

**Summary**

This new edition, ANSI/ISEA Z87.1-2010, replaces the Z87.1-2003 standard. As of the date of this summary, the Occupational Safety and Health Administration (OSHA) has not incorporated the 2010 standard into the eye and face protection regulation (29 CFR 1910.133)

The key changes to the eye and face protection standard include:

**1) A focus on the hazard**, rather than on the protector type, to encourage safety personnel and users to identify and evaluate specific hazards in their workplace such as Impact, Optical Radiation, Splash, Dust, and Fine Dust Particles. Therefore, under the revised standard, selection of the appropriate eye and face protective devices should be based on the hazard.

**2) New criteria for compliance:**

**Impact ratings:**

The 2003 version described two levels of protection: “Basic” & “High” impact protection. The 2010 revision describes devices to be either “Non Impact Rated” (complying to the impact requirements under “General Requirements”) or “Impact Rated” (complying to more stringent requirements within the revision).

**New headform for product testing:**

The 2003 version used the “Alderson” head form. The 2010 revision adopts the European (CE) small & medium headform sizes for testing to harmonize with existing international test methods.

**New test for splash/droplet, dust and fine dust:**

The 2003 version had no defined performance criteria for splash/droplet, dust or fine dust. The 2010 revision has specific performance and marking requirements for devices claiming to provide protection from splash/droplet, dust or fine dust hazards.

**Protection all the way**

At 3M, we believe that health and safety is the priority in any working environment, and that greater comfort and modern styles improve worker compliance. Therefore, we take care in adding comfort features where they are needed most, such as heavy contact areas like nose bridges and temple tips. The materials we choose to provide better comfort are designed to be durable to last and soft to the touch. We are also continually working on new coatings, new materials and new designs to bring the latest technology, innovation and fashion into our protective eyewear line.

For an official copy of the newly revised ANSI/ISEA Z87.1-2010 Standard go to:

<http://www.safetysite.com/c/stdz871-2010.cfm>

 <b>WARNING!</b>
<p><small>These eye and face protection products help provide limited eye and face protection. <b>Misuse or failure to follow warnings and instructions may result in serious potential injury, including blindness or death.</b> For proper use, selection, and applications against flying particles, optical radiation and / or splash see supervisor, read User Instructions and warnings on the package or call 3M OH&amp;ESD Technical Service in the USA at 1-800-243-4630. In Canada, call 1-800-267-4414.</small></p>



**Occupational Health & Environmental Safety Division**

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**ANSI Z87.1-2010 Standard Update for Non-Prescription Eye and Face Protective Devices\***

\* Safety prescription spectacle protective devices may have different requirements in some cases.



**ANSI Z87.1-2010 has been approved.**

The American National Standards Institute (ANSI) on April 13, 2010, approved a new edition of ANSI/ISEA Z87.1 titled “American National Standard Practice for Occupational and Educational Personal Eye and Face Protective Devices,” replacing the Z87.1-2003 version.

This summary of the revision of this eye and face protection standard focuses on the key changes to the standard; it does not represent any official or legal interpretation of the standard or even serve as a complete summary of the revision. If questions occur, the revised standard itself should be reviewed and relied on, rather than this summary. For an official copy of the newly revised ANSI/ISEA Z87.1-2010 Standard go to:

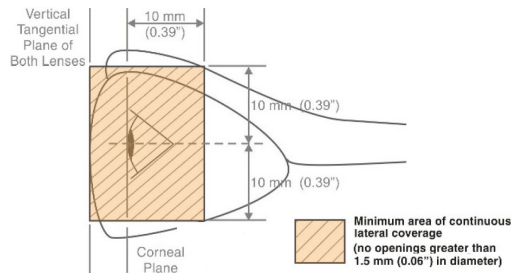
<http://www.safetysite.com/c/stdz871-2010.cfm>



**2) New criteria for compliance (cont):**

**Minimum coverage requirements:**

The 2003 version had no defined minimum coverage requirement. The 2010 revision has a minimum frontal requirement and, for an "Impact Rated" device, a lateral coverage requirement. In effect, this makes lateral coverage MANDATORY for an "Impact Rated" device.



**2) New criteria for compliance (cont):**

**New "Ignition" test:**

The 2010 revision eliminates the previous (2003) flammability test and replaces it with an ignition test which uses a hot steel rod contacting the protector to determine if the protector will ignite.

**3) New markings requirements:**

**Lens markings:**

The 2010 revision requires a manufacturer's mark and, if the product is "Impact Rated", a "+" symbol.

Example: "3M" only for non-Impact Rated product

Example: "3M+" for an Impact Rated product

**3) New markings requirements (cont):**

The 2010 revision requires "Optical Radiation" scale or shade marking. There are tables and markings for specific lens types (clear, welding, UV filter, visible light filter and IR filter).

Example: "3M+W3" for a spectacle welding lens with a shade 3.0 welding filter

**Frame markings:**

The 2010 revision requires a manufacturer's mark plus Z87 and, if the product is "Impact Rated", a "+" symbol will follow the Z87.

Example: "3M Z87+"

**3) New markings requirements (cont):**

If the product is NOT "Impact Rated", the frame will only be marked with the manufacturer's mark plus Z87  
Example: "3M Z87"

**4) New section on selection, use and maintenance.** This section provides guidance on hazard assessment and selection. It also includes a pull-out selection chart, showing recommended protectors for various types of work activities that can expose the worker to impact, heat, chemical, dust or optical radiation hazards.

**ANSI/ISEA Z87.1-2010  
Eye & Face Protector Selection Chart**

Protective devices do not provide unlimited protection. This information is intended to aid in identifying and selecting the types of eye and face protectors that are available, their capabilities and limitation for the hazards listed. This guide is not intended to be the sole referenced in selecting the proper eye and face protector.

This Selection Chart is intended to aid in identifying and selecting the types of eye and face protectors that are available, their capabilities and limitation for the hazard source operations listed. This guide is not intended to be the sole reference in selecting the proper eye and face protector.

Hazard	Protectors	Limitations	Marking <sup>1</sup>
<b>IMPACT - Chipping, grinding, machining, masonry work, riveting, and sanding</b>			
Flying fragments, objects, large chips, particles, sand, dirt, etc.	<ul style="list-style-type: none"> <li>Spectacles with side protection</li> <li>Goggles with direct or indirect ventilation</li> <li>Faceshield worn over spectacles or goggles</li> <li>Welding helmet</li> </ul>	Caution should be exercised in the use of metal frame protective devices in electrical hazard areas. Metal frame protective devices could potentially cause electrical shock and electrical burn through contact with, or thermal burns from exposure to the hazards of electrical energy, which include radiation from accidental arcs.  Atmospheric conditions and the restricted ventilation of a protector can cause lenses to fog. Frequent cleaning may be required.	Impact rated: + (spectacle lens) Z87+ (all other lens) Z87+ (plano frame) Z87.2+ (Rx frame)
<b>HEAT - Furnace operations - pouring, casting, hot dipping, gas cutting, and welding</b>			
Hot sparks	<ul style="list-style-type: none"> <li>Spectacles with side protection</li> <li>Goggles with direct or indirect ventilation</li> <li>Faceshields worn over spectacles or goggles</li> <li>Full-facepiece respirator</li> <li>Loose-fitting respirator worn over spectacles</li> </ul>	Spectacles, cup and cover type goggles do not provide unlimited facial protection.  Operations involving heat may also involve optical radiation. Protection from both hazards shall be provided.	
Splash from molten metal	<ul style="list-style-type: none"> <li>Faceshields worn over goggles</li> <li>Full-facepiece respirator</li> <li>Loose-fitting respirator worn over spectacles</li> </ul>		
High temperature exposure	<ul style="list-style-type: none"> <li>Screen faceshield over spectacles or goggles</li> <li>Reflective faceshield over spectacles or goggles</li> </ul>		
<b>CHEMICAL - Acid and chemical handling, degreasing, plating</b>			
Splash and irritating mists	<ul style="list-style-type: none"> <li>Goggles with indirect ventilation (eyecup or cover type)</li> <li>Faceshield worn over spectacles or goggles</li> <li>Full-facepiece respirator</li> </ul>	Atmospheric conditions and the restricted ventilation of a protector can cause lenses to fog. Frequent cleaning may be required.	Splash / droplet: D3

<sup>1</sup> Refer to ANSI/ISEA Z87.1-2010 table 4a for complete marking requirements

Hazard	Protectors	Limitations	Marking <sup>1</sup>
<b>DUST - Woodworking, buffing, general dusty conditions</b>			
Nuisance dust	<ul style="list-style-type: none"> <li>Goggles with direct or indirect ventilation (eyecup or cover type)</li> <li>Full-facepiece respirator</li> </ul>	Atmospheric conditions and the restricted ventilation of a protector can cause lenses to fog. Frequent cleaning may be required.	Dust: D4 Fine dust: D5
<b>OPTICAL RADIATION</b>			
Welding: Electric Arc Viewing electric arc furnaces and boilers	<ul style="list-style-type: none"> <li>Welding helmet over spectacles or goggles</li> <li>Handshield over spectacles or goggles</li> <li>TYPICAL FILTER LENS SHADE: 10-14</li> </ul>	Protection from optical radiation is directly related to filter lens density. Select the darkest shade that allows adequate task performance.  Note: Filter lenses shall meet the requirements for shade designations in table 6 of ANSI/ISEA Z87.1-2010.	Welding: W shade number UV: U scale number Glare: L scale number IR: R scale number Variable tint: V Special purpose: S
Welding: Gas Viewing gas-fired furnaces and boilers	<ul style="list-style-type: none"> <li>Welding helmet over spectacles or goggles</li> <li>Welding goggles</li> <li>Welding faceshield over spectacles or goggles</li> <li>TYPICAL FILTER LENS SHADE: 4-8</li> </ul>		
Cutting	<ul style="list-style-type: none"> <li>Welding goggles</li> <li>Welding helmet over spectacles or goggles</li> <li>Welding faceshield over spectacles or goggles</li> <li>Welding respirator</li> <li>TYPICAL FILTER LENS SHADE: 3-6</li> </ul>		
Torch brazing	<ul style="list-style-type: none"> <li>Welding goggles</li> <li>Welding helmet over spectacles or goggles</li> <li>Welding faceshield over spectacles or goggles</li> <li>TYPICAL FILTER LENS SHADE: 3-4</li> </ul>		
Torch soldering	<ul style="list-style-type: none"> <li>Spectacles</li> <li>Welding faceshield over spectacles</li> <li>Welding respirator</li> <li>TYPICAL FILTER LENS SHADE: 1.5-3</li> </ul>		
Glare	<ul style="list-style-type: none"> <li>Spectacles with or without side protection</li> <li>Faceshield over spectacles or goggles</li> </ul>	Shade or special purpose lenses, as suitable.  Note: Refer to definition of special purpose lenses in ANSI/ISEA Z87.1-2010.	