

# WRA Testing and Certification

## High Visibility Clothing

In recent years, the rapid development of traffic industry leads to high increase of road construction, reconstruction and private car ownership, bringing convenience to our daily lives, and also high-frequency traffic accidents. To strengthen the personal safety protection, the market demand for high-visibility clothing is expanding. The application covers such departments and industries as police, first aid, postal express, sanitation, airport and construction..., even campus and people's daily lives. High-visibility clothing has gradually become an integral part of our lives and even the necessary personal protective equipment.



## What is High-Visibility Safety Apparel?

The purpose of high-visibility safety apparel is to make workers stand out from their background, to differentiate the wearer as a person, and to provide greater visibility during night time work. The workers should be visible when they are standing, walking, bending, squatting, and turning sideways. The worker should be identifiable as a person by a motorist approaching from the front, back or side. The worker should be visible during day and night work. You can choose various colors and classes of garments depending on the work being done and time of day.

High-visibility apparel consists of a fluorescent-colored base as background material that is intended to be highly visible. The color of the background material can either be fluorescent yellow-green or fluorescent orange-red. The retroreflective material is the band of material placed over the background, intended to reflect light back to the source when light shines on the apparel.

## In choosing clothing colors keep in mind:

- Workers should not be the same color as traffic barrels and traffic cones.
- Workers should not be the same color as construction vehicles.
- Workers should not be the same color as emergency vehicles.
- Workers should be identifiable to both motorists and construction vehicle operators.
- Motorists should be able to identify a worker before they get within 1,000 feet of the worker.
- Contrast against background is important. For example, orange vests may be best against wooded, green backgrounds while green vests may be best to contrast with orange barrels and cones.

- For night work, these garments must also be retroreflective. The retroreflective material shall be orange, yellow, white, silver, strong yellow-green, or a fluorescent version of one of these colors and shall be visible at a minimum distance of 1,000 feet.

### Classes of Apparel:

There are three classes of garments based on the wearer's activities. The classes are differentiated by the amounts of Fluorescent and retroreflective material, the placement of the material, and the design and color of the vest used.

**ANSI Type O, Class 1 Performance:** Class 1 offers the minimum amount of high visibility materials to differentiate the wearer from non-complex work environments and is only appropriate for off-road environments.

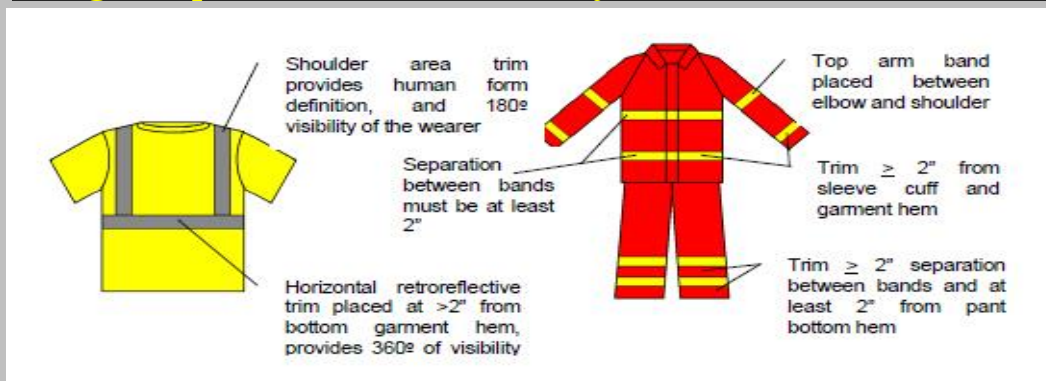
**ANSI Type R or P, Class 2 Performance:** Class 2 is considered the minimum level of protection for workers exposed to roadway rights-of-way and temporary traffic control (TTC) zones. Garments will have additional amounts of high-visibility materials that allow for better definition of the human form.

**ANSI Type R or P, Class 3 Performance:** Class 3 provides more visibility to the wearer in both complex backgrounds and through a full range of movement by the required placement of background, retroreflective, and combined performance materials on the sleeves and pant legs (if present). Garments have an even a greater minimum level of high visibility material the apparel must contain. A garment or vest without sleeves worn alone is NOT considered Class 3 protection.

**ANSI Class E:** High visibility garments that do not qualify as meeting the requirements of the standard when worn alone, but when a Class E item is worn with a Class 2 or Class 3 garment, the overall classification of the ensemble is Class 3.

If the garment is intended to provide protection during rainfall, background materials also need to be tested as water repellent, water resistant, and /or water proof.

### Design Requirement for Hi-Visibility Garments:



## **High-visibility standards used around the world:**

### **International:**

EN ISO 20471:2013 – ‘High-visibility clothing – Test methods and requirements’

### **Europe:**

EN471:2003+A1:2007 – ‘High-visibility warning clothing for professional use – Test methods and requirements’

EN ISO 20471:2013 – ‘High-visibility clothing – Test methods and requirements’

EN 1150 which governs non-professional work wear where good visibility is required, e.g. horse riding bibs and cyclists garments.

GO/RT3279 (Rail Track), where working next to railway lines. On the UK railway network, the wearing of high visibility clothing has become a mandatory requirement for all persons associated with track or lineside working

### **Australia/New Zealand:**

AS/NZS 1906.4:2010 – ‘Retro-reflective materials and devices for road traffic control purposes – High-visibility materials for safety garments’

AS/NZS 4602:1999 – ‘High-visibility safety garments’

### **Brazil:**

ABNT NBR 15292:2005 – ‘High-visibility warning clothing for professional use’

### **China:**

GB20653:2006 – ‘High-visibility warning clothing for professional use’

### **Canada:**

CAN/CSA Z96.1-08 – ‘Guideline on selection, use, and care of high-visibility safety apparel’

CSA Z96-09 – ‘High-visibility safety apparel’

### **Malaysia:**

AMS1731:2004 – ‘High-visibility warning clothing for professional use’

### **USA:**

ANSI/ISEA 207-2006 – ‘US national standard for high-visibility public safety vests’

ANSI/ISEA 107-2010 – ‘High-visibility safety apparel’

### **India:**

IS 15809:2017: ‘High Visibility Warning Cloths’

**WRA (Wool Research Association) evaluate the design of an item of clothing in terms of how much surface area constitutes background material, retroreflective material and combined performance material.**

**We also assess against the minimum width requirements for retroreflective materials and the number and design of bands, if appropriate.**

**In addition, for background (fluorescent) material, we test for chromaticity – the quality of colour, independent of brightness – and luminance – the intensity of light emitted, in a given direction, from a surface per unit area.**

**We also evaluate Retroreflection refers to light rays being returned in the direction from which they came, and this can be achieved by introducing specially-shaped optical units to the material(s) concerned. These retroreflective elements can be incorporated on safety vests, jackets and other clothing. The performance of retroreflective materials is determined by measuring the coefficient of retroreflection in specified entrance and observation angles.**

**WRA can advise on the types of testing required for any particular PPE standard, which may also depend on the materials used in, and the construction of, different garments.**

**Contact WRA now to find out whether your Hi-Vis garment comply with relevant standards, safeguard employees and the public, and reduce business risk.**

**WRA contact details are as follows:**

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