



Occupational Prescription Eyewear

# ANSI Z87.1–2003 for Safety Prescription Eyewear



Comparison between the old and  
new ANSI Z87.1 Standard



Sophisticated Style. Advanced Eye Protection.

# Comparison between the old and new ANSI Z87.1 Standard



ANSI Z87.1–1989 – Old	ANSI Z87.1–2003 – New
<b>Frame Tests</b>	
<p><b>High Mass Impact Test:</b></p> <ul style="list-style-type: none"> <li>• 500g weight (17.6oz) projectile</li> <li>• Dropped from a height of 130cm (51.2in)</li> <li>• 4 Test Samples</li> <li>• All must pass</li> </ul> <p><b>High Velocity Impact Test:</b></p> <ul style="list-style-type: none"> <li>• Impacted with 6.35mm (0.25in) steel ball</li> <li>• Velocity of steel ball 45.7 m/s (150 ft/s)</li> <li>• 20 Test Samples</li> <li>• 1 failure allowed</li> <li>• 3mm Lenses used for testing</li> </ul>	<p><b>High Mass Impact Test:</b></p> <ul style="list-style-type: none"> <li>• 500g weight (17.6oz) projectile</li> <li>• <b>Dropped from a height of 127cm (50in)</b></li> <li>• 4 Test Samples</li> <li>• All must pass</li> </ul> <p><b>High Velocity Impact Test:</b></p> <ul style="list-style-type: none"> <li>• Impacted with 6.35mm (0.25in) steel ball</li> <li>• Velocity of steel ball 45.7 m/s (150 ft/s)</li> <li>• 20 Test Samples</li> <li>• <b>0 failures allowed</b></li> <li>• <b>2mm Lenses used for testing</b></li> </ul>
<b>Lens Tests</b>	
<ul style="list-style-type: none"> <li>• 25.4mm (1 in) steel ball</li> <li>• Dropped from a height of 127cm (50 in)</li> <li>• The lens shall not fracture</li> <li>• Minimum thickness 3.0mm except for those lenses having a plus power of +3.00 D or greater shall have a minimum thickness no less than 2.5mm</li> <li>• <b>Plastic lenses only</b>— Penetration Test</li> <li>• 44.2gm (1.56oz) weighted projectile</li> <li>• Dropped from a height of 127cm (50 in)</li> <li>• Lens shall not fracture or be pierced</li> </ul>	<p><b>Lenses are divided into two categories:</b></p> <p><b>Basic Impact</b></p> <ul style="list-style-type: none"> <li>• 25.4mm (1 in) steel ball</li> <li>• Dropped from a height of 127cm (50 in)</li> <li>• The lens shall not fracture</li> <li>• Minimum thickness 3.0mm except for those lenses having a plus power of +3.00 D or greater shall have a minimum thickness no less than 2.5mm</li> <li>• <b>Plastic lenses only</b>—Penetration Test</li> <li>• 44.2gm (1.56oz) weighted projectile</li> <li>• Dropped from a height of 127cm (50 in)</li> <li>• Lens shall not fracture or be pierced</li> </ul> <p><b>High Impact</b></p> <ul style="list-style-type: none"> <li>• <b>Impacted with 6.35mm (0.25in) steel ball</b></li> <li>• <b>Velocity of steel ball 45.7 m/s (150 ft/s)</b></li> <li>• <b>Lens shall not fracture and no piece shall be detached from the inner surface</b></li> </ul> <p><i>* Special Note: Optical Laboratories must be certified to process High Impact Lenses</i></p> <ul style="list-style-type: none"> <li>• <b>Plastic lenses only</b>—Penetration Test</li> <li>• 44.2gm (1.56oz) weighted projectile</li> <li>• Dropped from a height of 127cm (50 in)</li> <li>• Lens shall not fracture or be pierced</li> </ul>



# Comparison between the old and new ANSI Z87.1 Standard



ANSI Z87.1–1989 – Old	ANSI Z87.1–2003 – New
<b>Lens Thickness</b>	
<ul style="list-style-type: none"> <li>• 3.0mm thick except lenses having plus power of +3.00D or more can have a minimum thickness of 2.5mm</li> </ul>	<p><b>Basic Impact</b></p> <ul style="list-style-type: none"> <li>• 3.0mm thick except lenses having plus power of +3.00D or more can have a minimum thickness of 2.5mm</li> </ul> <p><b>High Impact</b></p> <ul style="list-style-type: none"> <li>• High Impact lenses must not be less than 2.0mm thick.</li> </ul>
<b>Lens Marking</b>	
<ul style="list-style-type: none"> <li>• All markings shall be permanent, legible, and placed so that interference with the vision of the wearer is minimal</li> <li>• All lenses marked with manufacturer’s monogram</li> <li>• Filter lenses must be marked with applicable shade designation corresponding to Table 1</li> <li>• Special Purpose lenses must be marked with a “S”</li> <li>• Photochromic lenses must be marked with a “V”</li> </ul>	<ul style="list-style-type: none"> <li>• All markings shall be permanent, legible, and placed so that interference with the vision of the wearer is minimal</li> <li>• All lenses marked with manufacturer’s monogram</li> <li>• Filter lenses must be marked with applicable shade designation corresponding to Table 1</li> <li>• Special Purpose lenses must be marked with an “S”</li> <li>• Photochromic lenses must be marked with an “V”</li> <li>• High Impact lenses must be marked with a “+”</li> </ul>
<b>Frame Marking</b>	
<ul style="list-style-type: none"> <li>• All markings shall be permanent and legible</li> <li>• All major components shall be marked with the trademark identifying the manufacture</li> <li>• All major components shall be marked with Z87 to indicate compliance to the standard</li> <li>• Fronts shall be marked with the A-dimension and DBL (distance between lenses)</li> <li>• Temples shall be marked with their overall length</li> </ul>	<ul style="list-style-type: none"> <li>• All markings shall be permanent and legible</li> <li>• All major components shall be marked with the trademark identifying the manufacture</li> <li>• SRx frames including the front and temples shall be marked with Z87-2</li> <li>• Sideshields will continue to be marked Z87</li> <li>• Fronts shall be marked with the A-dimension and DBL (distance between lenses)</li> <li>• Temples shall be marked with their overall length</li> </ul>



# Comparison between the old and new ANSI Z87.1 Standard



ANSI Z87.1-1989 – Old	ANSI Z87.1-2003 – New
<b>Warning Labels</b>	
<ul style="list-style-type: none"> <li>No warning labels required</li> </ul>	<ul style="list-style-type: none"> <li>A warning shall be provided to alert the user when the lenses of a protector meets only the basic requirements of the standard</li> <li>A label or hang tag is to be affixed to the protector which does not meet the high impact requirements of the standard</li> <li>The warning label must contain an appropriate warning indicating that the lens meets basic impact requirements, but should not be used in high impact exposures</li> <li>The warning label should state that it is to be removed by the user</li> </ul>
<b>Sideshields</b>	
	<ul style="list-style-type: none"> <li>The new standard provides more lateral coverage from the sideshield</li> </ul>
<b>Corrosion</b>	
<ul style="list-style-type: none"> <li>Metal parts are boiled in a 10% aqueous solution of sodium chloride for 15 minutes. Then immersed in the same solution at room temperature, removed and allowed to dry for 24 hours. The metal parts are then rinsed in lukewarm water and allowed to dry. The function of the spectacles shall not be impaired by the corrosion</li> </ul>	<ul style="list-style-type: none"> <li>Metal parts are boiled in a 10% aqueous solution of sodium chloride for 15 minutes. Then immersed in the same solution at room temperature, removed and allowed to dry for 24 hours. The metal parts are then rinsed in lukewarm water and allowed to dry. The function of the spectacles shall not be impaired by the corrosion</li> </ul>
<b>Flammability</b>	
<ul style="list-style-type: none"> <li>The protector should not continue to burn after exposure to a 50mm flame for one and one-half seconds</li> </ul>	<ul style="list-style-type: none"> <li>The front, temple, lens and removable sideshields shall not burn at a rate greater than 76mm (3 in) per minute</li> </ul>

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