High-Visibility Safety Apparel – Fact Sheets



WHAT IS HIGH-VISIBILITY SAFETY APPAREL (HVSA)?

How is anthrax contracted?

High-visibility safety apparel (HVSA) is clothing (e.g., vests, bibs, or coveralls) that workers can wear to improve how well other people "see" them (their visibility). Most often, high-visibility clothing is worn to alert drivers and other vehicle operators of a worker's presence, especially in low light and dark conditions. High-visibility headwear can also be worn to increase the visibility of the wearer in situations where part or all of the wearer's body could be obscured (e.g., leaves/trees, traffic barriers, construction materials, etc.).

Requirements for high-visibility safety clothing for Canadian workers are found in the CSA Standard Z96-15 High-Visibility Safety Apparel. In the United States, see the ANSI/ISEA 107-2015 American National Standard for High-visibility Safety Apparel and Accessories.

Why do I need High-Visibility Safety Apparel?

High-visibility safety apparel (HVSA) is needed if you work when there is low light and poor visibility, especially if you are working around moving vehicles (cars, trucks or other machinery traveling under their own power – e.g., forklifts, backhoes, etc). High-visibility items allow you to be seen by the drivers of those vehicles sooner and more readily. This fact increases your safety at work. The human eye responds best to large, contrasting, bright or moving objects. Worker visibility is enhanced by high colour contrast between clothing and the work environment against which it is seen.

When do I need High-Visibility Safety Apparel?

The CSA Standard recommends that a hazard assessment be carried out on each job site to evaluate the workplace or work site for known or potential hazards a worker can encounter while performing a job or task. This assessment helps determine the risk to workers of being hit by moving vehicles and the environmental conditions under which work is performed.

When doing a hazard assessment where HVSA might be required, be sure to consider:

- The type and nature of the work being carried out – including the tasks of both the HVSA wearer and any drivers.
- Whether workers will be exposed to heat and/or flames (if so, flame-resistant HVSA would be required).
- Work conditions, such as indoor or outdoor work, temperature, work rates, traffic flow, traffic volume, visibility, etc.
- The workplace environment and the background workers must be seen in (e.g., is the visual area behind the workers simple, complex, urban, rural, highway, filled with equipment, cluttered).
- How long the worker is exposed to various traffic hazards, including traffic speeds.
- Lighting conditions and how the natural light might be affected by changing weather (sunlight, overcast sky, fog, rain, or snow).
- Factors that affect warning distances and times, such as the volume of traffic, the size of vehicles, their potential speeds, the ability to stop quickly, and surface conditions.
- If there are any engineering and administrative hazard controls already in place (e.g., barriers that separate the workers from traffic).
- Any distractions that could draw workers attention away from hazards.
- The sightlines of vehicle operators, especially when vehicles are operated in reverse.
- If certain jobs, or the function being done, need to be “visually” identifiable from other workers in the area.

Once a hazard assessment is complete, the employer can select appropriate controls. The first line of defence for workers’ safety would be to control the design of the workplace and reduce the exposure of workers to moving vehicles (e.g., through the use of physical barriers and other engineering and administrative controls). Using high-visibility apparel would be the last line of defence against accidents by providing more warning to vehicle operators that workers are on foot in the area.

What is the difference between fluorescent and retroreflective materials?

Fluorescent material takes a portion of invisible ultraviolet light from sunlight, and through special pigments, sends it back to the viewer as more visible light. This material only functions where there is a source of natural sunlight. Fluorescent material will appear brighter than the same coloured non-fluorescent material, especially under low natural light (e.g., cloud cover, fog, dusk, dawn, etc.). This property offers daytime visibility enhancement not present with other colours. These materials enhance daytime visibility, especially at dawn and dusk. Fluorescent colours provide the greatest contrast against most backgrounds.

Retroreflective material is created to return light in the direction of the light’s source. This property will let a driver to see the light being reflected from the retroreflective material on a person’s garment (as long as the person is standing in the light’s beam). Retroreflective materials are most effective under low-light level conditions. While retroreflective materials can still reflect in the daylight, there is little difference between the light reflected from the garment’s material and the surrounding environment. This lack of

contrast makes retroreflective materials ineffective for enhanced visibility during (sunny) daytime conditions.

In contrast, **reflective materials** bounce light off of its surface so that it can be seen. While the term “reflective” is not used in the CSA standard, it is typically defined as a material or object that has the ability to “throw back” light (or sound). Most surfaces are already light reflective.

Combined-performance retroreflective material is a retroreflective material that is also a fluorescent material. Not all retroreflective materials are fluorescent, however, and not all fluorescent materials are retroreflective.

WHAT SHOULD I LOOK FOR IN HIGH-VISIBILITY SAFETY APPAREL?

Size/Coverage:

- Large, bright garments are more visible than small ones. Coverage all around the body (360° full body coverage) provides better visibility in all viewing directions.
- Stripes of colours that contrast (have a distinct colour difference) with the background material to provide good visibility. Stripes on the arms and legs can provide visual clues about the motion of the person wearing the garment.
- When background material is bright-coloured or fluorescent material, it is intended to be highly visible, but is not intended to provide retroreflective performance.
- Other requirements such as flame resistance, thermal performance, water resistance, durability, comfort, tear-away features, material breathability and flexibility that are applicable to the job.

Employers should select the colour and stripe combination that provides the preferred contrast and visual indication of movement.

Fit:

- For safety and best performance, garments should be fitted to the person. Don’t forget to consider the bulk of clothing that might be worn underneath the garments, and how the garment should be worn (i.e., done up properly around the body with no loose or dangling components). The garments should sit correctly on your body and stay in place during your work.
- The apparel should be comfortable to wear – the parts of the apparel that come into direct contact with the worker should not be rough, have sharp edges, or projections that could cause excessive irritation or injuries. The apparel should also be lightweight.
- Garments should be selected and worn so that no other clothing or equipment covers the high-visibility materials (e.g., glove gauntlets, equipment belts, and high-cut boots).

Brightness:

- Daylight – Bright colours are more visible than dull colours under daylight conditions (e.g. fluorescent materials are suitable for daylight).
- Low light conditions – Fluorescent colours are more effective than bright colours under low light (e.g. dawn and dusk). Under these conditions, reflective materials are also suggested.

- Dark conditions/worksites – Greater retroreflectivity provides greater visibility under low light conditions. Retroreflective materials provide high-visibility conditions and are preferred over bright colours. Fluorescent materials are ineffective at night and less visible than white fabrics.

Design:

To comply with the CSA Standard, the HVSA should meet the following criteria for the stripes/bands:

1. A waist-level horizontal stripe/band that goes completely around the HVSA.
2. Two vertical stripes on the front passing over the shoulders and down to the waist.
3. A symmetric “X” on the back extending from the shoulders to the waist.
4. For Class 3 apparel, stripes/bands encircling both arms and both legs are added.

Colour:

For all classes, the CSA Z96-15 High-Visibility Safety Apparel Standard specifies both the colour of the background and the stripes/bands. Class 1 (e.g., harness style) must have a minimum of 0.14 metres squared of background material. Background material should be one of fluorescent yellow-green, fluorescent orange-red or fluorescent red; or one of bright yellow-green, or bright orange-red.

Care/Maintenance:

- Keep your high-visibility apparel clean and well-maintained. Contaminated or dirty retroreflective materials provide lower visibility.
- Replace garments that show signs of wear and tear, soiling, or contamination as it will no longer be able to provide acceptable levels of visibility.

Purchasers of HVSA should get proof that the materials used and the design of the garment meet the requirements.

WHAT ARE THE DIFFERENT CLASSES OF SAFETY APPAREL?

The CSA Standard Z96-15 High-Visibility Safety Apparel sets out levels of retroreflective performance (i.e., the effectiveness of material in returning light to its source), the colours and luminosity of background materials, and how much of the body that should be covered by the high-visibility components. There are also special requirements for garments that to provide electrical flash and flame protection. Note that although specifications for apparel Classes are similar to those in ANSI/ISEA 107, these CSA Classes differ in that they specify body coverage rather than minimum areas.

CSA lists three classes of garments based on body coverage provided. Each class covers the torso (waist to neck) and/or limbs according to the minimum body coverage areas specified for each class.

- Class 1 provides the lowest recognized coverage and good visibility.
- Class 2 provides moderate body coverage and superior visibility.

- Class 3 provides the greatest body coverage and visibility under poor light conditions and at great distance.

Details for each of the classes are listed below. For more details on the exact specifications, please refer to the Standard. (Note: While the Standard does not provide specifications for the application of high-visibility apparel to specific job types, the Guide does provide some examples of jobs where the different classes may be appropriate.)

When would I wear the different classes of High-Visibility Safety Apparel?

Low Risk: Class 2, Class 1 under certain conditions

Examples of situations that could be considered lower risk:

- Workers in activities that permit full and undivided attention to approaching traffic.
- When there is ample separation between the worker on foot and the traffic.
- When work backgrounds are not complex, allowing for optimal visibility.
- When vehicles are moving slowly (e.g., less than 40 km/h (25 mph).
- When workers are doing tasks that divert attention from approaching traffic.

Examples of jobs include:

- Workers directing vehicle operators to parking or service locations.
- Workers retrieving shopping carts in parking areas.
- Workers in warehouse operations.
- “Right-of-Way” or sidewalk maintenance workers.
- Workers in shipping or receiving operations.

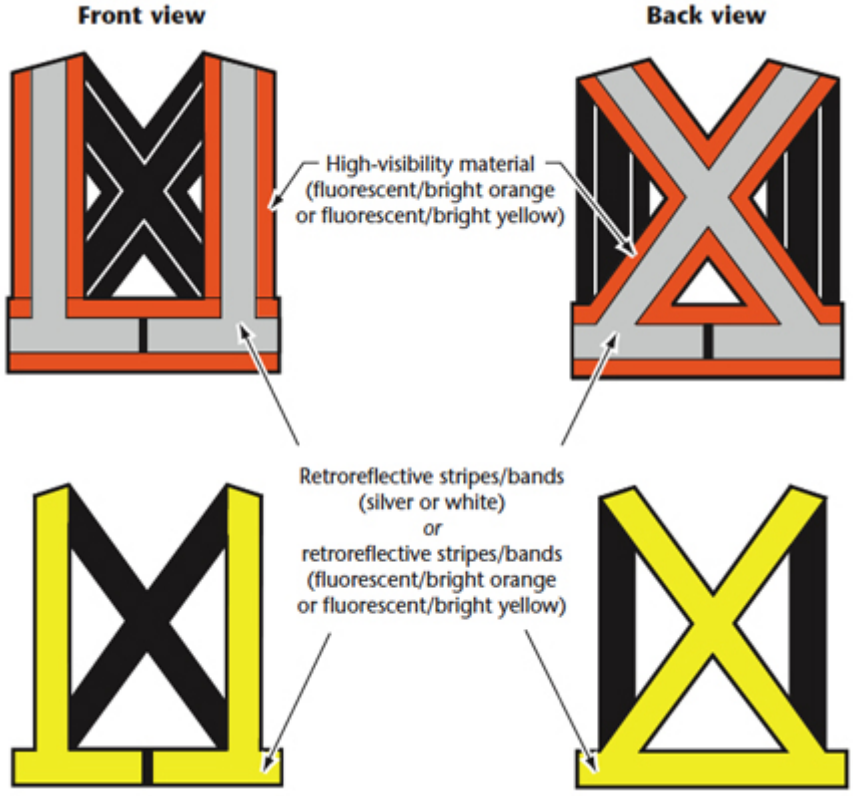


Figure 1

Example of Class 1 Apparel

Harness or Colour/Retroreflective Stripes on Other Clothing

NOTE: Other options are possible, including a shirt made of non-high-visibility material, but with high-visibility or retroreflective stripes/bands.

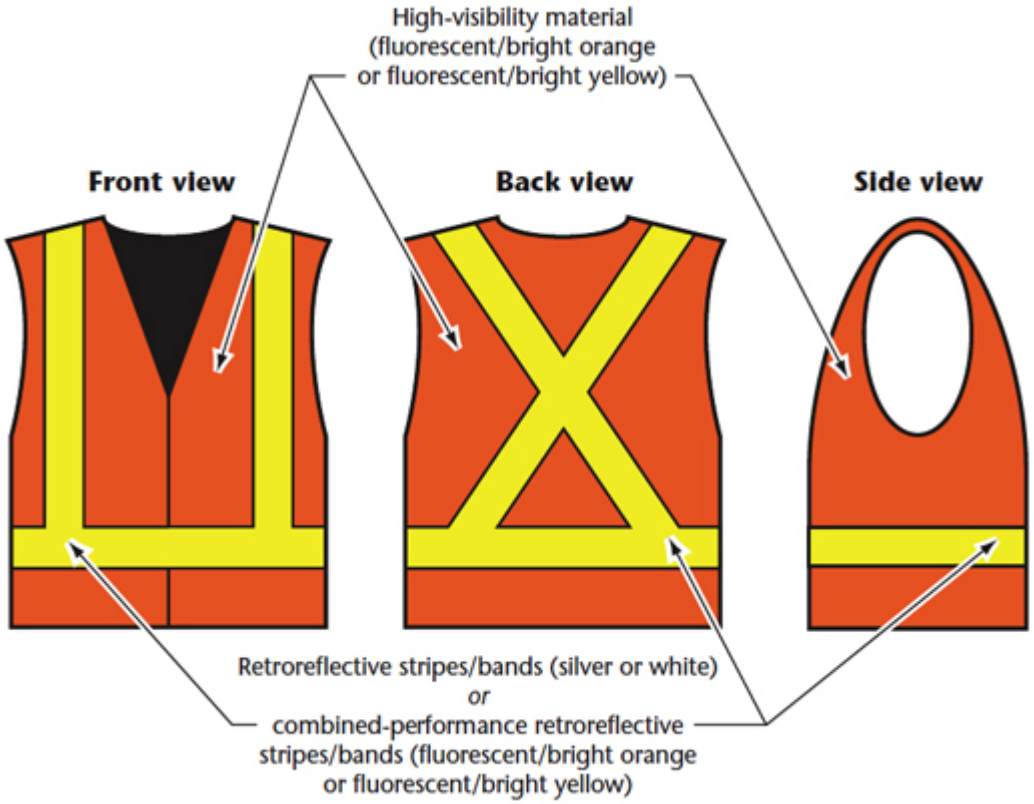
Medium Risk: Class 2 or 3 based on certain conditions

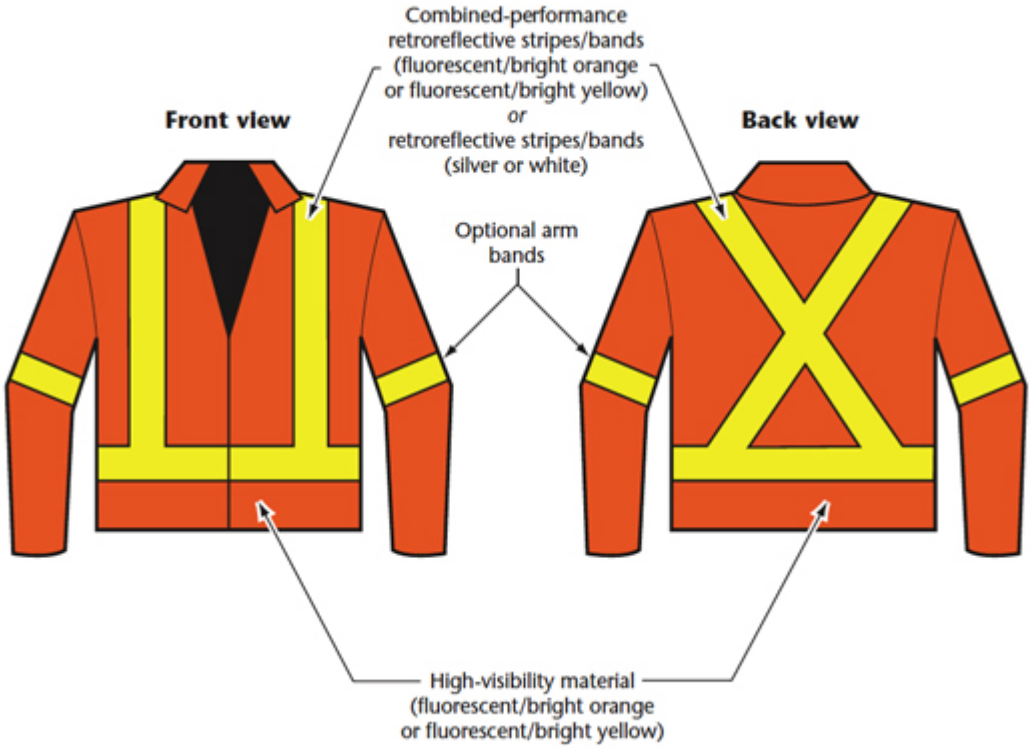
Examples of situations that may be of medium risk:

- When vehicles or equipment are moving between 40-80 km/h (25-50 mph).
- Workers who require greater visibility under inclement weather conditions or low light.
- When work backgrounds are complex.
- When workers are performing tasks that divert attention from approaching vehicle traffic.
- When work activities are in closer proximity to vehicles (in or near flowing vehicle traffic).

Examples of jobs include:

- Roadway construction, utility, forestry or railway workers.
- Utility workers.
- Survey crews.
- Forestry workers.
- School crossing guards.
- Parking and/or toll gate workers.
- Airport baggage handlers and ground crews.
- Emergency response personnel.
- Members of law enforcement.
- Accident site investigators.
- Railway workers.





Bib overalls



Figure 2

Examples of Class 2 Apparel

Vests, Jackets and Bib overalls

NOTE: These examples are not the only options available and are shown for example purposes.

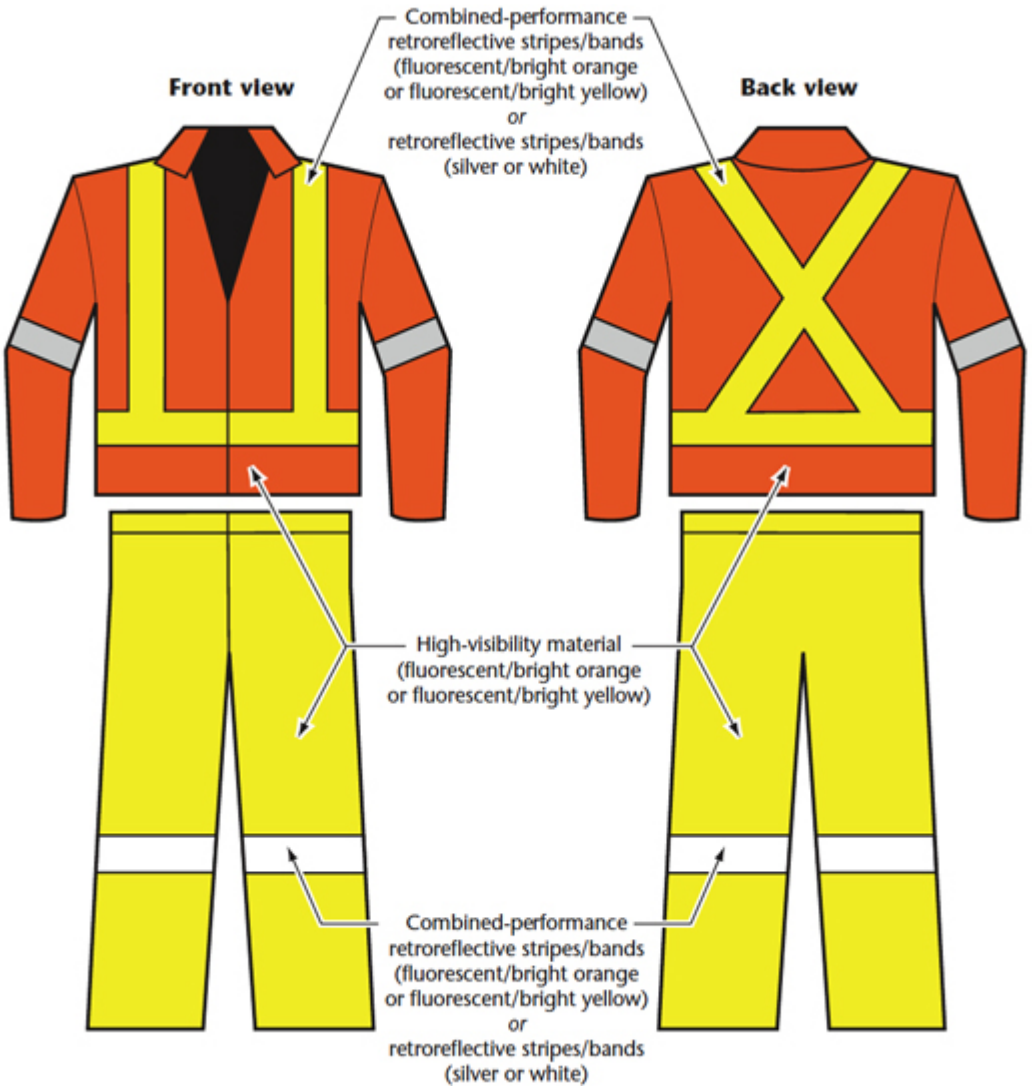
High Risk: Class 2 for daytime, Class 3 for low-light conditions

Examples of situations that may be high risk:

- Vehicle speeds exceeding 80 km/h (50 mph).
- Workers on foot and vehicle operators with high task loads that clearly place the worker in danger.
- When the wearer must be conspicuous through the full range of body motions at a minimum of 390 m (1,280 ft).
- Work activities taking place in low light or at nighttime.

Examples of jobs include:

- Roadway construction workers.
- Utility workers.
- Survey crews.
- Emergency responders.
- Road assistance/courtesy patrols.
- Flagging crews.
- Towing operators.


Front view
Back view
Combined-performance retroreflective stripes/bands (fluorescent/bright orange or fluorescent/bright yellow) or retroreflective stripes/bands (silver or white)
High-visibility material (fluorescent/bright orange or fluorescent/bright yellow)
Combined-performance retroreflective stripes/bands (fluorescent/bright orange or fluorescent/bright yellow) or retroreflective stripes/bands (silver or white)

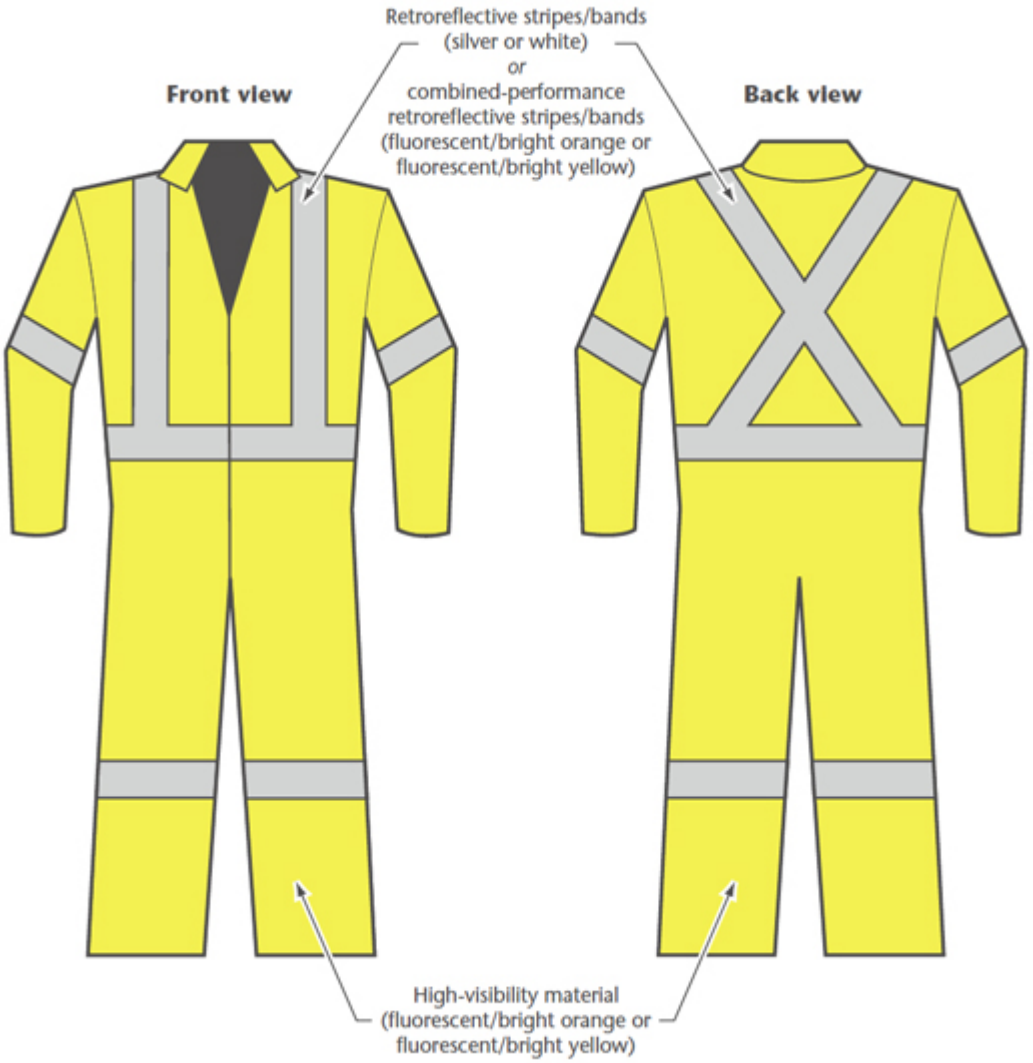


Figure 3

Examples of Class 3 Apparel

Jackets and Overalls

WHAT SHOULD WORKER TRAINING INCLUDE?

As with any personal protective equipment, workers should be given appropriate training in the use and care of the equipment. The following minimum information should be provided to workers wearing high-visibility apparel:

1. When to use the high-visibility apparel.
2. Fitting instructions, including how to put on and take off the apparel, if relevant.
3. The importance of using the apparel only in the specified way.
4. Limitations of use.
5. How to store and maintain the apparel correctly.
6. How to check for wear and tear.
7. How to clean or decontaminate the apparel correctly, with complete washing and/or dry cleaning instructions.

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