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## High-Visibility Clothing Standards

### Quick Tips #153

The most recent updates made to high-visibility clothing standards by the American National Standards Institute (ANSI) and the International Safety Equipment Association (ISEA) include revisions to ANSI/ISEA 107-2004 (107-2010) and ANSI/ISEA 207-2006 (207-2011). The U.S. Federal Highway Administration (FHWA), in its 2009 Manual on Uniform Traffic Control Devices (MUTCD), and the Occupational Safety and Health Administration (OSHA) concur with the ANSI/ISEA standards concerning high-visibility clothing. The updated standards are as follows:

#### **ANSI/ISEA 107-2010: American National Standard for High Visibility Safety Apparel and Headwear**

Approved in January 2010, the revision updates the **ANSI/ISEA 107-2004** standard that specified types, classes and colors of high-visibility clothing required by workers exposed to traffic hazards, such as road construction workers, surveyors and others who work on or near roadways.

High-visibility clothing is intended to clearly distinguish the worker from the environment. The basic high-visibility garment includes three components: background material, retroreflective material (bands), and combined-performance material (a combination of retroreflective and fluorescent material that may separate the two). The color of the background material and the combined-performance material can either be fluorescent yellow-green or fluorescent orange-red. Combined performance material is considered part of the background for purposes of total area required. Retroreflective material reflects light back to the source when light shines on it.

The standard specifies three classes of high-visibility garments based on the wearer's activities. Garment classes are differentiated by the amount of background material required, the width of retroreflective material used and garment design.

Wearer/Activities	Garment Class Type
<p><b>Class 1:</b> Workers where traffic does not exceed 25 mph and there is ample separation from the traffic. These workers often include parking service attendants, warehouse workers in traffic, shopping cart retrievers and those doing sidewalk maintenance.</p>	<p><b>Class 1:</b> Garment must be relatively conspicuous, with background material equal to 217 in. in total area and retroreflective bands not less than 25mm wide.</p>
<p><b>Class 2:</b> Workers who work near roadways where traffic exceeds 25 mph and workers who need greater visibility in inclement weather. In general, railway workers, school</p>	<p><b>Class 2:</b> Greater visibility than the Class 1 garments. Background material must equal 755 in., and the minimum width of retroreflective bands is 35mm.</p>

crossing guards, parking and toll gate personnel, airport ground crews and law enforcement personnel directing traffic.

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**Class 3:** Workers with high task loads in a wide range of weather conditions where traffic exceeds 50 mph. The standard recommends these garments for all roadway construction personnel, vehicle operators, utility workers, survey crews, emergency responders, railway workers and accident site investigators.

**Class 3:** Superior visibility—the highest level of conspicuity. Background material must total 1240 in. Garment must have sleeves with retroreflective material between the shoulders and elbows. The width of retroreflective bands shall not be less than 50mm wide.

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**Class E:** When high-visibility pants are worn without other high-visibility garments, they are considered Class E. When pants are added to Class 2 or 3 garments, the ensemble is considered Class 3.

The design of the garments and location of retroreflective bands or tape is in Appendix B2 of the standard. The garments vary but can include coveralls, jackets, vests, trousers and sash belts. Section 5.2.2 of the standard has suggested design configurations. For example, 5.2.2a states that jackets, waistcoats, vests and ponchos shall be designed to permit maximum visibility of the wearer. 5.2.2b states that these garments should have one or more horizontal bands of retroreflective material around the torso and bands of retroreflective material joining the uppermost torso band from the front to the back over each shoulder.

In addition to high-visibility standards, ANSI/ISEA107-2010 adds criteria for flame resistance (section 9.5), as an optional feature of high-visibility personal protective equipment (PPE), and requires third-party testing and certification by manufacturers who claim their garments are flame resistant. The change also expands and updates testing and labeling requirements for water repellency and resistance (Appendix D1).

#### **ANSI/ISEA 207-2011: American National Standard for High Visibility Public Safety Vest**

This revision updates the **ANSI/ISEA 207-2006** standard concerning high-visibility vests for use specifically by public safety personnel. ANSI/ISEA 207-2006 established design, performance specifications and use criteria for highly visible vests worn by law enforcement, emergency responders, fire officials and DOT personnel. This standard was created in response to public safety user group demand in 2005 for a high-visibility safety vest garment that would go beyond ANSI/ISEA 107 to provide more flexibility and accommodate the need for tactical capabilities needed by law enforcement personnel, emergency responders and firefighters.

While ANSI/ISEA 207-2011 does not change the requirements for materials used to make compliant vests, it does provide direction regarding the use of logos, lettering and other identifying means to distinguish one public safety branch from another while still remaining visible to vehicle operators.

ANSI/ISEA 207-2011 sets the high-visibility clothing standard only for law enforcement, emergency responders, fire officials and DOT personnel sectors. It intends to enhance the safety of multi-agency incidents by improving visibility and identification. It seeks to reduce confusion and enhance communication between agencies. Basic vest requirements under 207-2006 include:

- Vest dimensions
- Color (red for fire officials, blue for law enforcement, green for emergency responders and orange for DOT officials)
- Material performance
- Special design features for users in fire, emergency medical, and law enforcement
- Higher-visibility (checkered color-coded reflective trim)

Some of the notable design features reflect specific needs of public safety workers, such as the need to access belt-mounted equipment (gun, radio, CPR barrier mask) and the ability for vests to tear away from the body.

The primary distinction of ANSI/ISEA 207 versus ANSI/ISEA 107 lies in the amount of fluorescent background material required. ANSI/ISEA 207 requires a minimum of 450 in<sup>2</sup>. This would fall between ANSI/ISEA 107 Class 1 (217 in<sup>2</sup>) and Class II (775 in<sup>2</sup>) garments. The difference in fluorescent material allows for design accommodation of equipment belts and for flexibility to incorporate colored panels to enhance easy, on-scene identification of wearers.

In addition, the update calls attention to the service-life guidelines for high-visibility apparel established by the Federal Highway Administration (FHWA). Environment, usage and extent of wear can affect the condition of safety apparel. Wearers are urged to become familiar with FHWA and manufacturers' guidelines to ensure that the items they are wearing continue to provide the necessary visibility and protection.

### **OSHA Issues Interpretation Letter**

On August 5th 2009, OSHA published an interpretation revising their response to use of high-visibility garments worn by construction workers in highway work zones. In this interpretation letter, OSHA is providing a more comprehensive answer to clarify and expand on OSHA's reasons for concluding that section 5(a)(1) (General Duty Clause) requires construction workers in highway/road construction work zones to be protected from road and construction traffic by wearing high-visibility garments. OSHA determined the need for high-visibility clothing based on the FHWA Worker Visibility final rule published in November of 2008.

### **Sources**

ANSI/ISEA 107-2010 American National Standard for High Visibility Safety Apparel,  
[www.ansi.org](http://www.ansi.org)

ANSI/ISEA 207-2006 American National Standard for High-Visibility Safety Vests,  
[www.ansi.org](http://www.ansi.org)

2009 Manual on Uniform Traffic Control Devices (MUTCD), <http://MUTCD.FHWA.dot.gov>

Occupational Safety and Health Administration (OSHA), [www.OSHA.gov](http://www.OSHA.gov)

(Rev. 7/2012)

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