



## ANSI Z87.1-2010 NEW REQUIREMENTS FOR RX SAFETY EYEWEAR

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### INTRODUCTION

The new edition of the American National Standard for Occupational and Educational Eye and Face Protection, Z87.1, has been approved and issued as of April 13, 2010. The resultant document, ANSI/ISEA Z87.1 – 2010 updates the 2003 version. This revised standard has some significant changes that affect the prescription safety eyewear category. This document is focused on safety prescription eyewear, and is intended to alert you to some of the changes as well as other significant requirements.

For the first time, the ANSI Z87.1 Standard calls for testing by the manufacturers (laboratories) of protectors (complete devices – frame, lenses and shields) for safety Rx eyewear by specified types. This document will cover a few general requirements only. For a complete understanding of what will be required please contact the Optical Laboratories Association at: 800.477.5652.

In no way is this bulletin the authority or final word on these changes and requirements. In order to fully understand the new standard, we highly recommend you purchase a copy of the new standard from the International Safety Equipment Association's website at: <http://www.safetysafetyequipment.org>

### GENERAL COMMENTS

**New!** All of the former standards were organized around the *protector type* (spectacles, goggles, faceshields, etc.). The 2010 version is organized by *hazard type* and, as a result, product marking requirements have changed. There is also an ongoing effort by ANSI to more closely follow International standards where possible.

### SECTION 2 – APPLICATIONS

**New!** The protector manufacturer must provide test results to the purchaser upon request. The "protector" in this case is a complete device. **This means that a laboratory that processes safety Rx eyewear into a finished product for an individual will now be required to test specified types (eyewire designs) and provide test results when requested.**

**New!** Component manufacturers of safety frames will continue to be required to test and will now be required to provide test results when requested as well.

## SECTION 5 – GENERAL REQUIREMENTS

**New!** Ignition testing on all externally exposed materials is now required but ignition tests of textiles or elastic bands are **not** required.

**New!** Formerly, there was no specification for the soft tissue area around the eye that was to be protected by safety glasses. It was assumed that the position of the test “shots” would define this issue. This was found to be inadequate. Therefore, the new standard now has a **minimum coverage** area defined by a space of 40mm in width by 33mm in height in an elliptical shape centered over each eye and centered on the geometrical center of the lens. For smaller heads, this dimension changes to 34mm by 28mm and testing for the smaller size must be performed on the 54mm PD headform. Frames tested to the smaller size will require a special mark of the letter “H”.

**New!** Marking requirements have changed significantly: issues such as what marking is required, where the marking should be located and how it should be sequenced apply to both lenses and frames.

- **Lens markings for Rx:**
  - All lenses will have the manufacturer’s logo
  - Coverage for small heads will have: “H” (this pertains to rimless designs)
  - Impact rated will have a “+”
  - Specific lens types will need to be marked as noted:
    - Clear: no mark
    - Welding: “W” shade number
    - UV Filters: “U” scale number
    - Visible light filter: “L” number
    - IR Filter: “R” scale number
    - Variable tints: “V”
    - Special purpose: “S”
- **Frames and shield markings for Rx:**
  - All frames will have the manufacturer’s logo.
  - Size markings will be in accordance with ANSI Z80.5 – 2004 and will include the “A” dimension, DBL on the fronts with temple length on the temples.
  - **New!** Impact rated frames will be marked “Z87-2+” on the front and on one temple.
  - **New!** Small head tested frames will be marked with the letter “H”.
  - **New!** All detachable sideshields are to be marked “Z87 +” if impact rated.
- **New!** Sequence of markings:
  - **Frames** for Rx spectacles that are impact rated will be: manufacturer’s logo (“ABC”), Standard mark (“Z87-2”) and impact mark (“+”).
  - **Lenses** for Rx that are impact rated will be: Manufacturer’s logo (“ABC”), impact mark (“+”) and other special marks as indicated by lens type.

**New!** Aftermarket components not sold with the original device must be tested on the device for which it is intended. *For example, sideshields must be tested with test documentation made available upon request. The entity making the claim for the aftermarket device is responsible for the testing and documentation.*

## SECTION 6 – IMPACT PROTECTOR REQUIREMENTS

**New! Lateral (side) coverage** usually in the form of a fixed or detachable shield **will not** be allowed to have any openings larger in diameter than 1.5mm. Coverage will be lateral from the vertical plane of the lenses tangential to a point not less than 10mm posterior to the corneal plane and not less than 10mm in height (8mm for the small head form) above/below the horizontal plane.

**Protector failure criteria** will be based on any of the following:

- Piece fully detaches;
- Device fractures;
- Penetration of the rear surface;
- Lens not retained; or...
- For the high velocity test, if any piece of the device sticks to contact paste or if contact paste is on the projectile or on the complete device.

**High Mass and High Velocity Impact** forces to be tested remain essentially the same as the prior standard. The high mass pointed projectile is pointed and weighs 500 grams and is dropped from a height of 50 inches. The high velocity test uses a steel ball .25 inches in diameter that is fired at 150 feet per second at the lens in the test frame.

**New! Rx Lens Mounting Qualification:** this is a new requirement whereby the manufacturer of the complete device (the lab making the safety Rx glasses) will be required to test representative lens retention systems (lens bevel types as indicated below). These tests (both high mass and high velocity) are designed to qualify the different types of lens retention systems typically in use today as well as those that are developed in the future.

- Lens retention systems are defined as:
  - Full rim eyewires with “safety V bevels and other lens bevels” for metal frames.
  - Full rim eyewires with “safety V bevels and other lens bevels” for plastic frames.
  - Grooved metal frame (T-wires).
  - Grooved semi-rimless with half metal rim and suspension cord mountings.
  - Three piece drill-mounts.
  - Any other mounting system different than described above.
- These tests will be performed when any substantive change in production occurs that could affect the ability of the device to pass the tests.
- The tests will incorporate six high-velocity and four high-mass tests for each mounting system.

**New! Devices with Lift Fronts** will be impact tested with the lift front in the “up” position.

**New! Rx Lens Carriers behind Plano Protectors** shall meet the same impact requirements as other Rx devices if the plano protector is impact rated. Additionally, the tests will be performed with the Rx carrier glazed with lenses in plus and minus 5.00 diopters. The carriers must be marked with the manufacturer’s logo only and no other Z87 markings.

## ANSI Z87.1-2010 GENERAL INFORMATION

For copies of the new standard contact:

- International Safety Equipment Association  
<http://www.safetysafetyequipment.org>

Available Testing Labs:

- COLTS Laboratories  
702 Stevens Avenue  
Oldsmar, FL 34677  
Ph: 727.725.2323  
Email: [info@colts-laboratories.com](mailto:info@colts-laboratories.com)
- ICS Laboratories, Inc.  
1072 Industrial Parkway North  
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