American National Standard

for Ophthalmics –

Prescription Ophthalmic Lenses – Recommendations

ANSI Z80.1-2020

Approved American National Standard

ANSI

ANSI®
Z80.1-2020
Revision of
ANSI Z80.1-2015

American National Standard
for Ophthalmics –

Prescription Ophthalmic Lenses – Recommendations

Secretariat

The Vision Council

Approved December 22, 2020
Published April 1, 2021

American National Standards Institute, Inc.

American National Standard

Approval of an American National Standard requires review by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

Consensus is established when, in the judgement of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made towards their resolution.

The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he has approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this standard. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

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

Printed in the United States of America

Contents

Foreword (This foreword is not part of American National Standard ANSI Z80.1-2020.)

Summary of Changes to ANSI Z80.1 for 2020

This 2020 revision represents the most current consensus of experts in this field. The changes from the 2015 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 (2020)

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:

- Methods to address claims in the area of Transmittance were included. Recommendations on standardizing claims for attenuation at given wavelengths (such as 400 nm) and products that selectively attenuate specific wavelengths (such as Blue light);
- New terms and product classifications, including Power Variation lenses and specialized assistive lenses and their tolerances
- Guidance on how to handle localized power errors;
- New Annex F to address focimeter capabilities;
- New Annex G to address unintended prismatic imbalance.

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.

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, Chairman
Nick Mileti, Vice-Chairman
Dr. Karl Citek, OD, Secretary
Michael Vitale, Secretariat

Organization Represented	*Name of Representative*
Advanced Medical Technology Association	Michael Pfleger
American Academy of Ophthalmology	Carl Tubbs
American Academy of Optometry	David Loshin
American Ceramic Society	Lyle Rubin
American Glaucoma Society	Steven Gedde
American Optometric Association	Karl Citek
American Society of Cataract and Refractive Surgery	Stephen Klyce
Contact Lens Institute	Stan Rogaski
Contact Lens Manufacturers Association	Martin Dalsing
Cornea Society	Michael Belin
Department of Veterans Affairs	John Townsend
Food & Drug Administration CDRH/Division	Don Calogero
Individual	Ralph Stone
Johnson & Johnson Vision	Nick Tarantino
Medical Device Manufacturers Association	James Saviola
National Association of Optometrists & Opticians	Nick Mileti
Optical Laboratory Association	Neil Torgersen
Opticians Association of America	Tom Hicks
Sunglass Association of America	Tibor Gross
The Vision Council	Michael Vitale
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	Brent McCardle	David Sliney
Lauren Bianchi	Mark Mattison-Shupnick	Jeremy Swan
Carl Buckholt	Nick Mileti	Neil Torgersen
Keith Cross	Dale Pfriem	Michael Vitale
Alfredo Duenez	Ramzi Ari	Paul Wade
Pete Hanlin	Neil Roche	Greg Williams
Tom Hicks	Lyle Rubin	Carrie Wilson
Daniel Lahousse	Robert Shanbaum	
Adam Mancuso	Daniel Simonetta	

American National Standard for Ophthalmics –

Prescription Ophthalmic Lenses – Recommendations

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.