American National Standard

for Ophthalmics –

Prescription Ophthalmic Lenses – Recommendations

ANSI Z80.1-2025

Approved American National Standard

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American National Standard
for Ophthalmics –

Prescription Ophthalmic Lenses – Recommendations

Secretariat

The Vision Council

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Developed by

The Accredited Committee Z80 for Ophthalmic Standards -

The Vision Council
Z80 Secretariat
225 Reinekers Lane
Suite 700
Alexandria, VA 22314

Published by

The Vision Council
225 Reinekers Lane
Suite 700
Alexandria, VA 22314

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Foreword (This foreword is not part of American National Standard ANSI Z80.1-2025.)

Summary of Changes to ANSI Z80.1 for 2025

This 2025 revision represents the most current consensus of experts in this field. The changes from the 2020 standard are the result of a thorough study by the ANSI Z80.1 committee of the relevance and applicability of its contents.

Summary of key items included in this revision (2025)

The committee reviewed comments and input received from past revisions and sought input from users of the standard. As a result, a number of important revisions were made:

- **Section 5.1.1.1**
  Made a distinction for lenses which have 1 vs. 2 verification points. Non-traditional Single Vision lenses are being sold as such, resulting in market confusion. This distinction permits categorizing and tolerancing lenses. The Power Variation lens category includes Progressives, but also designs which are treated as single vision if they have one verification point, regardless of design.

- **Section 5.1.4 (Table 5)**
  Provided a practical prism tolerance to be applied to low power, high prism prescriptions. This table is new to this revision.

- **5.1.7 Localized errors**
  Revised the description of Localized power errors to exclude design variations and are meant to apply to processing/fabrication errors.

- **7.2.2 Claims for Transmittance Attenuation for Wavelengths Longer than 380 nm**
  Revised Transmittance attenuation tolerance for wavelength claim at <380 nm to reflect measurement capabilities The 2020 Standard tolerance was replaced to mirror ISO 8080 (as yet unpublished); studies deemed this change to be more practical. Section 8.14 (Measurement of Spectral Transmittance) was also added to improve consistency and accuracy of claim.

- **Annex D – Optical and Mechanical Tolerances Summary**
  This table is replicated by The Vision Council and published without charge. Given many users only see this, verbiage at the beginning was added to help direct and suggest purchase of the full standard.

Background and Summary of Past revisions for ANSI Z80.1

The Z80 Standards Committee for Ophthalmic Lenses was organized in 1956.

A standard relating mainly to lenses, but containing additional tolerances for a mounted pair, was issued in 1964.

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.

Subsequent past revisions were:

ANSI Z80.1-1979, The title was changed from requirement to recommendation. Shifted to mass produced lenses, away from factory finished.

ANSI Z80.1-1987, More definitions, tutorials, and UV absorbance in lens materials was first addressed.

ANSI Z80.1-1995, Adopted tight ISO power tolerances of tolerancing both meridians.

ANSI Z80.1-1999, Power tolerances adjusted but did not eliminate ISO power tolerance approach, revised prism measurement, and tolerancing sections.

ANSI Z80.1-2005, Significant change to the Axis angle tolerance was made in the area of weak cylinder power.

ANSI Z80.1-2010, Reverted to practical power tolerance method of sphere and cylinder differences.

ANSI Z80.1-2015, Addressed Position of Wear and tolerancing compensated lenses, added to lens marking recommendations, added a recommendation for minimum transmittance when to close loophole for prescription lenses.

ANSI Z80.1-2020, Addressed transmittance claims, included new terms and product classifications, provided guidance on handling localized power errors, and added annexes discussing focimeter capabilities and measuring unintended prismatic imbalance.

Suggestions for improvement of this standard will be welcome. They should be sent to the Vision Council, 225 Reinekers Lane, Suite 700, Alexandria, VA 22314.

This standard was processed and approved for submittal to ANSI by the Accredited Standards Committee on Ophthalmic Optics, Z80. Committee approval of this standard does not necessarily imply that all committee members voted for its approval. At the time of approval of this standard, the Z80 Committee consisted of the following members:

Dr. Carl Tubbs, MD, Chair
Lauren Bianchi, Vice-Chair
Dr. Karl Citek, OD, PhD, Secretary
Michael Vitale, Secretariat

Organization Represented	*Name of Representative*
Advanced Medical Technology Association	Michael Pfleger
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American Optometric Association	Karl Citek
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Optical Laboratory Association	Neil Torgersen
Sunglass Association of America	Rick Van Arnam
The Vision Council	Michael Vitale
United Opticians Association, Inc.	Tom Hicks
ISO TC 172/SC7	Michael Vitale

Members of the Subcommittee on Prescription Spectacle Lenses who contributed to this edition of the standard are:

Richard Whitney, Chair
Rick Tinson, Vice-Chair
Dr. Karl Citek, OD, Secretary

Emmanuel Alabi	Adam Mancuso	David Sliney
Ramzi Ari	Mark Mattison-Shupnick	Jeremy Swan
Lauren Bianchi	Brent McCardle	Neil Torgersen
Carl Buckholt	Dale Pfriem	Michael Vitale
Keith Cross	Neil Roche	Greg Williams
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Tom Hicks	Robert Shanbaum	
Daniel Lahousse	Daniel Simonetta	

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1 Scope and Purpose

1.1 Scope

This standard applies to all prescription dress ophthalmic spectacle lenses in edged or assembled form. It is a guideline for entities that fabricate, assemble or process dress eyewear or lens components. Relevant optical and physical specifications and tolerances of this standard also apply to uncut lenses.

This standard specifically excludes products covered by ANSI Z80.3, ANSI Z87, ANSI Z136.7, and sports and recreational protective eyewear covered within the ASTM F08.57 committee.

1.2 Purpose

This standard reflects the shift in utilization from mass-produced lenses to a basic dependence upon custom-processed lenses. It provides minimum acceptable tolerances for new lenses prepared to an individual prescription.

The power, prism, and axis tolerances established in this standard are subject to measurement limitations associated with the accuracy and repeatability of the current state-of-the-art focimetry and other measurements commonly in use by laboratory technicians and eyecare professionals. Users should therefore take into account the measurement capability of the devices (and methodology) when applying tolerances to the spectacle lens. As such, this voluntary standard expresses technical concepts that provide a frame of reference for safety and effectiveness. Refer to Annex F for additional guidance on this topic.

2 Normative References

The following standards contain provisions that, through reference in this text, constitute provisions of this American National Standard. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to apply the most recent editions of the standards indicated below.

ANSI Z80.3, *Nonprescription Sunglass and Fashion Eyewear Requirements*.[1]

ANSI Z80.17, *Focimeters*[1]

ANSI Z87.1, *Occupational and Educational Eye and Face Protection Devices*[1]

[1] Available from the American National Standards Institute, 1180 Avenue of the Americas, 10th Floor, New York, NY 10036 (Website: webstore.ansi.org).