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American National Standard for High-Visibility Safety Apparel And Accessories

ANSI/ISEA 107-2015
(REVISION OF ANSI/ISEA 107-2010)

**American National Standard for
High-Visibility Safety Apparel and Accessories**

Secretariat
International Safety Equipment Association

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American National Standards Institute, Inc.

**American
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Standard**

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Foreword

(This Foreword is not part of American National Standard ANSI/ISEA 107-2015)

ANSI/ISEA 107-2015 is latest revision of a voluntary industry consensus standard that was first published in 1999 and revised in 2004 and 2010. Prior to its initial publication there was no regulation or guideline for the design, performance or materials for high visibility PPE in the United States. Since 1999, the standard has been recognized by federal, state and local authorities as well as private industry. Current US Department of Transportation, Federal Highway Administration (FHWA) regulations have required workers on or near Federal-aid highways to wear Class 2 or Class 3 garments, and the 2009 revision to the Manual on Uniform Traffic Control Devices (MUTCD) extends this provision to workers on all roadways in the United States.

The need to be seen is recognized as a critical issue for worker safety. Low visibility is a serious hazard for all workers who must perform tasks near moving vehicles or equipment. Workers must be visible to vehicle operators in all lighting conditions and against complex environmental backgrounds. The sooner a vehicle operator sees a pedestrian worker, the longer the operator has to avoid an incident. High visibility safety apparel and accessories dramatically enhance worker visibility.

This new edition consolidates the requirements of ANSI/ISEA 107-2010 and ANSI/ISEA 207, *American National Standard for Public Safety Vests* in an effort to establish a single, comprehensive document that considers all occupational tasks. While the standard continues to present three performance classes of garments based on the amount of visible materials and design attributes incorporated into the final configuration, it also identifies garment types based on expected use settings and work activities being performed. These are designated as off-road (type O), roadway and temporary traffic control (type R), or public safety activities (type P).

Fit and comfort of high-visibility safety apparel play an important role in worker acceptance of wearing these items as part of their daily activity. While previous editions provided some freedom in design that resulted in smaller sized garments capable of meeting the standard's requirements, specifiers and users wearing garments classified as Performance Class 2 under the ANSI/ISEA 107-2010 standard edition had expressed concern regarding appropriately fitting compliant garments for smaller sized workers. Garments that are not properly sized to fit can expose workers to catch hazards or interfere with other protective gear, potentially compromising worker safety.

In response, the ANSI/ISEA 107-2015 standard edition now includes provisions for Type R Performance Class 2 and Performance Class 3 garments in the smallest size offered to utilize a reduced amount of background material to allow for sizing more appropriate for smaller workers. It is stressed that these reduced amounts are intended to address the smaller sized workers' needs specifically, that only the smallest size offered for any one garment be allowed to deviate from the stated minimum and that the resulting configuration using these amounts be consistent with the other sizes for that particular garment.

Additionally and in recognizing the growing use of high-visibility accessory items such as arm bands or headwear, the standard defines minimum material requirements for these accessories. New labeling requirements will identify the garment by performance class, type and by its flame resistance characteristics as defined in the standard. ANSI/ISEA 107-2015 also expands the examples of garment configurations to illustrate compliant and non-compliant designs.

This revision was prepared by members of the High Visibility Products Group of the International Safety Equipment Association (ISEA). The following companies were members of the group at the time of the approval of the standard:

511 Tactical Series	MSA Safety
Arcwear.com	NASCO Industries
Blauer Manufacturing	National Safety Apparel
ERB Industries	OccuNomix International
Ergodyne	ORAFOL Americas, Inc.
Honeywell Safety Products	Pacific Safety Supply
Kimberly-Clark Corporation	Performance Textiles, Inc. (div. of Brand and Oppenheimer)
M.L. Kishigo Manufacturing	Protective Industrial Products
Lakeland Industries	Radians, Inc.
3M Company	Safe Reflections
MCR Safety	Tingley Rubber
	Vartest Laboratories

This standard was processed and approved using consensus procedures prescribed by the American National Standards Institute. The following organizations were contacted prior to the approval of this standard. Inclusion in this list does not necessarily imply that the organization concurred with the submittal of the proposed standard to ANSI.

American Contractors Insurance Group	Liberty Ambulance Services
Atlas Industrial Contractors	Michigan Department of Transportation
Cintas Corporation	Ms. Sharon Morales, CSP
City of Hillsboro	National Safety Apparel
Colorado Department of Transportation	Oldcastle Materials
Daoming Optics and Chemical	Performance Textiles
Denton Companies	Power Consultants Inc.
E&B Pavings	Reflective Apparel Factory
Emergency Responders Safety Institute	Rugged Safety
Fairfax County Government	Safety Priority Consultants
Federal Aviation Administration	SGS Consumer Testing Services
Federal Highway Administration	State of Ohio Public Employment Risk Reduction Program
Fruitport Township Police Department	Syracuse Utilities
Glen Raven Technical Fabrics	U.S. Department of Labor – OSHA
Golder Associates, Inc.	Zurich Services Corporation
Hensel Phelps	
International Association of Chiefs of Police	
Laborers' Health and Safety Fund of North America	

Suggestions for the improvement of this standard are welcome. Send suggestions to:

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American National Standard for High-Visibility Safety Apparel and Accessories

1 Scope

This standard specifies performance requirements for high-visibility safety apparel and accessory PPE. For the purpose of this standard, the term “high-visibility safety apparel (HVSA)” shall be used to mean apparel and accessory PPE intended to provide conspicuity to the user in hazardous situations under any light conditions by day and under illumination by vehicle headlights in the dark or other low light conditions.

Performance requirements are included for color, retroreflection, and minimum areas of retroreflective and combined-performance materials, as well as the recommended configuration of the materials. Performance requirements are also provided for the color, physical properties, and minimum areas of background materials used in the construction of HVSA and accessories. Test methods are provided in the standard to ensure that a minimum level of visibility is maintained when garments are subjected to ongoing care procedures. These specifications may prescribe a wide variety of occupational HVSA, but shall not be applied to firefighter turnout gear.

2 Purpose

Conspicuity is enhanced by high contrast between the garment and the ambient background against which it is seen. This standard provides performance requirements for conspicuous materials to be used in HVSA and specifies minimum amounts of background, retroreflective and combined-performance materials, colors and placement of materials for garments, supplemental items and accessory items used to enhance the visibility and safety of workers. Performance Class guidelines are identified with corresponding recommendations for selection based on worker risk hazards, such as complex backgrounds, vehicular traffic and speeds encountered.

3 Definitions

Accredited laboratory: A laboratory having a certificate of accreditation meeting the requirements ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories* for the collection and analysis of data within the parameters of this standard.

Background material: Colored fluorescent material intended to be highly conspicuous, but not intended to comply with the requirements of this standard for retroreflective material.

Band: A strip or stripe that contrasts with the adjacent material in color, texture, material or function.

Combined-performance material: A retroreflective material that is also a fluorescent material.

Conspicuity: The characteristics of an object influencing the probability that it will come to the attention of an observer, especially in a complex environment which has competing objects.

Declaration of conformity: A statement by the manufacturer or supplier, based on a decision following review, that fulfillment of the requirements specified in this standard has been demonstrated. (Appendix D3)

Flame resistance: The property of a material whereby flaming combustion is prevented, terminated or inhibited following application of a flaming or non-flaming source of ignition with or without subsequent removal of the ignition source.

Fluorescent material: Material that instantaneously emits optical radiation within the visible range at wavelengths longer than absorbed and for which emission ceases upon removal of the source of irradiation. These materials enhance daytime visibility, especially during dawn and dusk.

Gaiters: High-visibility safety apparel covering the lower leg above the ankle to mid-calf or knee.

High-visibility accessory: A high-visibility item or items that can help define the human form and, when combined with movement, enhance nighttime conspicuity.

NOTE: Items such as headwear, hoods (attached or detachable), gloves, suspenders and arm and leg bands that incorporate compliant background and retroreflective or combined-performance materials are considered accessories. For purposes of this standard, the term “headwear” does not apply to industrial head protection devices offering impact, penetration and electrical protection as defined in ANSI/ISEA Z89.1, *American National Standard for Industrial Head Protection*.

High-visibility safety apparel (HVSA):

Personal protective safety clothing intended to provide conspicuity during both daytime, nighttime and other low-light condition usage.

Pants: Apparel designed to cover the body from at least the waist to the ankle, divided into sections to encircle each leg separately.

Photometric performance: The effectiveness of retroreflective material in returning light to its source and measured in terms of coefficient of retroreflection.

NOTE: The photometric terms and definitions used in this document are defined in ASTM E284-13b and ASTM E808-01 (2009).

PPE: Personal Protective Equipment

Retroreflective material: Material that reflects and returns a relatively high proportion of light in a direction close to the direction from which it came.

Roadway: A general term for denoting a strip of land that has been improved, designed, or is ordinarily used for the purposes of vehicular travel.

Shorts: Apparel designed to cover the body from the waist to the knees, divided into sections to encircle each leg separately.

Shoulder area: The area of an item of apparel that lies above a horizontal plane located 15 cm (5.9 inches) below the shoulder high-point, as measured along the HVSA. See Figure 1.

Split-trim: Retroreflective or combined-performance materials consisting of minimum widths positioned as a parallel pair.

Temporary traffic control (TTTC) zone: An area of highway where road user conditions are changed because of a work zone or incident by the use of temporary traffic control devices, flaggers, uniformed law enforcement officers, or other authorized personnel.

Water repellent: The characteristic of a fabric to resist wetting.

Water resistant: The characteristic of fabric to resist wetting and penetration by water.

Waterproof: The resistance of a fabric to the penetration of water under pressure.

4. Compliance

4.1 Background Materials

Fluorescent background materials shall be tested by an ISO/IEC 17025 accredited laboratory to verify performance to the requirements specified in this standard. At a minimum, the information found on the form in Appendix D1 shall be provided.

4.2 Combined-Performance and Retroreflective Materials

Combined-performance and retroreflective materials shall be tested by an ISO/IEC 17025 accredited laboratory to verify performance to the requirements specified in this standard. At a minimum, the information found on the form in Appendix D2 shall be provided.

4.3 Finished HVSA

Manufacturers of the finished HVSA shall verify that materials and supplies used to make HVSA meet the requirements of this standard.

All certificates and test reports that verify the performance of materials used in manufacturing the finished HVSA shall be retained by the manufacturer and be made available to ensure that all HVSA labeled as meeting this standard have completed all of the testing required by the standard.

Manufacturers of the finished HVSA shall provide a declaration of conformity that all requirements for the HVSA are achieved in their entirety. The Declaration of Conformity shall be developed for all models produced by each

company. At a minimum, the information found on the form in Appendix D3 shall be provided.

NOTE: Appendix D contains examples of forms to be used for testing combined-performance and retroreflective materials and background materials, and includes an example of a Declaration of Conformity. All forms are available for download in Adobe Acrobat format on www.safetyequipment.org.

4.4 Declaration of Conformity

The issuer of the declaration of conformity shall have procedures in place to ensure the continued conformity of the product, as delivered or accepted, with the stated requirements of the declaration of conformity. The issuer of the declaration of conformity shall have procedures in place to re-evaluate the validity of the declaration of conformity, in the event of:

- a. changes significantly affecting the design or specification of the product;
- b. changes in the standards to which conformity of the product is stated;
- c. changes in the ownership or structure of the supplier, if relevant; or
- d. relevant information indicating that the product may no longer conform to the specified requirements.

5 Types and Classes

5.1 HVSA Types

High-visibility garment types are designated by the work environment in which the wearer is performing a task.

Apparel includes, but is not limited to, clothing such as vests, jackets, pants, shirts, rainwear and coveralls.

5.1.1 Type O (“off-road”) – Occupational HVSA for Non-Roadway Use

Type O HVSA provides daytime and nighttime visual conspicuity enhancement for workers in occupational environments which pose struck-by hazards from moving vehicles, equipment and machinery, but which will not include exposure to traffic on public access highway rights-of-way or roadway temporary traffic control (TTC) zones.

5.1.2 Type R (“roadway”) – Occupational HVSA for Roadway Use

Type R HVSA provides daytime and nighttime visual conspicuity enhancement for workers in occupational environments which include exposure to traffic (vehicles using the highway for purposes of travel) from public access highway rights-of-way, or roadway temporary traffic control (TTC) zones or from work vehicles and construction equipment within a roadway temporary traffic control (TTC) zone.

5.1.3 Type P (“public safety”) – Occupational HVSA for Emergency and Incident Responders and Law Enforcement Personnel

Type P HVSA provide daytime and nighttime visual conspicuity enhancement for emergency and incident responders and law enforcement personnel in occupational environments which include exposure to traffic (vehicles using the highway for purposes of travel) from public access highway rights-of-way, or roadway temporary traffic control (TTC) zones, or from work vehicles and construction equipment within a roadway temporary traffic control (TTC) zone or from equipment and vehicles within the activity area. Type P HVSA provides additional options for emergency responders, incident responders and law enforcement who have competing hazards or require access to special equipment.

5.2 Performance Classes

Performance Classes present within each type of high-visibility safety apparel are specified in terms of the minimum area of high-visibility materials to be incorporated. Performance Classes provide a range of design options corresponding with the needs of the user in the expected risk environment. Type O includes one Performance Class and Type R and Type P each have two Performance Classes.

5.2.1 Performance Class 1 (Type O)

Performance Class 1 provides the minimum amount of high-visibility materials required to differentiate the wearer visually from non-complex work environments, in scenarios in which the struck-by hazards will not be approaching at roadway speeds, and therefore operative detection and identification distances

in the work environment can be shorter than in other situations without compromising safety.

5.2.2 Performance Class 2 (Type R or P)

Performance Class 2 provides for the use of additional amounts of high-visibility materials, which may allow design opportunities to define the human form more effectively. Performance Class 2 HVSA have the potential to provide longer detection and identification distances, and increased conspicuity performance compared to Performance Class 1 HVSA.

NOTE: Performance Class 2 HVSA is considered a minimum practice for HVSA in roadway rights-of-way and temporary traffic control (TTC) zones, as required in the 2009 edition of the MUTCD.

5.2.3 Performance Class 3 (Type R or P)

Performance Class 3 can offer greater visibility to the wearer in both complex backgrounds and through a full range of body movements by mandatory placement of background, retroreflective and combined-performance materials on sleeves and pant legs (if present). Regardless of the area of materials used, a sleeveless garment or vest alone shall not be considered Performance Class 3.

5.3 Supplemental Class E

Pants, bib overalls, shorts, and gaiters shall be designated Class E. Class E items shall not be worn alone for the purposes of meeting HVSA PPE requirements. When a Class E item is worn with Performance Class 2 or Class 3, the overall classification shall be Performance Class 3.

5.4 Optional High-Visibility Accessories

High-visibility accessories are not intended to be used alone as personal protective equipment against struck-by hazards and such items shall not contribute to the minimum areas of visible materials of the HVSA.

6. Design

6.1 Ergonomics

High-visibility safety apparel and accessories should be designed and manufactured taking into account the following considerations:

- a. The materials and components of the garment should not be known to affect the wearer adversely.
- b. Parts of the garment that come into contact with the end user should be free of roughness, sharp edges and projections that could cause irritation or injuries.
- c. The garment should be designed for correct fit and positioning on the user and should be designed to ensure that it remains in place for the expected period of use, anticipating environmental factors as well as movements the wearer could adopt during the course of work.

6.2 Apparel Configurations (Refer to Appendix C for examples)

6.2.1 General

HVSA shall incorporate the minimum areas of materials specified in Table 1.

Accessories shall incorporate the minimum areas of materials specified in Table 2.

HVSA shall be designed to permit maximum visibility of the wearer. The most effective deployment of high-visibility materials on a garment is distribution at the ends of the limbs to mark the human form and accentuate human motion.

6.2.2 Type O HVSA

Type O Class 1 HVSA shall utilize at least one horizontal band of retroreflective or combined-performance material around the torso, and shall include at least the minimum amounts of retroreflective or combined-performance material in the shoulder area if encircling bands are not present on sleeves.

Table 1. Minimum Areas of Visible Materials

Garment Type	Performance Class	Background Material	Retroreflective or Combined-Performance Materials	Minimum Width Reflective Material
Type O Off-road and Non-Roadway Use	Class 1	0.14 m ² (217 in ²)	0.10 m ² (155 in ²)	25 mm (1 in.)
Type R Roadway and Temporary Traffic Control Zones	Class 2*	0.50 m ² (775 in ²)	0.13 m ² (201 in ²)	25 mm (1 in.) ^{##} 35 mm (1.38 in.)
	Class 3**	0.80 m ² (1240 in ²)	0.20 m ² (310 in ²)	25 mm (1 in.) ^{##} 50 mm (2 in.)
*For the smallest size offered in Type R, Performance Class 2, a minimum of 0.35 m² (540 in²) of background material may be used to accommodate small-sized workers. All subsequent larger sizes must use 0.50 m² (775 in²). **For the smallest size offered in Type R, Performance Class 3, a minimum of 0.65 m² (1000 in²) of background material may be used to accommodate small-sized workers. All subsequent larger sizes must use 0.80 m² (1240 in²).				
Type P Emergency and Incident Responders and Law Enforcement Personnel	Class 2	0.29 m ² (450 in ²)	0.13 m ² (201 in ²)	25 mm (1 in.) ^{##} 50 mm (2 in.)
	Class 3	0.50 m ² (775 in ²)	0.20 m ² (310 in ²)	25 mm (1 in.) ^{##} 50 mm (2 in.)
Supplemental Items[#] Pants, Overalls, Shorts, Rain Pants and Gaiters	Class E	0.30 m ² (465 in ²)	0.07 m ² (109 in ²)	25 mm (1 in.) ^{##} 50 mm (2 in.)
[#] When a Supplemental Class E item is worn with Performance Class 2 or 3, the overall classification for the ensemble shall be Performance Class 3. ^{##} For use with split-trim designs (See Section 6.3.1.2) NOTE: Combined-performance materials can be counted toward the minimum area requirements for background material specified in Table 1.				

Table 2. Minimum area of visible materials of optional high-visibility accessories

Accessory	Background Material^{##}	Retroreflective or Combined-Performance Materials^{##}	Minimum Width Reflective Material
Gloves	0.0065 m ² (10 in ²)	0.0065 m ² (10 in ²)	25 mm (1 in.)
Arm or leg bands	0.015 m ² (24 in ²)	0.015 m ² (24 in ²)	25 mm (1 in.)
Headwear, hoods (attached or detachable)	0.05 m ² (78 in ²)	0.0065 m ² (10 in ²)	25 mm (1 in.)
^{##} For gloves, arms or leg bands, the minimum area of visible background material and retroreflective or combined-performance material shall be divided such that one half is on each individual item. For example, a pair of gloves would have 0.00325 m ² (5 in ²) of visible background material and 0.00325 m ² (5 in ²) of retroreflective or combined-performance material on each individual glove.			

Harnesses meeting requirements for Type O HVSA are permissible.

NOTE: Harnesses complying with this standard are not intended to provide protection against fall from heights.

6.2.3 Type R HVSA

6.2.3.1 Type R Class 2

Type R Class 2 HVSA shall utilize at least one horizontal band of retroreflective or combined-performance material around the torso, and shall include at least the minimum amounts of retroreflective or combined-performance material in the shoulder area if encircling bands are not present on sleeves.

6.2.3.2 Type R Class 3

Type R Class 3 HVSA shall utilize one or more horizontal bands of retroreflective or combined-performance material around the torso, and shall include one or more encircling bands on the sleeves.

6.2.4 Type P HVSA

6.2.4.1 Type P Class 2

Type P Class 2 HVSA shall utilize at least one horizontal band of retroreflective or combined-performance material around the torso, and shall include at least the minimum amounts of retroreflective or combined-performance

material in the shoulder area if encircling bands are not present on sleeves.

6.2.4.2 Type P Class 3

Type P Class 3 HVSA shall utilize at least one horizontal band of retroreflective or combined-performance material around the torso, and shall include one or more encircling bands on the sleeves.

6.3 Construction Requirements

6.3.1 Retroreflective and Combined-Performance Materials

6.3.1.1 Minimum Widths

The width of the retroreflective or combined-performance materials incorporated into the HVSA shall not be less than the dimensions specified in Table 1.

6.3.1.2 Split-trim designs

Retroreflective or combined-performance material may be utilized in a split-trim design. The split-trim design shall consist of two stripes of retroreflective or combined-performance material with minimum width of 25 mm (1 in.) that are positioned as a parallel pair on compliant fluorescent background material of the same or contrasting color, or on a non-compliant material of any color. The two paired stripes of retroreflective or combined-performance

material shall not be separated by more than 50 mm (1.97 in.).

6.3.1.3 Spacing between Multiple Bands

Whenever multiple bands are placed on the HVSA, the minimum distance between bands of retroreflective or combined-performance material shall be at least equal to the width of the band.

6.3.2 Placement of Retroreflective and Combined-Performance Materials

6.3.2.1 Distance from Bottom Edge of HVSA

Horizontal retroreflective or combined-performance materials shall be placed at least 50 mm (1.97 in.) above the bottom of the hem of the torso, long sleeve and long pant HVSA styles.

6.3.2.2 Encircling Arms and Legs

Horizontal retroreflective or combined-performance materials placed on arms or legs shall encircle them in such a manner to provide 360° visibility of the wearer at all viewing angles in a horizontal plane.

6.3.2.3 Long Sleeves

If upper bands of retroreflective or combined-performance materials are placed on long sleeves, the bands shall be placed between the elbow and the shoulder. Lower bands can be placed between the elbow and wrist but shall be at least 50 mm (1.97 in.) above the bottom of the sleeve.

6.3.3 Gaps

Gaps in retroreflective, combined-performance, and background materials shall not be more than 50 mm (1.97 in.) horizontally to enable fastening or for seam allowance.

Retroreflective or combined-performance materials shall not count against the width of this gap.

6.3.4 360° Visibility

Retroreflective or combined-performance and background materials for all garment types and performance classes and headwear shall be positioned on items in such a way as to provide

360° visibility of the wearer at all viewing angles in a horizontal plane.

High-visibility materials on accessory items shall be positioned to maximize outward visibility, with the understanding that 360° visibility may not be possible with some designs.

6.3.5 Material Use and Balance of Design

Garments shall be balanced in design so that not less than 40% of the minimum required amount of retroreflective or combined-performance and background materials specified in Table 1 is present on both the front and the back when laid flat.

Additional retroreflective or combined-performance and background materials may be incorporated into garments as determined by the user.

NOTE: Finished garments are required to incorporate the minimum total amount of visible materials in their construction. As an example, a garment that incorporates 40% of the material on the front of the garment is to have the remaining 60% of material applied to the back of the garment.

6.3.6 Shoulder Area

HVSA without retroreflective or combined-performance material that encircles the arm shall have a minimum of 150 cm² (23.3 in.²) of retroreflective material or combined-performance material in the shoulder area to provide 180° visibility of the wearer. See Figure 1.

The shoulder area is most easily identified when the HVSA is folded flat with the front of the garment fully exposed and measuring 15 cm (5.9 in.) down from the shoulder high point, front and back.

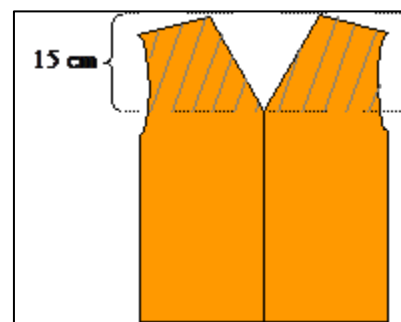


Figure 1. Shoulder area

6.3.7 Optional Accessories

Background materials and retroreflective or combined-performance materials incorporated into optional accessories shall not be less than the dimensions specified in Table 2.

Due to the optional nature of these accessories, the only design requirements are the use of compliant background materials and retroreflective or combined-performance materials, with minimum visible areas and minimum widths stated in Table 2.

7 Criteria for Optional Features and Testing

7.1 Pockets

Pockets of matching or contrasting compliant high-visibility materials shall not create gaps in retroreflective or combined-performance material of more than 50 mm (1.97 in.) horizontally.

7.2 Identification Panels, Lettering and Logos (Type R and P)

Identification panels, lettering and logos shall not create gaps in retroreflective or combined-performance material of more than 50 mm (1.97 in.) horizontally.

Identification panels, lettering and logos of contrasting non-compliant material shall not exceed a total of 465 cm² (72 in²) on the front and/or rear of the HVSA and such total amount may contribute to the minimum amount of visible background material specified in Table 1.

Identification panels, lettering and logos of contrasting non-compliant material shall cover no more than 142 cm² (22 in²) of the minimum amount of visible retroreflective or combined-performance material specified in Table 1.

7.3 Identification of Personnel (Type P)

A method of identifying the public safety entity such as an identification panel and/or trim may be incorporated into the HVSA. Public safety industries may be identified with the specific names and colors:

Red: Fire Service
Green: Emergency Medical Service (EMS)
Blue: Law Enforcement

7.4 Flame Resistance

Material for high-visibility safety apparel which is to be marked as being flame-resistant shall be tested in accordance with one of the test methods listed in Section 10.5.

8 Requirements for Background and Combined-Performance Retroreflective Materials

8.1 Color

Table 3 specifies the performance requirements for the different colors of background and combined-performance materials.

8.1.1 Background and Combined-Performance Materials Prior to Exposure Tests

For background and combined-performance material, the chromaticity shall lie within one of the areas defined in Table 3 and the total luminance factor (Y expressed as a percentage) shall be not less than the corresponding minimum in Table 3, when measured in accordance with Section 10.2.

The mean value of the total luminance factor and chromaticity coordinates of background and combined-performance material shall comply with the requirements of Table 3 when measured at each of the two rotation angles defined in Section 10.3.