

ANSI Z80.23-2018

# American National Standard

*for Ophthalmics –  
Corneal Topography and  
Tomography Systems –  
Standard Terminology, Requirements*

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American National Standard  
for Ophthalmics –  
Corneal Topography and  
Tomography Systems –  
Standard Terminology, Requirements

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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

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Suite 700  
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**Foreword** (This foreword is not part of American National Standard ANSI Z80.23-2018.)

This American National Standard continues to address the expressed needs of those members of the ophthalmic community who use corneal topography in clinical settings, those who manufacture corneal topographers and those who teach others in the use of the information collected by corneal topographers. In particular, there continues to be a need for standardization of the terms and definitions used in the field, for standardization of the methods used for characterizing the performance of these instruments and for standardization of displays of corneal topographical information. The experts who worked together to initially create this standard felt that, at the time, there was not sufficient consensus within the ophthalmic community to set performance requirements for these instruments beyond those for minimum area measured and measurement sample density. Later, in working with international experts in the field, it was decided that instruments should be tested on a selected set of test surfaces to ensure that the calibration to set their scale factors had been done correctly. The standard continues to address standardization of the methods for testing these instruments, for assessing their performance, and for reporting the results thus obtained.

The number and type of test surfaces to be used has been changed to include only test surfaces for which the results can be verified. When these surfaces are tilted or rotated the expected surface measurements are easy to predict. These surfaces were considered to be adequate as minimum verification surfaces for corneal topographers; if a corneal topography system can measure these surfaces well, it will be a clinically useful instrument. The method for standardization of color maps has been changed in an effort to improve the user's ability to discern just-noticeable differences in corneal topography. The user always has the option of using a scale with less resolution but with greater range, as long as the scale recommended in this document is available to be used.

This standard contains four annexes. Annex A is informative and is not considered part of this standard. Annexes B through D are normative and are considered part of this standard.

This standard was created by a special working group created by the Z80 Subcommittee on Ophthalmic Instruments and included experts in the field of corneal topography from the clinical, manufacturing and academic areas of the ophthalmic community. 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 Ophthalmics, 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, the Z80 Committee had the following members:

Carl Tubbs, M.D., Chairman  
Neal Roche, Vice-Chairman  
William Benjamin, O.D., Secretary  
Michael Vitale, Secretariat

<i>Organization Represented</i>	<i>Name of Representative</i>
Advanced Medical Technology Association .....	Michael Pflieger
American Academy of Ophthalmology .....	Carl Tubbs
American Academy of Optometry .....	David Loshin
American Ceramic Society .....	Lyle Rubin
American Glaucoma Society .....	Steven Gedde
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Opticians Association of America .....	Tom Hicks
Sunglass Association of America .....	Tibor Gross
The Vision Council.....	Michael Vitale
ISO TC 172/SC7 .....	Michael Vitale

*Individual Member*

Ralph Stone

The members of the subcommittee on Ophthalmic Instruments who contributed to this standard are:

Charles E. Campbell, Chair  
William L. Brown, O.D., Ph.D,  
Karl Citek, O.D. Ph.D.  
Bruce Drum, Ph.D.  
Stephen Farrer  
Stephen Klyce, Ph.D.  
Dexiu Shi, Ph.D.  
David Sliney, Ph.D.  
Robert Rosenberg, O.D.

American National Standard  
for Ophthalmics –

# Corneal Topography and Tomography Systems – Standard Terminology, Requirements

## 1 Scope and purpose

### 1.1 Scope

This American National Standard applies to instruments, systems and methods that are intended to measure the shape of the cornea of the human eye over a majority of its area. The measurements of the anterior and/or posterior surface in local areas may be of curvature and/or three dimensional topographical measurements of the surface. The measurements may be used to derive more global parameters used to characterize the surfaces. Instruments classified as ophthalmometers or keratometers are not covered by this standard.

### 1.2 Purpose

This standard defines certain terms that are peculiar to the characterization of the corneal shape so that they may be standardized throughout the field of vision care and have common meaning for all those who have occasion to participate in this area.

This standard sets forth minimum requirements for instruments and systems that fall into the class of corneal topographers.

This standard sets forth tests and verification procedures that will verify that a system or instrument complies with the standard and so qualifies as a corneal topographer or corneal tomographer in the meaning of this standard.

This standard sets forth certain tests and verification procedures that will allow the verification of capabilities of systems that are beyond the minimum required for corneal topographers or corneal tomographers.

## 2 Normative references

The following standard contains provisions that, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ANSI Z80.20-2004, *Ophthalmics – Contact Lenses – Standard terminology, tolerances, measurements and physicochemical properties*<sup>1)</sup>

ANSI Z80.28-2017, *Ophthalmic Instruments – Methods for reporting optical aberrations of eyes*<sup>1)</sup>

ISO 8429:1986, *Optics and optical instruments – Ophthalmology – Gradual dial scale*<sup>1)</sup>

<sup>1)</sup> For electronic copies of some standards, visit ANSI's Electronic Standards Store (ESS) at [www.ansi.org](http://www.ansi.org). For printed versions of all these standards, contact Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112-5704, (800) 854-7179.