

NFPA 2112-2018 Edition

Standard on Flame-Resistant Clothing for Protection of Industrial Personnel Against Short-Duration Thermal Exposures from Fire

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www.nfpa.org/2112

1. Revise specific paragraphs in Chapter 1 to read as follows:

1.1 Scope. The standard shall specify the minimum design, performance, testing, and certification requirements and test methods for flame-resistant garments, shrouds/hoods/balaclavas, ~~and~~ gloves, and cloth face coverings for use in areas at risk from short-duration thermal exposure from fire.

1.2.1* This standard shall provide minimum requirements for the design, construction, evaluation, and certification of flame-resistant garments, shrouds/hoods/balaclavas, ~~and~~ gloves, and cloth face coverings for use by industrial personnel, with the intent of not contributing to the burn injury of the wearer, providing a degree of protection to the wearer, and reducing the severity of burn injuries resulting during egress from or accidental exposure to short-duration thermal exposure from fire.

1.3.1 This standard shall apply to the design, manufacturing, and certification of new flame-resistant garments, shrouds/hoods/balaclavas, and gloves and the design and manufacturing of new cloth face coverings.

1.3.4 The requirements of this standard shall not apply to accessories that might be attached to flame-resistant garments, shrouds/hoods/balaclavas, ~~or~~ gloves, or cloth face coverings unless specifically addressed herein.

1.4 Retroactivity. This standard shall apply only to garments, shrouds/hoods/balaclavas, ~~or~~ gloves, or cloth face coverings manufactured on or after the effective date of the standard.

2. Add new definition for cloth face covering, and associated annex item to read as follows:

3.3.X* Cloth Face Covering. An item of clothing, primarily covering the nose and mouth, designed to reduce the community spread of bioaerosols.

A.3.3.X Cloth Face Covering. Cloth face coverings are not shrouds/hoods/balaclavas because they are not designed to provide primary thermal protection to the wearer's head or neck, or both. Cloth face coverings provide primary thermal protection to the nose and mouth that is consistent with the performance levels that are applied for shrouds/hoods/balaclavas. These clothing items are primarily intended to attenuate the volume of bioaerosols that are exhaled or released during coughing and sneezing by the individual wearer to aid in lessening the transmission of airborne pathogens such as SARS-CoV-2, the virus responsible for COVID-19. These clothing items are not protective masks or medical masks and are not evaluated for their protective performance in accordance with this standard.

The selection of materials used in the construction of cloth face coverings should account for the ability of the material to filter bioaerosols and to offer levels of acceptable breathing resistance. Materials that are very porous can have low efficiencies to prevent the passage of

bioaerosols while tightly woven fabrics or multiple layers of fabrics could create resistance to breathing that forces the passage of inhaled and exhaled air around the edges of the cloth face covering rather than through the material. Useful measurements of bioaerosol filtration performance is performed in accordance with ASTM F2101, *Standard Test Method for Evaluating the Bacterial Filtration Efficiency (BFE) of Medical Face Mask Materials, Using a Biological Aerosol of Staphylococcus aureus*. The measurement of breathing resistance is can performed in accordance with Annex C of EN 14683, *Medical face masks—Requirements and test methods*. It is important to note that measurement of cloth face covering performance in accordance with these test methods do not connote that these clothing items are protective masks or medical masks but instead provide useful benchmarks for relevant areas of performance.

3. Add new reference in Chapter 2 to read as follows:

2.3.X ISEA Publications. International Safety Equipment Association, 1901 North Moore Street, Suite #808, Arlington, VA 22209-1762.

ANSI/ISEA 125, *American National Standard for Conformity Assessment of Safety and Personal Protective Equipment*, 2014.

4. Revise definitions in 3.3.27 and 3.3.35, and add associated annex items to read as follows:

3.3.27* Product. The compliant flame-resistant garment, shrouds/hoods/balaclavas, or gloves.

A.3.3.27 Product. Cloth face coverings are intentionally omitted from the definition of product because they are exempt from many requirements that are imposed on products throughout this standard.

3.3.35* Shroud/Hood/Balaclava. An item of clothing designed to provide protection to the wearer's head or neck, or both, less the face opening.

A.3.3.35 Shroud/Hood/Balaclava. Shrouds/hoods/balaclavas that incorporate mouth and nose coverage that is intended to provide primary thermal protection are still to be considered as shrouds/hoods/balaclavas and not cloth face coverings.

5. Revise/add new specific paragraphs in Chapter 4, and add associated annex items to read as follows:

4.1.1* All flame-resistant garments, shrouds/hoods/balaclavas, and gloves that are labeled as being compliant with this standard shall meet or exceed all applicable requirements specified in this standard and shall be certified.

A.4.1.1 Cloth face coverings are intentionally omitted from several sections pertaining to certification because they are not intended to be certified products. Where applicable, certain language around compliance and components might include reference to cloth face coverings.

4.1.1.1 All flame-resistant cloth face coverings that are labeled as compliant with this standard shall be constructed of compliant components that meet or exceed all applicable requirements specified in this standard and in Chapter 4 with the following exceptions:

(1) Certification program requirements in Section 4.2 shall not apply to flame-resistant cloth face coverings.

(2) Inspection and testing requirements in Section 4.3 shall not apply to flame-resistant cloth face coverings.

(3) Manufacturer quality assurance program requirements for third-party audits shall not apply to flame-resistant cloth face coverings.

4.1.1.2* All flame-resistant cloth face coverings that are labeled as compliant with this standard shall be constructed of compliant components that meet the Level 2 conformity assessment requirements specified in Chapter 7 of ANSI/ISEA 125, *American National Standard for Conformity Assessment of Safety and Personal Protective Equipment*, with the exception of paragraph 7.1.

A.4.1.1.2 Given the nature of the flame-resistant cloth face coverings and their intended widespread use for national health emergencies including pandemics, the conformity assessment approach applied for this clothing is a self-declaration in accordance with the criteria established in ANSI/ISEA 125, *American National Standard for Conformity Assessment of Safety and Personal Protective Equipment*, that includes conformance testing, corrective and preventive actions, recordkeeping, and the supplier's Declaration of Conformity.

4.1.2 All test data used to determine compliance of flame-resistant garments, shrouds/hoods/balaclavas, ~~and~~ gloves, and cloth face coverings with this standard shall be provided by an accredited testing laboratory.

4.1.3.1 All flame-resistant cloth face coverings shall be labeled.

4.1.4.1 All flame-resistant cloth face coverings shall have a label that meets the requirements of Section 5.1.

6. *Revise/add new specific paragraphs in Chapter 5, and add associated annex items to read as follows:*

5.1.1.1* All flame-resistant cloth face coverings shall have a label or labels permanently and conspicuously attached to each flame-resistant cloth face covering.

A.5.1.1.1 By definition, cloth face coverings are excluded from product requirements and are exempted from many product label requirements. Therefore, they should have a label as opposed to a product label.

5.1.4.1 Flame-resistant cloth face coverings shall be exempt from the requirements of 5.1.4.

5.1.5 All worded portions of the required label or product label shall be printed in English. Supplementary languages, in addition to English, shall be permitted.

5.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement worded statements on the label or product label ~~or labels~~.

5.1.8.1 The following statement shall be printed legibly on the flame-resistant cloth face covering label in letters at least 2.5 mm (0.10 in.) high:

THIS CLOTH FACE COVERING MEETS THE
REQUIREMENTS OF NFPA 2112-2018.

5.1.9.1* At a minimum, the following information shall also be printed legibly on the flame-resistant cloth face covering label in letters at least 1.6 mm (0.063 in.) high:

- (1) Model name, number, or design
- (2) Manufacturer's name, identification, or designation

(3) Manufacturer's garment identification number, lot number, or serial number

(4) "DO NOT REMOVE"

A.5.1.9.1 The reduced minimum label information for flame-resistant cloth face coverings is intended to minimize the size of the label relative to the inherently small size of the item. Additional label information is permitted if requested by the end-user.

7. *Revise title of section 6.1 to read as follows:*

6.1 Garments, Shrouds/Hoods/Balaclavas, ~~and Gloves,~~ and Cloth Face Coverings.

8. *Revise paragraph 7.4 and add new paragraph 7.4.1 to read as follows:*

7.4 Label Requirement. Specimen labels used in the construction of flame-resistant ~~clothing items~~ garments, shrouds/hoods/balaclavas, and gloves shall be tested, as specified in Section 8.7, for printing durability and shall remain legible and in place.

7.4.1 Specimen labels used in the construction of flame-resistant cloth face coverings shall be exempt from the requirements of Section 7.4.

9. *Add new section 7.7 addressing performance requirements for cloth face coverings to read as follows:*

7.7 Cloth Face Covering Requirements.

7.7.1 Fabric components used in the construction of cloth face coverings shall be compliant with all fabric requirements in Section 7.1.

7.7.2 Sewing thread components used in the construction of cloth face coverings shall be compliant with the thread requirements in Section 7.2.

7.7.3 Hardware components used in the construction of cloth face coverings shall be compliant with the hardware requirements in Section 7.3.

10. *Revise specific paragraphs in Chapter 8 to read as follows:*

8.2.1 Application. This test method shall apply to flame-resistant garment, shroud/hood/balaclava, ~~and glove,~~ and cloth face covering fabrics.

8.2.2.1 HTP testing shall be conducted on six specimens — three in the spaced configuration and three in the contact configuration — measuring 150 mm ± 5 mm × 150 mm ± 5 mm (6 in. ± 1/4 in. × 6 in. ± 1/4 in.) and shall consist of all layers representative of the garment, shroud/hood/balaclava, ~~and glove,~~ and cloth face covering to be tested.

8.2.2.2 Specimens shall consist of all layers used in the construction of the flame-resistant garment, shroud/hood/balaclava, ~~and glove,~~ and cloth face covering excluding any areas with special reinforcements.

8.2.3 Sample Preparation.

8.2.3.1 For fabrics that are designated on the flame-resistant garment, shroud/hood/balaclava, ~~and glove,~~ and cloth face covering labels to be washed, specimens shall be tested before and after three cycles of washing and drying as specified in 8.1.3.

8.2.3.2 For fabrics that are designated on the flame-resistant garment, shroud/hood/balaclava, ~~and glove,~~ and cloth face covering labels to be dry-cleaned, specimens shall be tested before and after three cycles of dry cleaning as specified in 8.1.4.

8.2.3.3 For fabrics that are designated on the flame-resistant garment, shroud/hood/balaclava, ~~and~~ glove, and cloth face covering labels 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, or after three cycles of dry cleaning as specified in 8.1.4.

8.3.1.1 This test method shall apply to each flame-resistant garment, ~~and~~ shroud/hood/balaclava, and cloth face covering fabric layer.

8.3.3.1 For fabrics, cold weather insulation materials, ~~and~~ shroud/hood/balaclava, and cloth face covering materials that are designated on the product 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, cold weather insulation materials, ~~and~~ shroud/hood/balaclava, and cloth face covering materials that are designated on the product 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, cold weather insulation materials, ~~and~~ shroud/hood/balaclava, and cloth face covering materials that are designated on the product 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 before and after 100 cycles of dry cleaning as specified in 8.1.4.

8.4.1.1 This test method shall apply to flame-resistant garment, shroud/hood/balaclava, ~~and~~ glove, and cloth face covering components, hardware, and cold weather insulation materials.

8.4.2.2 Both heat and thermal shrinkage resistance testing shall be conducted on a minimum of three specimens for each flame-resistant garment, ~~and~~ shroud/hood/balaclava, and cloth face covering fabric.

8.4.3.1 For fabrics, cold weather insulation materials, ~~and~~ shroud/hood/balaclava materials, and cloth face covering fabrics that are designated on the product 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, cold weather insulation materials, ~~and~~ shroud/hood/balaclava materials, and cloth face covering fabrics that are designated on the product 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, cold weather insulation materials, ~~and~~ shroud/hood/balaclava materials, and cloth face covering fabrics that are designated on the product 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, or before and after three cycles of dry cleaning as specified in 8.1.4.

8.4.9 Specific Requirements for Testing Other Flame-Resistant Garments ~~and~~, Shroud/Hood/Balaclava, Cloth Face Coverings, and Materials (Including Reflective Striping).

8.6.1 Application. The thread heat resistance test method shall apply to each type of thread used in the construction of the flame-resistant garment, shroud/hood/balaclava, ~~and gloves,~~ and cloth face coverings other than embroidery.

11. Add the following new references to Annex C to read as follows:

C.1.2.X ASTM Publications. ...

ASTM F2101, Standard Test Method for Evaluating the Bacterial Filtration Efficiency (BFE) of Medical Face Mask Materials, Using a Biological Aerosol of Staphylococcus aureus, 2019.

C.1.2.X CENELEC Publications. CENELEC, European Committee for Electrotechnical Standardization, CEN-CENELEC Management Centre, Avenue Marnix 17, 4th Floor, B-1000 Brussels, Belgium.

EN 14683, Medical face masks—Requirements and test methods, 2019.

C.1.2.X ISEA Publications. International Safety Equipment Association, 1901 North Moore Street, Suite #808, Arlington, VA 22209-1762.

ANSI/ISEA 125, American National Standard for Conformity Assessment of Safety and Personal Protective Equipment, 2014.

Substantiation: The current COVID-19 pandemic is changing how the workplace operates. Given the need for industrial workers to potentially wear masks in the performance of their duties as dictated by Federal, state, or local authorities, or as mandated by the organization or employer, it is important the wearing of such masks not contribute to worker hazards faced as part of their normal occupational tasks. The inclusion of flame-resistant cloth face covering is intended to aid in the safe wearing of masks under the circumstances of a national health emergency that includes pandemics involving airborne pathogens. The specific requirements have been written to apply the same criteria that are normally established for shrouds, hoods, and balaclavas. To enable the rapid dissemination of these products, self-declaration is specified in lieu of third party certification but with specific caveats associated for ensuring a high level of data quality by the use of laboratories accredited to ISO 17025 for this testing in addition to other conformity assessment requirements specified in a separate industry standard.

Emergency Nature: 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.

Anyone may submit a comment by the closing date indicated above. Please identify the TIA number and forward to the Secretary, Standards Council. [SUBMIT A COMMENT](#)