

# American National Standard

*for Ophthalmics –  
Prescription Spectacle Lenses*

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**Z80.1-2010**  
Revision of  
ANSI Z80.1-2005

American National Standard  
for Ophthalmics –  
Prescription Spectacle Lenses

Secretariat  
**The Vision Council**

Approved April 28, 2010  
**American National Standards Institute, Inc.**

# American National Standard

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**Foreword** (This foreword is not part of American National Standard ANSI Z80.1-2010.)

The Z80 Standards Committee for Ophthalmic Lenses was organized in 1956. Three separate standards were drafted, two relating to the manufacture of lenses and one to the fabrication of ophthalmic lenses into prescription eyewear. A standard relating mainly to lenses, but containing additional tolerances for a mounted pair, was issued in 1964. The tolerances were based largely upon an analysis of measured parameters in typical single-vision, mass-produced lenses assembled into conservatively styled and sized mountings. The standard represented the state-of-the-art for such lenses and a set of quality goals for lenses surfaced in the ophthalmic laboratory on an individual basis.

At the beginning of 1970, the Standards Committee Z80 was reorganized with the Optical Society of America, its former sponsor, serving as Secretariat. In 1972, the committee's scope was broadened to include lenses other than prescription glass ophthalmic lenses in recognition of the importance of plastic ophthalmic materials and the increased use of sunglasses and fashion eyewear. In the 1972 revision, certain tolerances for plastic and heat-treated lenses were relaxed in response to Federally mandated impact-resistant requirements for all ophthalmic lenses.

The 1979 revision reflected a shift in utilization from mass-produced lenses to a basic dependence upon custom-processed lenses at the laboratory level. It was an attempt to define the state-of-the-art in the manufacturing laboratory by recognizing the fact that, while individual tolerances may be reliably met, it is often not possible to achieve all requirements simultaneously. The Standard expressed desirable technical concepts that provided a framework for safety and effectiveness. The title was changed from a "requirement" to a "recommendation" to reflect the committee's intent.

In 1982, the Optical Laboratories Association assumed the responsibilities of the Secretariat. In 1985, the Z80 Committee became an Accredited Standards Committee.

The 1995 revision attempted to write the Z80.1 standard in a fashion consistent with ISO standards. This change included the practice of applying a tolerance to both meridional powers rather than sphere and cylinder as had been common practice. It was subsequently found that applying the ISO power tolerance method to custom fabricated eyewear resulted in unacceptably high rejection rates.

The 2005 revision recognized the need for change in the power tolerance methodology. This standard maintained the ISO approach to power tolerance, but used the highest meridian only rather than both meridians. For the first time since 1979, the mounted cylinder axis tolerance was adjusted based upon detailed scientific studies and a recognition of process capability and wearer needs. The difference in refractive power tolerance between progressive addition lenses and single vision and multifocal lenses reflected the fact that the tolerance on allowable cylinder in the semi-finished blank curvature for progressive addition lenses in ISO standards was looser than the tolerance on single vision and standard multifocals. The tolerance for cylinder axis used as its basis the amount of axis error that would be needed to result in an error of 0.12 D (the tolerance for cylinder refractive power). Additionally, the clause on the lens measurement method was rewritten to include automatic focimeters and better describe the method for measuring prism.

In January 2009, the Vision Council assumed responsibility for Secretariat.

This 2010 revision includes several important areas of revision. The first change relates to a transmission power tolerance, where the practice of using the sphere and cylinder (when expressed in minus notation) is again utilized. Two durability require-

ments for this revision were adapted from published ISO standards; Specifications and test methods for anti-reflective coatings and Minimum requirements for spectacle lens surfaces claimed to be abrasion resistant.

The standard remains a recommendation. Therefore, it is the specific intent of the Z80 Committee that this standard not be used as a regulatory instrument.

This standard contains five informative annexes, which are not considered part of the standard.

Suggestions for improvement of this standard will be welcome. They should be sent to The Vision Council, 1700 Diagonal Road, Suite 500, Alexandria, VA 22314.

This standard was processed and approved for submittal to ANSI by the Accredited Standards Committee Z80 (ASC Z80). Committee approval of this standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, ASC Z80 had the following members:

Thomas C. White, M.D., Chairman  
 Quido Cappelli, Vice-Chairman  
 Robert Rosenberg, O.D., Secretary

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The Subcommittee on Prescription Ophthalmic Lenses, which developed this standard, had the following members at the time of approval:

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Joe DeZeno	Neil Roche
Steven Drake	Robert Rosenberg
Jeff Endres	Lyle Rubin
Kenneth Frederick	Jonathan Schwartz
David Hilber	Rick Tinson
Herbert Hoover	Rick Van Arnam
Susie Leshner	Michael Vitale
Scott MacGuffie	Jeff Weaver
Darin McCormack	Richard Whitney
Darryl Meister	Kenneth Wood

## American National Standard for Ophthalmics –

# Prescription Spectacle Lenses

## 1 Scope and Purpose

### 1.1 Scope

This standard applies to the processing of all prescription ophthalmic spectacle lenses in edged or assembled form. It is a processing guideline for optical laboratories applicable to prescription eyewear prior to transfer for dispensing and for the dispenser prior to the delivery of the finished eyewear to the patient. Relevant optical specifications and tolerances of this standard should apply also to uncut lenses supplied by an optical laboratory to be used in filling a specific prescription.

This standard does not apply to products covered by *American National Standard for Ophthalmics - Nonprescription Sunglass and Fashion Eyewear Requirements*, ANSI Z80.3-2009.

### 1.2 Purpose

This standard reflects the shift in utilization from mass-produced lenses to a basic dependence upon custom-processed lenses at the laboratory level. It does not represent tolerances that describe the state-of-the-art of the ophthalmic laboratory, but provides quality goals for new pristine lenses prepared to individual prescription. The individual performance parameters listed in this standard can be achieved reliably. However, it is difficult to meet all of the requirements simultaneously in any given lens or mounted pair. The fact that, under rigorous application of this standard, a significant number of spectacles (approximately 25%, based upon industry data) will not achieve all parameters simultaneously, must be accepted as a reflection of the state-of-the-art. As such, this standard expresses desirable technical concepts that provide a frame of reference for safety and effectiveness and is not designed as a regulatory instrument.