



Tentative Interim Amendment

# NFPA<sup>®</sup> 2112

## Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire

2012 Edition

**Reference:** Various

**TIA 12-2**

(SC 13-8-26/TIA Log #1105)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards*, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 2112, *Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire*, 2012 edition. The TIA was processed by the Technical Committee on Flash Fire Protective Garments, and was issued by the Standards Council on August 1, 2013, with an effective date of August 20, 2013.

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 public input 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 3.3.6, A.3.3.6, and 3.3.20, and add a new A.3.3.20 to read as follows:*

**3.3.6\* Cold Weather Insulation Material.** A fabric that consists of one or more nonseparable layers that is used for protection in a low-temperature environment. A cold weather insulation material is not an interlining (see interlining).

**A.3.3.6 Cold Weather Insulation Material.** Examples of insulation materials include textile battings(s) alone or batting(s) that are attached to a face cloth. For example, an insulation material consisting of two layers are considered nonseparable by the attachment that combines the two layers. The insulation material may or may not have a face cloth. Cold weather insulation materials generally are provided within the garment such that their area of coverage coincides with the majority of garment area covering the wearer's body.

Cold weather insulation material as defined in this standard does not preclude the use of intermediate layers for additional protection against thermal hazards.

**3.3.20\* Interlining.** Any textile that is incorporated into any garment as a layer between outer and inner layers that only covers a small portion of the overall garment.

**A.3.3.20 Interlining.** The outer and inner layers are compliant to the fabric requirements of this standard. Examples of an interlining are a fabric layer used to stiffen the waist band in a pair of pants or a facing fabric used inside the closure flap of a coverall. Interlining materials do not come in contact with the wearer's skin or underclothing.

2. *Revise subsections 5.1.2, 5.1.9(7), and 5.1.12, and add a new 5.1.13 to read as follows:*

**5.1.2** At least one product label shall be conspicuously located inside each flame-resistant garment.

**5.1.9(7)** Fiber content for each primary fabric layer including cold weather insulation materials, but excluding interlinings and labels.

**5.1.12** Garments with multiple layers, including an outer layer and removable cold weather insulation layer, shall specify the certified configuration and include a warning on the label stating that all layers must be properly secured and worn in accordance with the manufacturer's instructions.

**5.1.13** For garments with multiple layers that include an outer layer and a removable cold weather insulation layer, a label shall be conspicuously attached to the removable insulation layer that states "DO NOT WEAR THIS LINER BY ITSELF. FOR COMPLIANCE WITH THE FLASH FIRE REQUIREMENTS OF NFPA 2112, THE COMPLETE GARMENT MUST BE WORN. FOR COMPLIANCE INFORMATION, SEE THE PRODUCT LABEL ON OUTER GARMENT."

*3. Add new Section 6.4 and subsections 6.4.1 and A.6.4.1 to read as follows:*

**6.4 Use of a Liner for Cold Weather Insulation.** Garments shall be permitted to include liners in their construction including cold weather insulation materials where the liner is either integral to the garment or removable.

**6.4.1\*** Where garments incorporate a cold weather insulation material as part of a removable lining system, the garment shall be designed such that the removable liner consisting of the cold weather insulation material cannot be independently worn.

**A.6.4.1** Removable liners are permitted to be worn separately if the liner material(s) independently meets the appropriate fabric requirements in Chapter 7 including 7.1.1 for heat transfer performance and 7.1.5 for overall flash fire performance. If the liner contains cold weather insulation materials that are not evaluated to 7.1.1 and 7.1.5 and do not pass the thermal shrinkage resistance requirement in 7.1.3, then the manufacturer must label the liner as specified in 5.1.13 and provide a design that does not allow separate wearing of the liner without the outer layer. This may be demonstrated by the absence of a means of closure for the closure area of shirts, pants, and coveralls.

*4. Add new subsections 7.1.1.1 and 7.1.1.2 to read as follows:*

**7.1.1.1** Where the flame-resistant garment consists of multiple and separable layers intended to be worn separately, the outer layer and the inner layer or layers shall be separately tested.

**7.1.1.2** Where the flame-resistant garment consists of multiple layers intended only to be worn together, only the outer layer shall be tested.

*5. Revise subsections 7.1.2 and 7.1.3 to read as follows:*

**7.1.2** Fabric, cold weather insulation material, and reflective striping utilized in the construction of flame-resistant garments shall be tested for flame resistance as specified in Section 8.3, and shall have a char length of not more than 100 mm (4 in.) and an after-flame of not more than 2 seconds, and shall not melt and drip.

**7.1.3** Fabric utilized in the construction of flame-resistant garments, excluding manufacturer's labels, interlinings, and cold weather insulation materials, shall be individually tested for thermal shrinkage resistance as specified in Section 8.4, and shall not shrink more than 10 percent in any direction.

*6. Delete existing subsection 7.1.3.1.*

*7. Revise subsection 7.1.4 to read as follows:*

**7.1.4** Fabric, cold weather insulation materials, other textile materials, and reflective striping other than those items described in 7.1.4.1 and 7.1.4.2, used in the construction of flame-resistant garments shall be individually tested for heat resistance in their original form as specified in Section 8.4, and shall not melt and drip, separate, or ignite.

*8. Add a new subsection 8.3.1.7 to read as follows:*

**8.3.1.7** Modifications to this test method for testing cold weather insulation materials shall be as specified in 8.3.13.

*9. Revise subsections 8.3.3.1, 8.3.3.2, and 8.3.3.3 to read as follows:*

**8.3.3.1** For fabrics and cold weather insulation materials that are designated on the flame-resistant garment label to be washed, specimens shall be tested before and after 100 cycles of washing and drying as specified in 8.1.3.

**8.3.3.2** For fabrics and cold weather insulation materials that are designated on the flame-resistant garment label to be dry-cleaned, specimens shall be tested before and after 100 cycles of dry cleaning as specified in 8.1.4.

**8.3.3.3** For fabrics and cold weather insulation materials that are designated on the flame-resistant garment label to be either washed or dry-cleaned, specimens shall be tested before and after 100 cycles of washing and drying as specified in 8.1.3, or after 100 cycles of dry cleaning as specified in 8.1.4.

*10. Add new subsections to 8.3.13 to read as follows:*

### **8.3.13 Specific Requirements for Testing Cold Weather Insulation Materials.**

**8.3.13.1** Samples for wash or dry-clean conditioning shall be prepared by cutting a 66-cm × 66-cm (26-in. × 26-in.) panel of the cold weather insulation material. A similar-sized piece of 200-g/m<sup>2</sup> to 270-g/m<sup>2</sup> (6.0-oz/yd<sup>2</sup> to 8.0-oz/yd<sup>2</sup>) flame-resistant fabric meeting all requirements of this standard shall be sewn around the perimeter of the cold weather insulation material such that the batting side is covered by the fabric.

**8.3.13.2** Following wash or dry-clean conditioning, 5 specimens measuring 75 mm × 300 mm (3 in. × 12 in.) from each of the warp and filling direction shall be removed from the cold weather insulation material layer of the conditioned panels.

**8.3.13.3** If applicable, all specimens shall be prepared for testing by trimming the scrim material, batting, or other layer(s) away from the face cloth by 50 mm ± 3 mm (2.0 in. ± 1/8 in.) such that the face cloth can be folded back covering the scrim, batting, or other layer(s) by 50 mm ± 3 mm (2.0 in. ± 1/8 in.); the folded specimen shall be secured in the specimen holder.

**8.3.13.4** Testing shall be performed as described in 8.3.2 through 8.3.7.

*11. Revise subsection 8.4.1 and add new subsections 8.4.1.1 through 8.4.1.5 to read as follows:*

### **8.4.1 Application.**

**8.4.1.1** This test method shall apply to flame-resistant garment fabrics, components, hardware, and cold weather insulation materials.

**8.4.1.2** Modifications to this test method for testing flame-resistant garment textile materials shall be as specified in 8.4.8.

**8.4.1.3** Modifications to this test method for testing other flame-resistant garment materials, including reflective striping, shall be as specified in 8.4.9.

**8.4.1.4** Modifications to this test method for testing hardware shall be as specified in 8.4.10.

**8.4.1.5** Modifications to this test method for testing cold weather insulation materials shall be as specified in 8.4.11.

*12. Revise subsections 8.4.2.1 and 8.4.3.1 through 8.4.3.3 to read as follows:*

**8.4.2.1** Only heat resistance testing shall be conducted on not fewer than three specimens for each hardware item, label material, ~~and~~ other flame-resistant garment fabrics, and cold weather insulation materials not listed in 8.4.2.2 and 8.4.2.3.

**8.4.3.1** For fabrics and cold weather insulation materials that are designated on the flame-resistant garment label to be washed, specimens shall be tested before and after three cycles of washing and drying as specified in 8.1.3.

**8.4.3.2** For fabrics and cold weather insulation materials that are designated on the flame-resistant garment label to be dry-cleaned, specimens shall be tested before and after three cycles of dry-cleaning as specified in 8.1.4.

**8.4.3.3** For fabrics and cold weather insulation materials that are designated on the flame-resistant garment label to be either washed or dry-cleaned, specimens shall be tested before and after three cycles of washing and drying as specified in 8.1.3, after three cycles of dry-cleaning as specified in 8.1.4.

13. Delete existing subsection 8.4.8.2 and renumber 8.4.8.3 to 8.4.8.2 to read as follows:

**8.4.8.2** Testing shall be performed in accordance with 8.4.2 through 8.4.7.

14. Add new subsection 8.4.11 to read as follows:

**8.4.11 Specific Requirements for Testing Cold Weather Insulation Materials.**

**8.4.11.1** Samples for wash or dry-clean conditioning shall be prepared by cutting a 50-cm × 20-cm (20-in. × 8-in.) panel of the cold weather insulation material. A similar-sized cloth piece of 200-g/m<sup>2</sup> to 270-g/m<sup>2</sup> (6.0-oz/yd<sup>2</sup> to 8.0-oz/yd<sup>2</sup>) flame-resistant fabric meeting all requirements of this standard shall be sewn around the perimeter of the cold weather insulation material such that the batting side is covered by the fabric .

**8.4.11.2** Following wash or dry-clean conditioning, 3 specimens measuring 152 mm × 152 mm (6 in. × 6 in.) shall be removed from the cold weather insulation material layer of the conditioned panel.

**8.4.11.3** Testing shall be performed in accordance with 8.4.2 through 8.4.7, and thermal shrinkage shall not be measured.

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**Effective Date:** August 20, 2013

(Note: For further information on NFPA Codes and Standards, please see <http://www.nfpa.org/docinfo>)

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