

CSA Standard Z96-02 High-Visibility Safety Apparel

Scope and Application:

This standard specifies requirements for occupational apparel that is capable of signalling the user's presence visually; and intended to provide the user with conspicuity in hazardous situations under any light conditions and under illumination by vehicle headlights. Performance requirements are included for colour, retro-reflection, and minimum areas, as well as for the configuration of the materials.

Conspicuity is enhanced by high contrast between clothing and the work environment against which it is seen. This standard provides performance requirements for conspicuous materials to be used in high-visibility apparel and specifies Classes of garments, minimum areas, and placement of these materials.

Definitions:

- **Conspicuity** - characteristics of an object that determine the likelihood that it will come to the attention of an observer, especially in a complex environment that has competing objects.
- **Retro-reflective Material** - Material that reflects light directly back to its origin.
- **Combined- Performance Retro-Reflective Material** - Retro-reflective material that is also a fluorescent material.
- **Photometric Performance Level** - The effectiveness of retro-reflective material in returning light to its source, measured in terms of the coefficient of retro-reflection.

This standard specifies minimum amounts of retro-reflective materials, together with colour requirements for placement of materials, for apparel used to enhance the visibility and safety of workers. Categories of high-visibility garments are identified and appropriate markings for apparel are recommended. Performance requirements are also provided for the physical properties of background materials used in the construction of high-visibility safety apparel. 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.

The standard specifies three colours for background materials and contrasting stripes. This should provide options that are intended to create conspicuity against most work environments. Users should consider the work environment in which protection is required and select the colour and stripe combination that provides the preferred contrast and visual indication of movement.

Fluorescent Background Material

Fluorescent Yellow – Green
Fluorescent Orange – Red
Fluorescent Red

Bright Background Material

Bright Yellow - Green
Bright Orange - Red
Bright Red

Three high-visibility apparel classes are specified in terms of the body coverage provided. Each high-visibility apparel class shall cover the torso and / or limbs in accordance with the minimum areas for each class described. High-visibility safety apparel shall be designed and manufactured to meet the requirements in the standard. The materials and components of high-visibility safety apparel should not be known to adversely affect the wearer. The safety apparel should offer the wearer the best possible degree of comfort while still providing adequate protection. Any part of the safety apparel that comes into direct contact with the end user should be free of roughness, sharp edges, and projections that could cause excessive irritation or injuries.

Class 1 – apparel consists of a basic harness or stripes / bands over the shoulder(s) and encircling the waist. The center portion of the front torso band between the two vertical bands is optional.

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Class 2 – apparel has full coverage of the upper torso (front, back, sides and over the shoulders). Stripes/bands shall be composed of retro-reflective or combined performance materials.

Class 3 – apparel that meets the same requirements as Class 2 with the addition of bands encircling both arms and both legs. These bands shall be composed of combined performance stripes/bands or a combination of retro-reflective and background material.

Each piece of high-visibility apparel shall be marked as specified below:

- 1) **Marked on the product itself or label, permanently affixed and durable**
- 2) **Large enough to convey immediate understanding**
- 3) **Have name, trademark or other means of ID of the manufacturer**
- 4) **Have designation of the product type, commercial name, or code**
- 5) **Shall have size designation**
- 6) **Shall have the CSA Z96 designation**
- 7) **Apparel Class & level of performance for the retro-reflective material**
- 8) **An indication of background material as fluorescent or bright-coloured**
- 9) **An indication of FR performance, if applicable.**

Written instructions for use shall be supplied to each purchaser of high-visibility apparel. The following minimum information shall be provided:

- a) Fitting instructions, including how to put on and take off the apparel,
- b) Necessary warnings of misuse;
- c) Limitations of use.
- d) Storage: how to store and maintain correctly
- e) Maintenance and cleaning / decontamination etc.

In order to select the appropriate garment, the user shall consider the following basic principles in the selection of high-visibility apparel:

- A risk assessment of the job site should be conducted before selecting the appropriate apparel.
- Engineering and administrative controls of traffic and hazards around the workplace should be employed first to reduce risk to pedestrians. High – visibility apparel is considered to be a second line of defense against accidents.
- Worksite background significantly affects the conspicuity of garments.
- Environmental conditions significantly affect the garment's conspicuity
- Bright colours are more conspicuous than dull colours in daylight conditions
- Bright colours are less effective than fluorescent colours in low light.
- Full body coverage, 360 degrees around body, provides better conspicuity
- Garments that are no longer able to provide minimum acceptable levels of conspicuity, due to wear and tear, soiling, contamination, or age, present a false sense of safety and should be replaced.
- Other factors such as flame resistance, thermal performance, durability, launderability, comfort, flexibility and sizing should be considered when selecting a garment for the job.

This bulletin contains a summary of excerpts taken from the Standard, for general information purposes only. This bulletin is not reflective of the complete requirements that the Standard prescribes.

Note: *Manitoba Regulation M.R. 217/2006 Section 1.4 inconsistency:*

If there is an inconsistency between this regulation and a requirement contained in a publication, code or standard referenced in this regulation, the provisions in this regulation prevail.