

ANSI Z87.1

Occupational and Educational Personal Eye and Face Protection Devices

This standard sets forth criteria related to the general requirements, testing, permanent marking, selection, care, and use of protectors to minimize the occurrence and severity or prevention of injuries from such hazards as impact, non-ionizing radiation and chemical exposures in occupational and educational environments including, but not limited to, machinery operations, material welding and cutting, chemical handling, and assembly operations.

Certain hazardous exposures are not covered in this standard. These include, but are not limited to: Bloodborne pathogens, X-rays, high energy particulate radiation, microwaves, radio-frequency radiation lasers, masers, and sports and recreation.

All safety glasses, goggles, and face shields' standard must include the following minimum requirements:

- Provide adequate protection against the hazards for which they are designed
- Be reasonably comfortable
- Fit securely, without interfering with movement or vision
- Be capable of being disinfected if necessary, and be easy to clean
- Be durable
- Fit over, or incorporate, prescription eyewear

ANSI Z87.1-2003

The 2003 version eye protection standard is a voluntary standard and there is no requirement that manufacturer or end user comply with it unless it is mandated by the United States Department of Labor–OSHA. However, in the past, most manufacturers have chosen to comply with revisions to the Z87.1 Standard.

OSHA requires (29 CFR 1910.133) that eye protectors comply with the 1989 version of the Z87.1 Standard, and eye protection devices now in use may continue to be used.

ANSI Z87.1-2003 Summary

1. Two Levels of Protection:

Basic and High

LENSES: The new standard designates that lenses will be divided into two protection levels, Basic Impact and High Impact as dictated by test criteria. Basic Impact lenses must pass the “drop ball” test, a 1" diameter steel ball is dropped on the lens from 50

inches. High Impact lenses must pass “high velocity” testing where 1/4" steel balls are “shot” at different velocities.

Spectacles: 150 ft./sec.

Goggles: 250 ft./sec.

Faceshields: 300 ft./sec.

FRAMES: Now, all eyewear/goggle frames, faceshields or crowns must comply with the High Impact requirement. (This revision helps eliminate the use of “test lenses”, and assures all protectors are tested as complete - lenses in frame - devices). After making an eye hazard assessment, employers (safety personnel) should decide on appropriate eyewear to be worn, although High Impact would always be recommended. All of our spectacles are High Impact protectors.

2. Now, Products Must Indicate:

Impact Protection Level

To identify a device’s level of impact protection, the following marking requirements apply to all new production spectacles, goggles and faceshields. Basic Impact spectacle lenses will have the manufacturer’s mark, i.e. an AOSafety product will have “AOS” and a Pyramex product will have a "P" etc. Goggles and faceshields will have AOS and Z87 (AOS Z87). High Impact spectacle lenses will also have a plus + sign, (AOS+) or "P+" etc. All goggle lenses and faceshield windows are to be marked with the manufacturer's mark, Z87, and a + sign (AOSZ87+).

Note: Lenses/windows may have additional markings. Shaded lens may have markings denoting a shade number such as 3.0, 5.0 etc. Special purpose lenses may be marked with “S”. A variable tint lens may have a “V” marking.

3. Sideshield Coverage Area Increased

Sideshield coverage, as part of the lens, part of the spectacle, or as an individual component, has been increased rearward by 10-millimeters via a revised impact test procedure. While side protection in the form of wraparound lens, integral or attached component sideshield devices is not mandated in this standard, it is highly recommended. Further, OSHA does require lateral protection on eye protection devices wherever a flying particle hazard may exist, and flying particle hazards are virtually always present in any occupational environment. All of our non-prescription safety spectacles meet the requirements of OSHA and the new Z87.1 for side protection.

4. No Minimum Lens

Thickness Requirement For High Impact Lenses

The new standard does not have a “minimum lens thickness” requirement for High Impact spectacle lenses. The previous standard required a 2-millimeter “minimum”.

However, the protective advantages of wrap-around lenses and the many other advancements in eyewear design have eliminated this need.

Note: Glass lenses still fall into the Basic Impact lens category. The “minimum lens thickness” of 3 millimeters remains in effect for this category.

ANSI Z87.1-2010

The Industrial Safety Equipment Association (ISEA), announced on April 13, 2010 that the American National Standards Institute (ANSI) approved a new Z87.1 standard. The new standard, titled “*ANSI/ISEA Z87.1-2010 American National Standard for Occupational and Educational Personal Face and Eye Protection*”

Since workers in almost every industry are exposed to hazards that could cause serious eye injuries, the changes in the revised standard are important.

Why is the Z87.1 standard changing?

Z87.1-2010 represents a change in the way the standard is organized and how users of eye and face protectors will utilize the standard to select products for specific hazards. The Z87.1-2003 standard and its predecessors were organized by the type of protector. In the process of revising Z87.1-2003, the Z87 Accredited Standards Committee (ASC) evaluated user needs, product variety and protection in an effort to write a document that provides more information for eye and face protection wearers. The Z87.1-2010 edition focuses on the hazard and is organized by the nature of the hazard such as droplet and splash, impact, optical radiation, dust, fine dust and mist.

How will the changes affect users?

The hazard approach in the standard will encourage users and employers to evaluate the specific hazards that they are exposed to in their environment and to select appropriate eye and face protection based on their hazard evaluation.

What are the significant changes in the revised standard?

Because the standard is radically different, the product markings have changed. Users will need to be educated on matching the hazard from which they need protection with the marking on the product. The Z87 ASC also made efforts to harmonize with other eye and face protection standards used around the world. Many of the tables in this standard reflect this effort to harmonize with global standards. Additional changes include:

- Extended side protection. Spectacles with thin temples (metal frame or thin plastic) will require side shields if they do not pass the extended side coverage requirements.
- In Z87.1-2003 protective products are marked as providing “Basic” or “High Impact” protection. In the Z87.1-2010 standard, the products are either non-impact or impact protectors. Products marked as impact protectors must pass all high-impact testing requirements and will be marked as “Z87+”. Non-impact protectors are those which do not pass all high-impact testing requirements and are therefore marked only with “Z87” (no “+” sign).

- In the Z87.1-2003 standard, protective products are defined as primary and secondary protectors; primary eye protection should be used under secondary protection (i.e., safety glasses must be worn under visors). This is changing in the Z87.1-2010 standard. Products such as faceshields and welding helmets, formerly considered secondary protectors, will now be either non-impact or impact protectors.
- Additional product testing has been added for:
 - Dust and mist goggles
 - Chemical splash goggles and visors
- New, additional product markings (*see below*)

New markings? What will they be and what do they mean?

The new standard requires that all non-impact and impact protectors carry markings as outlined in the standard. In addition to what is currently marked on products (manufacturer mark, standards/impact mark), manufacturers must add lens type (such as filter, visible light filter and variable tint) and use (i.e., protection against splash /droplet, dust and fine dust) when claims of impact rating, a specific lens type, and/or use are made by the manufacturer. For additional information on the markings, refer to the table below:

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When will employers have to comply with the revised standard?

On September 9, 2009 OSHA issued a Final Rule concerning 29 CFR (Part 1910 and others) that revised the personal protective equipment (PPE) requirements for eye and face protective devices, head protection and foot protection. The Final Rule incorporated the latest versions of national consensus and industry standards, such as those of the American National Standards Institute (ANSI). Additionally, OSHA also announced its use of "direct final rule" (i.e., the process used when no significant adverse comments are expected) to ensure that when standards change, the law is automatically updated. Therefore, the ANSI Z87.1-2010 standard should "automatically" be incorporated. Employers must comply with the Final Rule by using and providing for employees PPE that are constructed in accordance with any of the last three national consensus standards (ANSI Z87.1-2010, ANSI Z87.1-2003 and ANSI Z87.1-1989 [R-1998]) or their proven equivalent. Even though direct final rule applies, the process to actually incorporate ANSI Z87.1-2010 into the federal law may still take a while.