



**RADIANS®**

**HI-VIZ  
PROTECTION  
FAST  
FACTS**



w w w . r a d i a n s . c o m

The **need** to be seen is a critical issue for worker safety, especially for workers who perform tasks on or near moving vehicles or equipment.

Wearing high visibility garments draws attention to workers & helps prevent injuries and fatalities from struck by hazards.



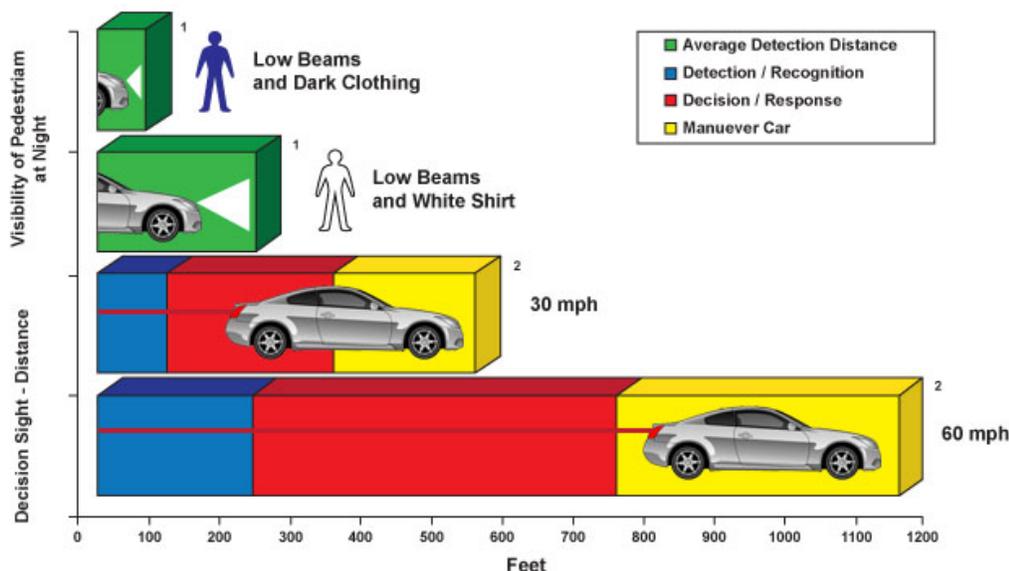
RADICALLY VISIBLE™



2004 – 15% of 2,460 fatalities from transportation related accidents were from worker being struck by moving vehicle.

2007 - 305 of 639 fatalities that occurred at road construction sites were from “struck by vehicle” accidents.

IMPORTANCE OF HIGH VISIBILITY & REACTION TIME



1 R.D. Blomberg, A. Hale, and D.F. Preusser, "Experimental Evaluation of Alternative Conspicuity-Enhancement Techniques for Pedestrians and Bicyclists," Journal of Safety Research, Volume 17, pp. 1-12, 1986.



ANSI 107-2020

The American National Standard for High-Visibility Safety Apparel and Headwear (ANSI/ISEA 107-2020) is a standard established by American National Standards Institute, Inc. (ANSI) and the International Safety Equipment Association (ISEA).

Construction, utility, police, emergency medical services, fire fighters, road workers, flaggers and airport ramp workers are routinely exposed to the hazards of low visibility while on the job. This standard provides guidelines for the selection and use of high-visibility safety vests to improve worker visibility during the day, in low-light conditions, and at night.

ANSI / ISEA 107-2020 guidelines are divided into Multiple Types (O, R, P, and Supplemental) as well as 4 Classes (1, 2, 3 and E ) according to the level of risk present depending on working environment.

## PERFORMANCE CLASS - Garment Type

- Type O - Class 1 - Off-road
- Type R - Class 2 & Class 3 - Roadway and Temporary Traffic Control
- Type P - Class 2 & Class 3 - Public Safety
- Supplemental Items - Class E - Pants, Overalls, Shorts, Rain Pants, and Gaiters

## ENSEMBLE

- Class 2 + Class E = Class 3



## ANSI 107 VISIBILITY REQUIREMENTS

### Type O: Class 1

Class 1 provides the minimum amount of high-visibility materials required to differentiate the wearer visually from non-complex work environments where struck-by hazards will not be approaching at roadway speeds.

#### APPLICATIONS:

Warehouse Workers  
Mining  
PetroChem

#### TYPE O: CLASS 1 Minimum Requirements

Background Fabric	217 Square Inches
Reflective Material	155 Square Inches
Minimum Reflective Width	1 Inch

### TYPE R: Class 2 & 3

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. 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.

#### CLASS 2 APPLICATIONS:

Roadway Construction Worker  
Municipalities  
Airline Ramp Personnel

#### CLASS 3 APPLICATIONS:

Flaggers  
Dept of Transportation  
Nighttime Work  
Municipalities  
State of VA

Background Fabric	775 Square Inches
Reflective Material	201 Square Inches
Minimum Reflective Width	1.375 Inch

Background Fabric	1240 Square Inches
Reflective Material	310 Square Inches
Minimum Reflective Width	2 Inches

### TYPE P: Class 2 & 3

Type P provides 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 right-of-ways, 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.

#### CLASS 2 & 3 APPLICATIONS:

Police  
Fire  
EMS  
Sheriff

#### TYPE P: CLASS 2 Minimum Requirements

Background Fabric	450 Square Inches
Reflective Material	201 Square Inches
Minimum Reflective Width	2 Inches

#### TYPE P: CLASS 3 Minimum Requirements

Background Fabric	775 Square Inches
Reflective Material	310 Square Inches
Minimum Reflective Width	2 Inches

GARMENT DESIGN REQUIREMENTS

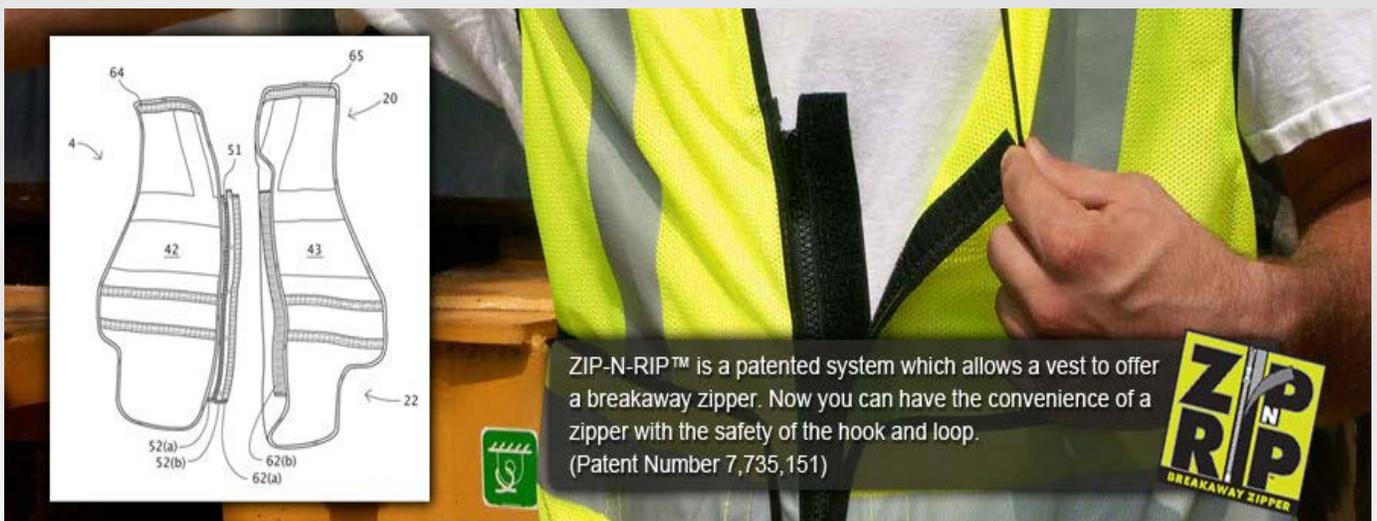


PRIMARY COMPONENTS OF ANSI 107



CLASS 2 VEST

ZIP-N-RIP™ BREAKAWAY ZIPPER



## BACKGROUND MATERIAL DAYTIME VISIBILITY

### ANSI APPROVED COLORS

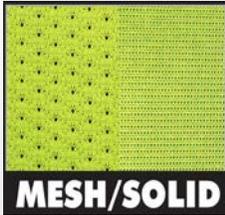
- Fluorescent Orange
- Yellow-Green
- Red



**COLORS**

### MATERIAL DENSITY

- Minimum hole size of mesh



**MESH/SOLID**

## ENVIRONMENT RISK ASSESSMENT BACKGROUND COLOR



## BASE FABRICS - VESTS

Solid Knit



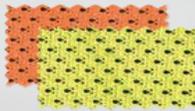
Solid Weave



Mesh Fabric

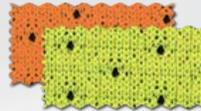


Micro Mesh



## BASE FABRICS - T-SHIRTS

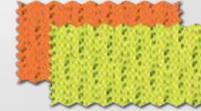
Breezelite™



Ultra Breezelite™



Birdseye Mesh



Jersey Knit



## REFLECTIVE MATERIALS

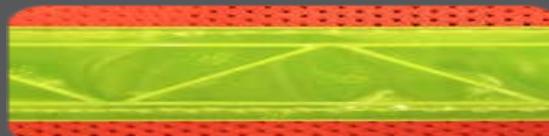
Silver Tape or Glass Bead



Gloss or Prismatic Tape



Combined Performance



Contrasting Trim



Segmented Tape



# FLAME RESISTANT GARMENTS

There are multiple types of FR High Visibility garments on the market. **NOT ALL ARE CREATED EQUAL.**

Under the new ANSI 107:2015 standard, all vests must be labeled either FR or NOT FR.

**To be labeled FR, the vest materials must:**

1. Be certified to one of six specified standards
2. Be made from an inherently flame resistant fiber such as a Modacrylic.
3. Must be difficult to ignite.
4. Must not melt or drip.

**A garment is not truly FR if:**

1. It contains polyester - even if treated.
2. It melts or drips when ignited.
3. It has only been tested to NFPA 107 or ANSI D6413
4. It does not have an Arc rating on the tag
5. The manufacturer cannot provide a 3rd party certification of materials.

**Why is this so important?**

1. Some treated polyester vests and rainwear could have been marked as FR prior to the ANSI 107:2010 standard and are still on the market as FR which causes confusion.
2. Use of a treated polyester vest where a flash fire or arc flash hazard can lead to significant injury.



JUST BECAUSE IT SAYS  
**DOESN'T MEAN IT IS**

**FR**



COMPETITOR MARKINGS FOR TREATED



COMPETITOR MARKINGS FOR TREATED

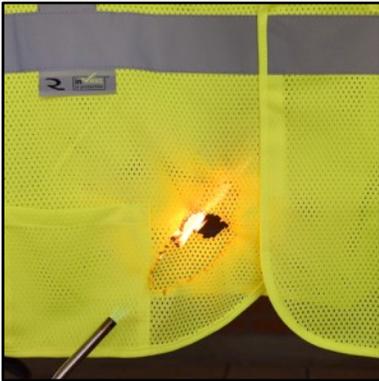
**To avoid confusion and potential misuse, Radians uses the term "Self Extinguishing" (SE) for treated polyester vests and rainwear.**

**SE VESTS:**

- Made from treated polyester
- Material tested to ASTM D6413
- Labeled as NOT FR per ANSI/ISEA 107
- Will not continue to burn when flame is removed.
- Not for use where arc flash or flash fire hazard exists.

**FLAME RESISTANT COMPARISON**

**REGULAR POLYESTER VEST**



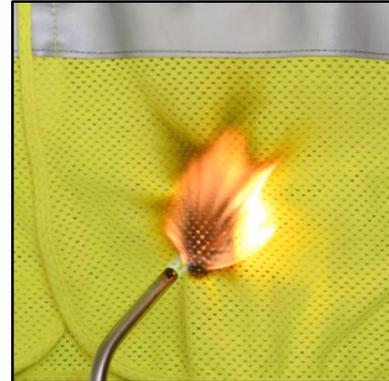
**Quick Flame Ignition  
Continuous Burning  
Melting & Dripping**

**SE TREATED POLYESTER VEST**



**Quick Flame Ignition  
Flame Extinguishes Quickly  
Minor Melting & Dripping**

**FR MODACRYLIC VEST**



**NO Flame Ignition  
Chars But Does Not Burn  
NO Melting & Dripping**

**NOTES:**

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**RADIANS**

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