6, et al.</u>	<u>PF-3,7-DMOA</u>
<i><u>Perfluorinated carboxylic and sulfonic acids under observation</u></i>		
<u>2,3,3,3-tetrafluoro-2-(heptafluoro propoxy) propionic acid, its various salts and its acyl halides</u>	<u>various</u>	<u>-</u>
<i><u>Perfluorinated sulfonic acids</u></i>		
<u>Perfluorobutane sulfonic acid and salts</u>	<u>375-73-5, 59933-66-3, et al.</u>	<u>PFBS</u>
<u>Perfluorohexane sulfonic acid and salts</u>	<u>355-46-4, et al.</u>	<u>PFHxS</u>
<u>Perfluoroheptane sulfonic acid and salts</u>	<u>375-92-8, et al.</u>	<u>PFHpS</u>
<u>Henicosafuorodecane sulfonic acid and salts</u>	<u>335-77-3, et al.</u>	<u>PFDS</u>
<i><u>Partially fluorinated carboxylic/sulfonic acids</u></i>		
<u>7H-Perfluoro heptanoic acid and salts</u>	<u>1546-95-8, et al.</u>	<u>7HPFHpA</u>
<u>2H,2H,3H,3H-Perfluoroundecanoic acid and salts</u>	<u>34598-33-9, et al.</u>	<u>4HPFUnA</u>
<u>1H,1H,2H,2H-Perfluorooctane sulfonic acid and salts</u>	<u>27619-97-2, et al.</u>	<u>6:2 FTS</u>
<i><u>PFOA-related substances</u></i>		
<u>1H,1H,2H,2H-Perfluorodecyl acrylate</u>	<u>27905-45-9</u>	<u>8:2 FTA</u>
<u>1H,1H,2H,2H-Perfluoro-1-decanol</u>	<u>678-39-7</u>	<u>8:2 FTOH</u>
<u>1H,1H,2H,2H-Perfluorodecanesulphonic acid and its salts</u>	<u>39108-34-4, et al.</u>	<u>8:2 FTS</u>
<i><u>Partially fluorinated linear alcohols</u></i>		
<u>1H,1H,2H,2H-Perfluoro-1-decanol</u>	<u>678-39-7</u>	<u>8:2 FTOH</u>
<u>1H,1H,2H,2H-Perfluoro-1-dodecanol</u>	<u>865-86-1</u>	<u>10:2 FTOH</u>
<i><u>Esters of fluorinated alcohols with acrylic acid</u></i>		
<u>1H,1H,2H,2H-Perfluorooctyl acrylate</u>	<u>17527-29-6</u>	<u>6:2 FTA</u>

<u>PFC Chemical</u>	<u>CAS Number</u>	<u>Acronym</u>
<u>1H,1H,2H,2H-Perfluorodecyl acrylate</u>	<u>27905-45-9</u>	<u>8:2 FTA</u>
<u>1H,1H,2H,2H-Perfluorododecyl acrylate</u>	<u>17741-60-5</u>	<u>10:2 FTA</u>

Table 18.10(k) List of Restricted Volatile Organic Compounds

<u>Volatile Organic Compound</u>	<u>CAS Number</u>
<u>Carbon disulfide</u>	<u>'1-43-2</u>
<u>Carbon tetrachloride</u>	<u>75-15-0</u>
<u>Chloroform</u>	<u>67-66-3</u>
<u>Cyclohexanone</u>	<u>108-94-1</u>
<u>1,2-Dichloroethane</u>	<u>107-06-2</u>
<u>1,2-Dichlorethylene</u>	<u>75-35-4</u>
<u>Ethylbenzene</u>	<u>100-41-4</u>
<u>Pentachloroethane</u>	<u>76-01-7</u>
<u>1,1,1,2-Tetrachloroethane</u>	<u>630-20-6</u>
<u>1,1,2,2-Tetrachloroethane</u>	<u>73-34-5</u>
<u>Tetrachloroethylene</u>	<u>127-18-4</u>
<u>Toluene</u>	<u>108-88-3</u>
<u>1,1,1-Trichloroethane</u>	<u>71-55-6</u>
<u>1,1,2-Trichloroethane</u>	<u>79-00-5</u>
<u>Trichloroethylene</u>	<u>79-01-6</u>
<u>Xylenes (meta-, ortho-, para-)</u>	<u>1330-20-7, 108-38-3, 95-47-6, and 106-24-3</u>

A.18.10 The specific limits or criteria for restricted substances are derived from the combination of the 2024 editions of the OEKO-TEX Standard 100, the Supplement PPE & Materials OEKO-TEX Standard 100, and the AFIRM Restricted Substances List.

The certification organization should use its best judgment in determining the relevant categories of restricted substances to be evaluated based on the information provided by the manufacturer or supplier for the respective material(s) and component(s).

5. Add a new section 19.37 to read as follows:

19.37 PPE-Based Hazardous Substances Requirements.

19.37.1 Tests for Acceptable Levels of Specific Restricted Substances.

19.37.1.1* Specified components of specified protective elements and items shall be both evaluated for each listed restricted substance or category of restricted substances and not exceed the maximum concentration as specified in Table 9.37.1.1.

Table 19.37.1.1 Test Methods for Evaluating Protective Element Components for Specific Restrictive Substances

<u>Chemical Class or Group</u>	<u>Restricted Substance(s)</u>	<u>Test Method</u>
<u>Acetophenone and 2-Phenyl-2-propanol</u>	<u>Acetophenone and 2-Phenyl-2-propanol</u>	<u>Extraction in acetone or methanol, sonification for 30 minutes at 60°C (140°F); analysis by GC/MS</u>
<u>Acidity and alkaline substances</u>	<u>Measured by reporting pH</u>	<u>Textiles and artificial leather: ISO 3071 using KCl solution</u>
<u>Akyl phenols and</u>	<u>4-tert Butylphenol, nonylphenol,</u>	<u>Textiles: ISO 21084</u>

<u>Chemical Class or Group</u>	<u>Restricted Substance(s)</u>	<u>Test Method</u>
<u>ethoxylates</u>	<u>octylphenol, heptaphenol, and pentyphenol</u>	<u>Polymers and other materials: 1 g sample/20 mL THF, sonification for 60 min at 70°C (158°F) with analysis in accordance with ISO 21084</u>
-	-	<u>All materials:</u>
-	<u>Nonylphenoethoxylates and octylphenol-ethoxylates</u>	<u>ISO 18254-1 with analysis using LC/MS or LC/MS/MS</u>
-	-	<u>All materials: ISO 14362-1</u>
<u>Azo-amines and aryl amine salts</u>	<u>See Table 18.10(b)</u>	<u>For p-aminoazobenzene:</u>
-	-	<u>All materials: ISO 14362-3</u>
<u>Bisphenol</u>	<u>Bisphenol A, Bisphenol B, and Bisphenol S</u>	<u>All materials, extraction: 1 g sample/20 ml THF, sonication for 60 minutes at 60°C (140°F), analysis with LC/MS</u>
<u>Chlorinated benzenes and toluenes</u>	<u>See Table 18.10(c)</u>	<u>All materials: EN 17137</u>
<u>Chlorinated paraffins</u>	<u>Short-chain and medium chain chlorinated paraffins</u>	<u>ISO 22818</u>
<u>Chlorinated phenols</u>	<u>Pentachlorophenol</u>	<u>All materials: EN 17134-2</u>
-	<u>Tetrachlorophenols</u>	-
-	<u>Trichlorophenols</u>	-
-	<u>Dichlorophenols</u>	-
-	<u>Monochlorophenols</u>	-
<u>Dyes</u>	<u>See Table 18.10(d)</u>	<u>All materials: DIN 54231</u>
-	<u>Navy Blue: Component 1: C₃₉H₂₃ClCrN₇O₁₂S₂.2Na; and Component 2: C₄₆H₃₀CrN₁₀O₂₀S₂.3Na</u>	<u>All materials: DIN 54231</u>
<u>Flame retardants</u>	<u>See Table 18.10(e)</u>	<u>All materials: ISO 17881-1 and ISO 17881-2</u>
<u>Formaldehyde</u>	<u>Free and partially releasable</u>	<u>All materials: ISO 14184-1</u>
<u>Heavy metals, extractable</u>	<u>Antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, and selenium</u>	<u>All materials: EN 16711-2</u>
-	<u>Chromium VI</u>	<u>Textiles: EN 16711-2 with ISO 17075-1 if chromium is detected</u>
<u>Heavy metals, total content</u>	<u>Arsenic, cadmium, and mercury</u>	<u>All materials: EN 16711-2</u>
-	<u>Lead</u>	<u>All materials: CPSC-CH-E1002-08.3</u>

<u>Chemical Class or Group</u>	<u>Restricted Substance(s)</u>	<u>Test Method</u>
<u>Monomers</u>	<u>Styrene, free</u>	<u>Extraction in methanol; GC/MS, sonication at 60°C (140°F) for 60 minutes</u>
-	<u>Vinyl chloride</u>	<u>All materials: ISO 6401</u>
<u>Nitrosamines</u>	<u>See Table 18.10(f)</u>	<u>All materials: ISO 19577</u>
<u>Organotin compounds</u>	<u>Tributyltin (TBT), triphenyltin (TPhT), and chemicals in Table 18.10(g)</u>	<u>All materials: ISO/TS 16179</u>
<u>Ortho-phenylphenol</u>	<u>Ortho-phenylphenol</u>	<u>All materials: DIN 50009</u> <u>All materials: Combustion ion chromatography in accordance with modified ASTM D7359 or particle-induced gamma emission (PIGE) with a minimum detection limit of 0.5 mg/kg</u> <u>All materials: EN 14582 or ASTM D7359</u>
<u>Perfluorinated and polyfluorinated compounds</u>	<u>Total fluorine</u> <u>Total organic fluorine (extractable) individual chemicals in accordance with Table 18.10(j)</u>	<u>All materials: ISO 23702-1 or EN 17681-1 and EN 17681-2</u> <u>EN 14582 or ASTM D7359</u>
<u>Phthalates</u>	<u>See Table 18.10(h)</u>	<u>Sample preparation for all materials: CPSC-CH-C1001-09.4</u>
-	-	<u>Measurement:</u>
-	-	<u>Textiles: GC/MS, ISO 14389</u>
-	-	<u>All materials except textiles: GC/MS</u>
<u>Polycyclic aromatic hydrocarbons (PAH)</u>	<u>See Table 18.10(i)</u>	<u>All materials: AFPS GS 2019:01</u>
<u>Quinoline</u>	<u>Quinoline</u>	<u>All materials: DIN 54231 with methanol extraction at 70°C (158°F)</u>
<u>Solvent residues</u>	<u>Dimethylformamide, and N-methyl-2-pyrrolidone</u>	<u>Textiles: EN 17131 All other materials: ISO/TS 16189</u>
<u>UV stabilizers</u>	<u>2-Benzotriazol-2-yl-4,6-di-tert-butylphenol (UV 320),</u> <u>2,4-Di-tert-butyl-6-(5-chlorobenzotriazol-2-yl) phenol (UV 327),</u> <u>2-(2H-Benzotriazol-2-yl)-4,6-di-tert-pentylphenol (UV 328), and</u> <u>2-(2H-Benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV 350)</u>	<u>EN 62321-6; extraction in THF, analysis by GC/MS)</u>
-	-	-
-	-	-
-	-	-
<u>Volatile organic</u>	<u>See Table 18.10(k)</u>	<u>GC/MS headspace 45 minutes at</u>

<u>Chemical Class or Group</u>	<u>Restricted Substance(s)</u>	<u>Test Method</u>
<u>compounds (VOCs)</u>		<u>120°C (248°F)</u>
<u>A.19.37.1.1 Identified test methods for restricted substances are based on information in both the 2024 editions of the OEKO-TEX Standard 100 and the AFIRM Restricted Substances List.</u> <u>19.37.1.2 Alternative test methods shall be permitted if the test method can demonstrate it is capable of providing a lower limit of quantification that is at the specified limit or below established for the respective substance in Table 18.10(a), unless otherwise stated in Table 9.37.1.1, and that provides an 80 percent or better recovery of the respective substance from the tested material or component.</u> <u>19.37.1.3 The report for this testing shall include the identification of the recognized component, the specific restricted substances evaluated, and the measured level for each restricted substance against the limits established in Section 18.10. Acceptable Levels of Restricted Substances in Specified Protective Element Recognized Components.</u> <u>19.37.2 Test for Total Fluorine.</u> <u>19.37.2.1 Application. This test method shall apply to any protective element or item for which the manufacturer is making the claim that is permitted in 16.1.7.3.</u> <u>19.37.2.2 Selection of Samples for Evaluation.</u> <u>19.37.2.2.1 Garment textile fabrics including particulate-blocking layers but excluding interlinings shall be recognized components that meet levels of restricted substances as specified in Section 8.10, Acceptable Levels of Restricted Substances in Specified Protective Element Recognized Components.</u> <u>19.37.2.2.2 Garment visibility markings and findings, including thread, labels, emblems, collar stays, elastic and hook-and-pile fasteners, buttons, and other closure hardware, shall be excluded from the testing in 19.37.2.2.2.</u> <u>19.37.2.3 Samples.</u> <u>19.37.2.3.1 The size of the respective samples from the applicable material or component shall be as specified in the specific procedure applied.</u> <u>19.37.2.3.2 A minimum default sample size of 5 g (0.18 oz) shall be used if specimen size or weight is not specified in the selected procedure.</u> <u>19.37.2.3.3 The selected samples shall include all specific non-separable parts, layers, or attributes of the applicable material or component.</u> <u>19.37.2.3.4 The selected samples shall be taken in the same way from each source material or component so that they are as identical as possible in representing the specific material or component.</u> <u>19.37.2.4 Specimens.</u> <u>19.37.2.4.1 A minimum of three specimens taken from separate unique lots for each applicable material or component shall be evaluated.</u> <u>19.37.2.4.2 Each specimen shall represent all parts, layers, or attributes of the applicable material or component being tested.</u> <u>19.37.2.5* Procedure.</u> <u>Total fluorine shall be measured in accordance with either ASTM D7359, <i>Standard Test Method for Total Fluorine, Chlorine, and Sulfur in Aromatic Hydrocarbons and Their Mixtures by Oxidative Pyrohydrolytic Combustion followed by Ion Chromatography Detection (Combustion Ion Chromatography–CIC)</i>, or an equivalent method for total fluorine by ion chromatography, with the following modifications:</u> <u>(1) Only total fluorine shall be measured.</u> <u>(2) The total fluorine measurement shall be reported in ppm.</u> <u>A.19.37.2.5</u> <u>An equivalent combustion ion chromatography procedure is described in</u>		

“Combined use of total fluorine and oxidative fingerprinting for quantitative determination of side-chain fluorinated polymers in textiles,” (Liagkouridis, I., et al.).

19.37.2.6 Report.

19.37.2.6.1 The total fluorine measurements for each specimen of each tested material and component shall be reported.

19.37.2.6.2 The average total fluorine measurement of all specimens shall be reported.

19.37.2.6.3 A separate laboratory report shall be prepared on the total fluorine results of all applicable materials and components specific to the protective element for which the product label claim in 16.1.7.3 is being made.

19.37.2.6.4 The laboratory report shall include the following information:

(1) The name and address of the laboratory.

(2) The specific procedures used for the measurement of total fluorine.

(3) The specific laboratory quality control procedures used in the measurement of total fluorine.

(4) The individual specimen and average total fluorine results for each evaluated material and component of the subject protective element.

(5) An indication of the material or component that has the highest reported average total fluorine measurement.

19.37.2.7 Interpretation. The total fluorine concentration to be used as the basis of permitting the optional product label claim in 16.1.7.3 shall be the highest reported average total fluorine measurement of any materials or components that are evaluated for the respective protective element.

Substantiation: With the introduction of the ability to make PFAS-related labeling claims and requirements addressing levels of restricted substances in NFPA 1971 structural/proximity protective ensemble elements, it is paramount that the same approach be applied to wildland fire fighting and urban interface protective garments that fire fighters and other emergency responders are likely to wear in the course of their duties, over extended periods of time and at greater frequencies. The ability to make PFAS-related product/content claims and addressing restricted substances is becoming more pertinent as greater scrutiny has been applied to these chemicals through both fire fighter demands for this information over concerns of chronic exposures from the wearing of clothing, as well as new regulations that will affect the PPE and PPC available to fire fighters arising from legislatures across multiple jurisdictions who utilize and reference NFPA standards.

A compelling reason for the introduction of these requirements is found in NIST Technical Note 2313, *Per- and Polyfluoroalkyl Substances in Textiles Present in Firefighter Gloves, Hoods, and Wildland Gear*, which shows elevated levels of specific PFAS in some wildland protective garments contrary to the expectations of some fire fighters, and contrary to manufacturer labels denoting these garments as “non-fluorinated”. See results at [1](#). For this proposed amendment, the scope of these requirements is limited to wildland firefighting garments given the information provided in the above referenced report but can be expanded to other protective elements or items in the future given the manner in which this amendment has been structured.

The proposed changes utilize the exact same requirements found in the certification, labeling and user information, design, performance, and test method requirements that are applied to NFPA 1971 products, but have been specifically adapted for their application to textile fabrics used in wildland protective garments. Some of the proposed changes are necessary to broaden the current requirements in common Chapters 2, 3, and 4 of the NFPA 1950 standard that relate to referenced publications, definitions and certification process involving component recognition that specifically addresses restricted substances. This approach ensures a consistent application

of criteria and practice across fire service PPE/PPC for the implementation of these requirements.

Emergency Nature: The proposed TIA intends to correct a previously unknown existing hazard. The proposed TIA intends to offer to the public a benefit that would lessen a recognized (known) hazard or ameliorate a continuing dangerous condition or situation.

Fire fighters are already exposed to a myriad of different hazards including significant levels of contamination from the fireground environment. The protective clothing that fire fighters wear for their health and safety should not be an additional source for any hazardous chemicals. With a number of states already enacting regulations to provide restrictions on the types of substances that can be used in the manufacture of fire fighter PPE, the incorporation of these parallel requirements to those of NFPA 1971 are needed to ensure that fire fighters are afforded work apparel that does not contribute above their workplace exposures, or conflict with state legislation. Thus, the ability for addressing restricted substances in addition to permitting PFAS-content related claims for work apparel offers a benefit to fire fighters and other first responders in a lesser potential level of exposure to various restricted substances and a consistently demonstrated approach for complying with several current and upcoming regulations.

Anyone may submit a comment by the closing date indicated above. Please identify the TIA number, state whether you SUPPORT or OPPOSE the TIA along with your comment, and forward to the Secretary, Standards Council. [SUBMIT A COMMENT](#)