1. Revise 2.3.3 to read as follows:


2. Revise 5.1.7 to read as follows:

5.1.7 The following information shall also be printed legibly on each product label with all letters at least 1.5 mm (1/16 in.) in height:
(1) Manufacturer’s name, identification, or designation
(2) Manufacturer’s address
(3) Country of manufacture
(4) Manufacturer’s element identification number, lot number, or serial number
(5) Month and year of manufacture, not coded
(6) Model name, number, or design
(7) Size or size range
(8) Principal material(s) of construction include at least the identification of the fiber or material type used in the outer shell, moisture barrier, thermal liner, glove lining, gauntlet, and wristlet
(9) Where the principal material of construction used in a garment is a component that is listed the component name under which it is listed shall be identified.
(10) Cleaning precautions

5.1.7.1 For garments only, where the principal material of construction is a component that is listed, the component name under which it is listed shall be identified.

5.1.7.2 For garments only, where the thermal liner, moisture barrier, and outer shell are separable, each separable layer shall also have a label containing the information required in 5.1.7(4) through 5.1.7(9).

5.1.7.3* For footwear only, principal materials of construction shall include at least the outer shell, moisture barrier, and thermal liner materials. Generic names of materials shall be used. Additional materials that are used throughout the majority of the boot shall also be listed on the label.

5.1.7.4* For helmets only, principal materials of construction shall include generic terminology for the shell material provided.

5.1.7.5* For gloves only, principal materials of construction shall include at least outer shell, moisture barrier, thermal liner, and wristlet materials. Generic names of materials shall be used. The type of leather shall be listed, such as cow leather, elk leather, and so forth. Additional materials that are used throughout the majority of the glove body shall also be listed on the label.

3. Delete existing 5.1.8 through 5.1.11.

4. Revise Paragraph 7.7.7 to read as follows:

7.7.7 The glove interface component composite, including, but not limited to, trim, external labels, and external tags, but excluding hardware and hook and pile fasteners that do not directly contact the wearer’s body, shall be tested for resistance to flame as specified in Section 8.4, Flame Resistance Test 3, and shall not have an average char length of more than 100 mm (4 in.), shall not have an average afterflame of more than 2.0 seconds, shall not melt or drip, and shall not have the amount of consumed materials exceed 5 percent.
5. Revise Paragraph 7.7.8 to read as follows:

7.7.8 The glove extension composite, including, but not limited to, trim, external labels, and external tags, but excluding hardware and hook and pile fasteners that do not directly contact the wearer’s body, shall be tested for resistance to flame as specified in Section 8.4, Flame Resistance Test 3, and shall not have an average char length of more than 100 mm (4 in.), shall not have an average afterflame of more than 2.0 seconds, shall not melt or drip, and shall not have the amount of consumed materials exceed 5 percent.

6. Revise 7.10.9 to read as follows:

7.10.9 Footwear soles and heels shall be tested for resistance to abrasion as specified in Section 8.23 Abrasion Resistance Test, and the relative volume loss shall not be greater than 200 mm$^3$.

7. Revise 8.1.11.4 and add a new Table 8.1.11.4(c) to read as follows:

8.1.11.4 The wash cycle procedure and water levels specified in Table 8.1.11.4 (a), and Table 8.1.11.4 (b) and Table 8.1.11.4 (c) shall be followed. In addition, the G force shall not exceed 100 G throughout the wash cycle.

<table>
<thead>
<tr>
<th>Table 8.1.11.4 (c) Water Level for Gloves and Glove Pouches</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation Wash Cycle Procedure</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Low Water</strong></td>
</tr>
<tr>
<td><strong>High Water</strong></td>
</tr>
<tr>
<td>Level</td>
</tr>
<tr>
<td>+ 1 cm (3/8 in)</td>
</tr>
<tr>
<td>cm</td>
</tr>
<tr>
<td>Gloves</td>
</tr>
<tr>
<td>Glove Pouches</td>
</tr>
</tbody>
</table>

8. Revise 8.6.16 to read as follows:

8.6.16.11 The percent shrinkage of each hood face opening dimension shall be individually calculated, recorded, and reported.

8.6.16.12 The percent shrinkage of each of the three dimensions from the top of the hood to the marks along the basic plane shall be individually calculated, recorded, and reported.

8.6.16.13* The average percent shrinkage of all hood face opening dimensions for each all specimens shall be calculated, recorded, and reported.

8.6.16.14* The average percent shrinkage of the three dimensions from the top of the hood to the marks along the basic plane for each all specimens shall be calculated, recorded, and reported.

8.6.16.15 Pass or fail performance shall be based separately on the average percent shrinkage of the hood face opening dimensions and the average percent shrinkage of the three dimensions from the top of the hood to the marks along the basic plane for each all specimens. One or more hood specimens failing this test shall constitute failing performance.

9. Replace existing 8.24.9.7 through 8.24.9.14 with the following:

8.24.9.7 Each of the three dimensions from the top of the hood to the marks along the basic plane before and after laundering shall be recorded and reported.
8.24.9.8 The percent shrinkage of each hood face opening dimension shall be individually calculated, recorded, and reported.

8.24.9.9 The percent shrinkage of each of the three dimensions from the top of the hood to the marks along the basic plane shall be individually calculated, recorded, and reported.

8.24.9.10* The average percent shrinkage of all hood face opening dimensions for all specimens shall be calculated, recorded, and reported.

8.24.9.11* The average percent shrinkage of the three dimensions from the top of the hood to the marks along the basic plane for all specimens shall be calculated, recorded, and reported.

8.24.9.12 Pass or fail performance shall be based separately on the average percent shrinkage of the hood face opening dimensions and the average percent shrinkage of the three dimensions from the top of the hood to the marks along the basic plane for all specimens.

10. Revise Paragraph 8.27.8.2 to read as follows:

8.27.8.2 Samples for conditioning shall be in the form of a pouch as described in 8.1.15.

11. Revise Paragraph 8.28.8.2 to read as follows:

8.28.8.2 Samples for conditioning shall be in the form of a pouch as described in 8.1.15.

12. Revise 8.40.4(4)* and add a new 8.40.4(5) to read as follows:

(4)* Calibration of the tiles shall be checked every 10 tests (50 test runs) or prior to each day of testing, whichever is the less frequent, to ensure that they are not being worn smooth or otherwise damaged.

(5) If the five consecutive test results of the measurements (for each configuration) show a systematic increase or decrease of more than 10% of the initial reading, then one or more further test runs shall be carried out until a sequence of five are obtained that do not show a systematic increase or decrease of greater than 10%.

13. Revise 8.72.5.2 and 8.72.5.4 to read as follows:

8.72.5.2 While standing, each test subject shall grasp the cylinder so that the wrist creates a straight line with the hand. The elbow is against the side of the body, creating a right angle, throughout the duration of the test and the arm bend creates a right angle.

8.72.5.4 Each test subject shall make five successive attempts to twist the cylinder in the appropriate direction exerting as much force as possible. The range of motion of the subject's arm and wrist shall indicate the end of the twisting cycle. The average maximum force over the five attempts shall be the barehanded control value.

14. Renumber Annex items as follows:

A.5.1.9 in the Annex becomes A.5.1.7.3
A.5.1.10 in the Annex becomes A.5.1.7.4
A.5.1.11 in the Annex becomes A.5.1.7.5

15. Add new Annex items as follows:

A.8.6.16.13 This average should be based on a total of 12 values of percentage shrinkage with four values per specimen.

A.8.6.16.14 This average should be based on a total of 9 values of percentage shrinkage with three values per specimen.
16. Add new Annex Items to read as follows:

**A.8.24.9.10** This average should be based on a total of 12 values of percentage shrinkage with four values per specimen.

**A.8.24.9.11** This average should be based on a total of 9 values of percentage shrinkage with three values per specimen.

**Submitter’s Substantiation:**

1. The ASTM 2412 Standard needs to be updated to the current edition.

2, 3, and 14. The specific requirements for glove labels, which included type of fiber or material type, were inadvertently included in the generic list of requirements for labels on all ensemble elements. Since the majority of fabrics and materials used in construction of many of the ensemble elements contain multiple fibers and numerous blends, even attempting to include this level of detail on every product label would cause mass confusion. The issue becomes even more exacerbated by the minimum font sizes required on label text and by a garment specific label requirement, also included in the generic list, which mandates explicit component names as per the certification listing. This change provides the generic requirements for all labels, and then separates the specific ensemble element label requirements into subsets to avoid any interpretation issues.

4. The NFPA 1971 proposal (1971-46, Log CP-50) neglected to include the test method reference to Section 8.4 as well as the requirement for char length. NFPA 1971, 2013 edition references several flame resistance tests. It is important the standard references the correct flame resistance test and section number to insure the correct testing procedures are being followed. It was also the technical committee’s intent, based on historical data, to have the glove interface component evaluated for char length in addition to afterflame.

5. The NFPA 1971 proposal (1971-46, Log CP-50) neglected to include the test method reference to Section 8.4 as well as the requirement for char length. NFPA 1971, 2013 edition references several flame resistance tests. It is important the standard references the correct flame resistance test and section number to insure the correct testing procedures are being followed. It was also the technical committee’s intent, based on historical data, to have the glove extension component evaluated for char length in addition to afterflame.

6. This change brings this requirement in line with EN ISO 20345:2011.

7. The current laundering method described in Section 8.1.11 only accounts for water levels when laundering garments and CBRN Materials. The 2013 edition of NFPA 1971 now requires gloves and glove pouches to be laundered using Section 8.1.11 as a precondition. However a table for gloves and glove pouch water levels were not included. The water levels for the glove and glove pouch wash cycle needs to be specified in NFPA 1971, 2013 edition in order to allow for the front load wash machines to be properly programmed at the testing laboratories. The highest water levels currently in the standard were chosen to account for usage of both 35 lb and 50 lb capacity front-loading machines. The higher levels will also accommodate a full load of gloves/glove pouches and eliminate any risk associated with residual detergent.

8, 9, 15 and 16. Some changes made to the way the measurement of hood shrinkage were specified in cleaning shrinkage as part of the NFPA 1971-2013 revision would prevent any hood from being certified to the new requirements. There was also an inconsistency between how hood shrinkage was evaluated for both thermal and cleaning shrinkage for the interpretation of test results that would lead to inconsistent determinations of compliance among testing laboratories. The proposed changes using the same approach established in the 2007 edition of NFPA 1971 for applying cleaning shrinkage criteria while clarifications have been made for interpretation of permitted shrinkage in both cleaning and thermal shrinkage test methods.

10. NFPA 1971, 2013 edition has sections for glove pouch construction, sections 8.1.15 and 8.1.16. Section 8.27.8.2, section for Liquid Penetration Resistance, should reference section 8.1.16 for moisture barrier testing.

12. The ISO 13287 standard does not provide criteria for the evaluation of systematic increase or decrease of values. Also, the current calibration language is not clear.

13. The test apparatus will be maxed out if the test subject uses their arm’s range of motion to perform this test. In order to achieve more accurate results it is important the test subject use their wrist’s range of motion to perform this test.

**Emergency Nature:** This TIA seeks to correct errors and omissions that were overlooked during the Fall 2013 revision cycle process of NFPA 1971. Additionally, some parts of this TIA correct circumstances in which the standard could adversely impact a method or product that was inadvertently overlooked in the total revision process.

*Anyone may submit a comment by the closing date indicated above. To submit a comment, please identify the number of the TIA and forward to the Secretary, Standards Council, 1 Batterymarch Park, Quincy, MA 02169-7471.*