American National Standard

for Ophthalmics –
Instruments – General-Purpose Clinical Visual Acuity Charts

ANSI Z80.21-2020

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for Ophthalmics –

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Foreword (This foreword is not part of American National Standard ANSI Z80.21-2020.)

This American National Standard addresses the optical design of optotypes used in clinical visual acuity measurement systems that use recognition of high and low contrast optotypes and that are designed for general use.

ANSI Z80.21-2020 was adapted by a group of experts within the ANSI Ophthalmic Instruments Subcommittee under the chairmanship of Charles E. Campbell. It is a performance standard.

The substantive changes in this document compared to the previous 2015 edition are:

a) Low contrast acuity charts are now included in the scope of the standard and specifications were added for these charts

b) Definitions were added to define contrast, both high and low, as used in this standard

c) Specifications for electronic displays were added with special marking requirements for them

d) A formula for calculating acuity scores when using the Bailey Lovie or EDTRS charts was added

e) In Annex A the requirement for the number of Landolt ring orientations to use was changed from 8 to 4

f) Informative Annex B was added to specify Sloan and British Standard Institute optotypes

This standard contains three annexes. Annex A, which is normative, is considered part of this standard. Annex B and Annex C, which are informative, are not considered part of this standard.

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:

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Nick Mileti, Vice-Chairman
William Benjamin, O.D., Secretary
Michael Vitale, Secretariat

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American Academy of Ophthalmology	Carl Tubbs
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1 Scope and purpose

1.1 Scope

This standard applies to displays of optotypes for all clinical visual acuity measurement systems that use recognition of optotypes and that are designed for general use including optotypes printed on opaque media, those intended for transillumination, electronically generated or projected displays. It does not apply to special testing of visual acuity, e.g., low-vision, or reverse polarity (e.g., white optotype on a dark background).

1.2 Purpose

The principles of standardized visual acuity testing are presented in standards adopted by the National Academy of Sciences and the Consilium Ophthalmologicum Universal as referenced below. Due to practical design considerations and physical limitations of most general-purpose clinical visual acuity measurement systems, the chart design features specified in these reference standards can only be met for a limited range of acuity presentations. Specialized charts are often required for special clinic visual acuity measurements – such as for low-vision patients. The purpose of this standard is to provide for standardized visual acuity charts for general measurement, which will enable the measurement of visual acuity over a limited, but clinically useful, range of acuities according to the principles contained in the reference standards. These standardized charts are also widely used for clinical trials whose purpose is to evaluate the performance of ophthalmic devices.