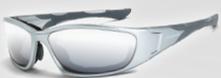




RADIANS®

**VISION
PROTECTION
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The U.S. Personal Protective Equipment (PPE) market generated revenues of approximately

\$1.8 Billion in 2016.

The market for Vision Protection in the U.S. accounted for

24.6 percent (\$400 million)

of the overall personal protection equipment market, making this segment the second largest.



The total eyewear market is mainly driven by one segment, the non-prescription safety glasses market, which has a dominating share of the market in terms of both revenues and unit shipment

Safety Eyewear Segments

<p>Non-Prescription (Plano) safety spectacles 71%</p>	<p>Prescription (Rx) safety spectacle frames 18%</p>	<p>Safety Goggles 11%</p>
		

Safety Eyewear Compliance

Eyeglasses are not safety glasses unless both the lenses and the frame are in compliance with the specifications for safety eyewear described in the ANSI Z87.1 standard.

WHAT'S THE DIFFERENCE BETWEEN OSHA, ANSI and ISEA?

- ISEA is Responsible for Creating the Standards
- ANSI Publishes the Safety Standards
- OSHA Adopts the ANSI Standards and Enforces the Compliance of Safety Standards



MINOR CHANGES FROM ANSI Z87.1-2010 STANDARDS TO THE NEW 2015 STANDARDS.

- Clarifications to Markings on lens and frame.
- High Velocity Impact harmonized with international standards.
- Clarification of Impact Pass/Fail criteria.
- Change in Fine Particle Dust Test.
- Clarification to resolving power test procedure.
- Special purpose lenses are not restricted by light transmission

Safety Eyewear Standards

ANSI Z87.1-2015

The ANSI Z87.1 standard defines the specifications for acceptable safety glasses.

The various branches of the U.S. military have recognized for many years that eye injuries are an inevitable by-product of their many activities.

VO Military Ballistic Performance (Mil-PRF-32432)

STANDARD	IMPACT	CALIBER	PROJECTILE
ANSI Z87 + High Velocity	150 feet / second	0.25 inch diameter steel ball (25 caliber)	
	45 meters / second		
Mil-PRF-32432 VO Ballistic	640 - 660 feet / second	0.15 inch diameter steel projectile (15 caliber)	
	195 meters / second		
High Mass Impact	17.6 oz / 50 in height	17.6 oz / 500 g projectile dropped	
	500 g / 127cm height		



International Safety Eyewear Standards

Many standards exist for assessing the performance of protective eye and face products, including requirements for impact resistance. While the test procedures may differ from region to region, the intent is to measure impact strength of the entire protector, and to set criteria for minimum levels of performance.

Canada – CSA Z94.3

In Canada, the pertinent standard is Z94.3 developed by the Canadian Standards Association (CSA).

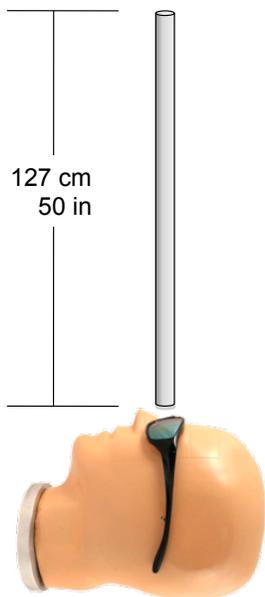
Europe – EN 166

In Europe, performance and testing of protective eyewear is governed by a suite of standards. The fundamental performance requirements are detailed in EN 166.

Australia – AS/NZS 1337

The Australian standard specifies several elevated impact resistance levels.

ANSI Z87.1-2015 - Testing
 Requirements for Impact Rated (+) spectacles



HIGH MASS IMPACT



- High impact spectacles shall be capable of resisting an impact from a projectile weighing 500 grams (17.6 oz) dropped from a height of 127 cm (50 inches). No piece shall be detached from the inner surface of any spectacle component, and the lens shall be retained in the frame. In addition, the lens shall not fracture.

HIGH VELOCITY IMPACT

- High impact spectacles shall be capable of resisting impact from a 6.35 mm (0.25 inch) diameter steel ball traveling at a velocity of 45.7m/s (150 f/t) No contact with the eye of the head form is permitted as a result of impact. No piece shall be detached from the spectacle and the test lens shall be retained in the frame. In addition, the lens shall not fracture.



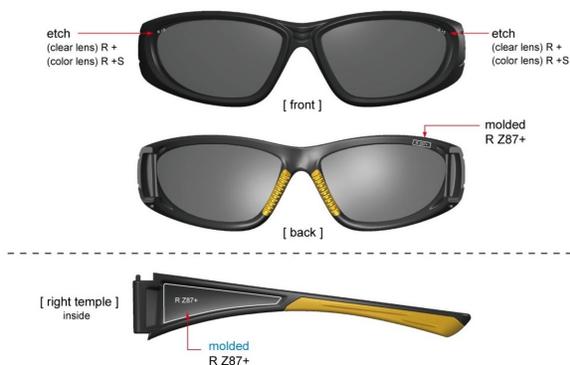
PENETRATION

- High impact spectacle lenses shall be capable of resisting penetration from a low mass pointed projectile dropped from a height of 127 cm (50 inches). The lens shall not be penetrated as a result of this test.



The new standard is a voluntary standard and there is no requirement or deadline that manufacturers or end users comply with it unless it is mandated by OSHA.

IF IT'S NOT MARKED Z87, IT'S NOT A SAFETY GLASS.



NEW MARKINGS REQUIREMENTS:

Lens markings:

- The 2015 revision requires a manufacturer's mark and, if the product is "Impact Rated", a "+" symbol.
- The 2015 revision requires "Optical Radiation" scale or shade markings for specific lens types (clear, welding, UV filter, visible light filter and IR filter).

Frame markings:

- The 2015 revision requires a manufacturer's mark plus Z87 and, if the product is "Impact Rated", a "+" symbol will follow the Z87. If the product is NOT "Impact Rated", the frame will only be marked with the manufacturer's mark plus Z87.

Each day, about 2,000 U.S. workers suffer a job-related eye injury requiring medical treatment, according to The National Institute for Occupational Safety and Health (NIOSH). In addition, roughly one third of these injuries require treatment in hospital emergency rooms, with 100 injuries resulting in one or more days of lost work.



90 percent of these injuries could have been prevented had the workers been wearing the proper eye protection, according to Prevent Blindness America, the nation's leading volunteer eye health and safety organization.

Eye injuries lead to 37,000 missed days of work and more than \$300 million per year in related costs, according to the U.S. Bureau of Labor Statistics. Non-compliance with protective eyewear is a serious issue in today's workplace, resulting in worker injury and hours of lost productivity.

Taking the proper steps to ensure compliance before an accident happens is the first step in protecting employees' eye health. Companies must take responsibility to learn the requirements, install the proper equipment and train facility managers and employees adequately.

- The best methods of eye protection differ for each type of hazard. The protector must be matched to the potential hazard. High risk occupations for eye injuries include: CONSTRUCTION, MANUFACTURING, MINING, CARPENTRY, AUTO REPAIR, ELECTRICAL WORK, PLUMBING, WELDING, MAINTENANCE, LAWN & GARDENING.
- Potential Eye Hazards Against Which Protection is Needed in the Workplace: PROJECTILES, CHEMICALS, RADIATION, BLOOD BORNE PATHOGENS. Some working conditions include multiple eye hazards. The proper eye protection takes all hazards into account.
- The type of safety eye protection you should wear depends on the hazards in your workplace:



..... If you are working in an area that has particles, flying objects, or dust, you must at least wear safety glasses. Safety glasses with side protection or foam linings enhance the level of protection.



..... If you are working with chemicals, you must wear goggles with indirect vents.



..... If you are working near hazardous radiation (welding, lasers, or fiber optics) you must use special-purpose safety glasses, goggles, face shields, or helmets designed for that task.

There are FOUR things you can do to protect your eyes from injury:

- 1** Know the eye safety dangers at your work.
- 2** Eliminate hazards before starting work by using machine guards, work screens or other engineering tools.
- 3** Use proper eye protection.
- 4** Keep safety eyewear in good condition and have it replaced if it becomes damaged.

What are some excuses for NOT wearing eye protection?

- Uncomfortable
- Lens Fogs Up
- They Look “goofy”
- Wear Prescription Glasses
- Don’t Think Eyewear is Necessary
- Wrong Lens for Conditions

Eye protection is only useful when the end-user actually wears it.

Questions to ask to identify proper eyewear

- Employees complaining about their eyewear?
- Worried you might not have the best equipment for the job?

Our expert safety consultants will conduct an in-house eyewear assessment for you checking for:

- Right job, right eyewear?
- Eye injuries occurring?
- Fit problems? (too big, too small, causing pain)
- Function problems? (lens fogging or scratching)
- Productivity enhancements through lens tint options (low light applications, IR exposure, inspection operations)

COMFORT. As many end-user’s are required to wear their eyewear for extended periods of time, comfort is an important issue. When a safety glass is comfortable to wear, the more likely the wearer is to use it on a regular basis.

STYLE / FASHION. As fashion tends to change rather quickly, market participants need to follow the trend and be ready to adjust their product offerings on short notice. Another trend to entice end-users to wear their eyewear is to offer logo and branded items.

PRICE. Influences purchases and budgets.

PROTECTION. The user wants the product to provide the maximum amount of protection from flying debris and hazards as well as protect the eye from damaging UV rays.

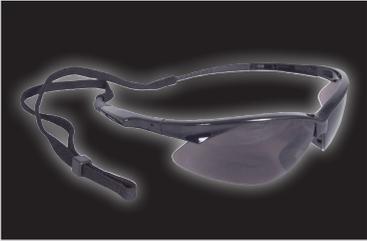
SPECIFIC APPLICATIONS. The right lens color, coatings and eyewear styles used in the proper job application can enhance the performance and productivity of the user.

Anti-Fog Coatings, Scratch Resistant coatings, Polarized Lens, Filter Lenses, Rx & Bi-Focal, OTG.

When to replace safety glasses?

There is no hard and fast rule on how frequently safety glasses should be replaced as this is influenced entirely by usage and the conditions to which the glasses are exposed. The most important issue is to ensure that a proper inspection takes place and that the user changes safety glasses as soon as any deterioration or damage is identified.

Neck Cords



Cleaning Stations



Carrying Case



FAQ:

Q. I wear contacts. They should provide enough protection, right?

A. Wrong. Contact lenses can be generally be used in the workplace but ONLY when worn with other appropriate eye protection.

Q. So how do I know which kind of eyewear I need at work? Are sideshields mandatory?

A. The answer to this question is highly reliant on the policies in place by your company and usually depends on the types of hazards you might face in your work environment. The ANSI and EN166 standard does not require defined side shields, but it does require a defined area around the eye be protected.

Q. Does protective eyewear that has scratches or pits need to be replaced? Shouldn't the lenses be made of high-grade industrial materials?

A. The answer is "absolutely" for both questions. Protective eyewear with scratched and pitted lenses or damaged frames are less resistant to impact and should be replaced. All protective eyewear should be cleaned, inspected, repaired and, if necessary, replaced on a regular basis. Polycarbonate is the most popular lens material and it is quite strong. In uncoated form, it is soft and prone to scratching. Coating the lens with a hardcoat makes it more durable and scratch resistant. Think of your eyewear as your own personal windshields for impact protection and clarity of sight.

Q. My vision is not 20-20. Do they make prescription protective eyewear?

A. Yes. Workers who need protective eyewear with corrective lenses must utilize special optical frames that, when fitted with corrective lenses, satisfy applicable ANSI and EN166 standards for protective eyewear. Better suppliers offer metal and plastic frames fitted with the appropriate prescription lenses. Full-service high-quality manufacturers provide, heavy-duty "carriers" that can be fitted with Rx lenses. Radians also offers OTG "over the glass" eyewear and safety goggles. These OTG styles fit comfortably over most prescription eyewear.

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