This is a free 26 page sample. Access the full version online.

Irish Standard
I.S. EN ISO 8596:2018

Ophthalmic optics - Visual acuity testing -- Standard and clinical optotypes and their presentation (ISO 8596:2017)

© CEN 2018 No copying without NSAI permission except as permitted by copyright law.

I.S. EN ISO 8596:2018

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:	*Published:*
EN ISO 8596:2018	2018-01-24

This document was published under the authority of the NSAI and comes into effect on:	ICS number:
2018-02-12	11.040.70
	NOTE: If blank see CEN/CENELEC cover page

NSAI	T +353 1 807 3800	Sales:
1 Swift Square,	F +353 1 807 3838	T +353 1 857 6730
Northwood, Santry	E standards@nsai.ie	F +353 1 857 6729
Dublin 9	W NSAI.ie	W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

This is a free 26 page sample. Access the full version online.

National Foreword

I.S. EN ISO 8596:2018 is the adopted Irish version of the European Document EN ISO 8596:2018, Ophthalmic optics - Visual acuity testing -- Standard and clinical optotypes and their presentation (ISO 8596:2017)

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

For relationships with other publications refer to the NSAI web store.

Compliance with this document does not of itself confer immunity from legal obligations.

In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

This is a free 26 page sample. Access the full version online.

This is a free 26 page sample. Access the full version online.

This page is intentionally left blank

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 8596

January 2018

ICS 11.040.70

Supersedes EN ISO 8596:2009

English Version

Ophthalmic optics - Visual acuity testing -- Standard and clinical optotypes and their presentation (ISO 8596:2017)

Optique ophtalmique - Mesure de l'acuité visuelle - Optotype normalisé et optotypes cliniques et leur présentation (ISO 8596:2017)

Augenoptik - Sehschärfeprüfung - Normsehzeichen und klinische Sehzeichen und ihre Darbietung (ISO 8596:2017)

This European Standard was approved by CEN on 20 November 2017.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

This is a free 26 page sample. Access the full version online.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2018 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN ISO 8596:2018 E

Contents

Page

European foreword..... 3

This is a free 26 page sample. Access the full version online.

European foreword

This document (EN ISO 8596:2018) has been prepared by Technical Committee ISO/TC 172 “Optics and photonics” in collaboration with Technical Committee CEN/TC 170 “Ophthalmic optics” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2018, and conflicting national standards shall be withdrawn at the latest by July 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 8596:2009.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 8596:2017 has been approved by CEN as EN ISO 8596:2018 without any modification.

This is a free 26 page sample. Access the full version online.

This is a free 26 page sample. Access the full version online.

This page is intentionally left blank

I.S. EN ISO 8596:2018

INTERNATIONAL STANDARD

ISO 8596

Third edition
2017-11

Ophthalmic optics — Visual acuity testing — Standard and clinical optotypes and their presentation

Optique ophtalmique — Mesure de l'acuité visuelle — Optotype normalisé et optotypes cliniques et leur présentation

Reference number
ISO 8596:2017(E)

© ISO 2017

This is a free 26 page sample. Access the full version online.

This is a free 26 page sample. Access the full version online.

COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

 © ISO 2017 – All rights reserved

Contents

Page

Foreword ..... **iv**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Requirements **2**
4.1 Specifications of the standard optotype 2
4.2 Visual acuity grades and standard optotype grades 3
4.3 Test area and spacing between standard optotypes 4
4.4 Positions of the optotype 4
4.5 Quality of presentation 4
4.6 Luminance 5

5 Test methods **6**
5.1 Viewing distance for distance visual acuity testing 6
5.2 Criteria for determination and assignment of visual acuity grade 6

6 Test report **6**

Annex A (informative) **Optotypes for clinical investigations** **7**

Bibliography **10**

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 7, *Ophthalmic optics and instruments*.

This third edition cancels and replaces the second edition (ISO 8596:2009), which has been technically revised.

The main changes compared to the previous edition are as follows:

a) restructuring of technical content into the Clauses 4 and 6 has been applied;

b) terms and definitions with the terms standard optotype, clinical optotype, visual acuity, and the systems decimal visual acuity, Snellen fraction, LogMAR acuity, and visual acuity grade have been added;

c) Snellen fraction values in Table 1 have been added;

d) Figure 2 has been added;

e) Annex A has been added.

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

INTERNATIONAL STANDARD ISO 8596:2017(E)

Ophthalmic optics — Visual acuity testing — Standard and clinical optotypes and their presentation

1 Scope

This document specifies a range of Landolt ring optotypes and describes a method for measuring distance visual acuity under photopic conditions for the purposes of certification or licensing.

This document is neither intended as a standard for clinical measurements nor for the certification of blindness or partial sight.

Other optotypes used for clinical investigations are described in Annex A for information.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3:1973, *Preferred numbers — Series of preferred numbers*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
standard optotype
Landolt ring

Note 1 to entry: The Landolt ring is specified in Table 1 and Figure 1.

3.2
clinical optotype
optotype other than the *standard optotype* (3.1) used for measuring *visual acuity* (3.3)

Note 1 to entry: This definition does not exclude the standard optotype from being used for the same purposes as a clinical optotype.

Note 2 to entry: Since clinical optotypes can differ greatly in legibility, it is crucial to refer to the standard optotype whenever the comparability of the results is important. ISO/TR 19498 provides a method for correlation of clinical optotypes to the standard optotype.

3.3
visual acuity
number characterizing the ability of the visual system to recognize optotypes

Note 1 to entry: Currently, three different scaling systems are used to describe the visual acuity of a patient. These are decimal visual acuity, Snellen fraction, LogMAR acuity. See Table 1.

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

3.3.1
decimal visual acuity
reciprocal of the minimum recognizable gap width of a Landolt ring measured in minutes of arc

EXAMPLE A visual acuity of 1,0 is assigned when the smallest Landolt ring recognized by a patient has a gap width of 1 min of arc measured from the patient's viewing distance.

3.3.2
Snellen fraction
notation for specifying the angular subtense of an optotype, expressed as a fraction with the numerator (test distance) being the distance at which *visual acuity* (3.3) is tested, commonly in m or ft, and the denominator (normal distance) being the distance at which the critical detail (limb) of the smallest recognizable optotype subtends 1 min of arc

$$V_{\mathrm{Sn}} = \frac{D_{\mathrm{t}}}{D_{\mathrm{n}}}$$

where

V_{Sn} is the visual acuity, measured as Snellen fraction;

D_{t} is the test distance, measured in m or ft;

D_{n} is the normal distance, measured in m or ft.

EXAMPLE A Snellen fraction of 6/6 is assigned to the visual resolving power of a patient, when the smallest recognizable Landolt ring has a gap size of 1 min of arc from a viewing distance of 6,0 m.

Note 1 to entry: The decimal visual acuity can by calculated from the Snellen fraction by evaluating the above quotient (e.g. Snellen fraction 6/6 = decimal visual acuity 1,0).

3.3.3
LogMAR acuity
logarithm (base 10) of the minimum angle of resolution measured in minutes of arc

Note 1 to entry: LogMAR acuity can be converted to *decimal visual acuity* (3.3.1) by:

$$\text{Decimal visual acuity} = 10^{(-\text{LogMAR acuity})}$$

3.4
visual acuity grade
number assigned to an optotype that is equal to the minimum visual acuity of a patient necessary to recognize the optotype from a specified distance

Note 1 to entry: The standardized visual acuity grades used in the three different scaling systems are given in Table 1.

4 Requirements

4.1 Specifications of the standard optotype

The Landolt ring is detailed in Table 1 and shown in Figure 1.

The decimal visual acuity grade 1 shall be represented by a Landolt ring whose outer diameter, *d*, subtends an angle of 5 min of arc and whose width, as well as the gap in its continuity, subtends an angle of 1 min of arc at the designated viewing distance.

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

The Landolt ring shall be capable of being presented with eight different gap orientations, including left and right horizontal orientations, upper and lower vertical orientations, and the four principal diagonal orientations.

4.2 Visual acuity grades and standard optotype grades

The visual acuity grades shall be as given in Table 1. The gap size of the standard optotype shall be graduated logarithmically. The quotient of the size of the optotype and that of the next smaller one shall be

$\sqrt[10]{10} = 1{,}2589$ (series of preferred numbers R10 from ISO 3:1973)

Optotypes of decimal acuity grades 0,05, 0,06, 0,08 and 2,0 may be omitted if necessary. Use of additional decimal acuity grades, either larger or smaller than those listed in Table 1, is permitted.

Table 1 — Visual acuity grades, Landolt ring sizes and minimum number of presentations

Visual acuity grades (nominal values)[d]			Gap size of Landolt ring (minutes of arc)	Minimum number of presentations[d]
Decimal visual acuity[a]	LogMAR acuity	Snellen fraction for test distance 6 m		
0,05	+1,30	6/120	20,0[b]	2
0,063 (0,06)	+1,20	6/95	15,8[b]	2
0,08	+1,10	6/75	12,6[b]	2
0,10	+1,00	6/60	10,0[b]	2
0,125	+0,90	6/48	7,94[b]	3
0,16	+0,80	6/38	6,31[b]	3
0,20	+0,70	6/30	5,01[b]	3
0,25	+0,60	6/24	3,98[b]	5
0,32 (0,30)	+0,50	6/19	3,16[b]	5
0,40	+0,40	6/15	2,51[b]	5
0,50	+0,30	6/12	2,00[b]	5
0,63 (0,60)	+0,20	6/9,5	1,58[b]	5
0,80	+0,10	6/7,5	1,26[b]	5
1,00	0	6/6,0	1,00[b]	5
1,25	−0,10	6/4,8	0,794[b]	5
1,60	−0,20	6/3,8	0,631[b]	5
2,00	−0,30	6/3,0	0,501[c]	5

[a] The values in parentheses shall be used only for the purpose of identifying the acuity grade.

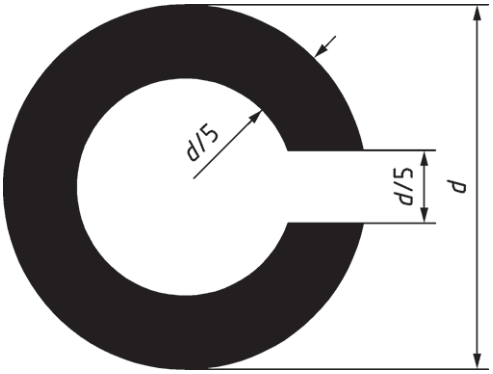
[b] The gap size is accurate to 1 %. The permissible deviation is 5 %.

[c] The permissible deviation is 10 %.

[d] The recommended number of presentations is at least 5 presentations.

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved



Key

d diameter

Figure 1 — Landolt ring

Table 2 — Spacing between standard optotypes (border to border)

Decimal visual acuity grades	Minimum spacing between standard optotypes
less than 0,06	0,4 × diameter of Landolt ring
0,06 to 0,125	1,0 × diameter of Landolt ring
0,16 to 0,32	1,5 × diameter of Landolt ring
0,40 to 1,00	2 × diameter of Landolt ring
greater than 1,00	3 × diameter of Landolt ring

4.3 Test area and spacing between standard optotypes

The field shall extend at least 0,5° in all directions from the contour of the optotypes to the border of the test field. If more than one standard optotype is used in the same test area, the spacings given in Table 2 shall apply. If more than one acuity grade is used on the test area, the spacing for the largest optotype shall apply.

Table 2 applies to both horizontal and vertical spacing.

The background to the optotypes shall appear uniformly bright and without any variation of colour or texture which could indicate the orientation of the symbols. If the different orientations are achieved by rotation of the optotypes, this rotary movement shall not be observed by the subject.

4.4 Positions of the optotype

The optotype shall be presented in at least the number of different positions per acuity grade as shown in Table 1. In 50 % of these positions, the gap shall be either vertical or horizontal but, in the case when an odd number of presentations is used, this value shall be rounded to the next larger integer. The sequence of presentations shall be as diversified as possible and shall be randomly ordered. If the standard optotype is presented singly, this fact shall be specifically mentioned in the test report.

4.5 Quality of presentation

The standard optotype as presented shall appear with sharply defined contours to an observer with a binocular visual acuity of at least 1,0 at an observation distance of 1/3 of the distance at which the optotypes are designed to be used.

The optotypes in a series shall not differ noticeably in contrast and contour.

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

Test types presented in instruments shall be observed with a magnification of 3× in order to verify the quality of presentation.

4.6 Luminance

The luminance in the immediate surround of the optotypes (chart background, see L_V in Figure 2) shall be within the range of 80 cd/m^2 to 320 cd/m^2, and shall apply to all methods of presentation.

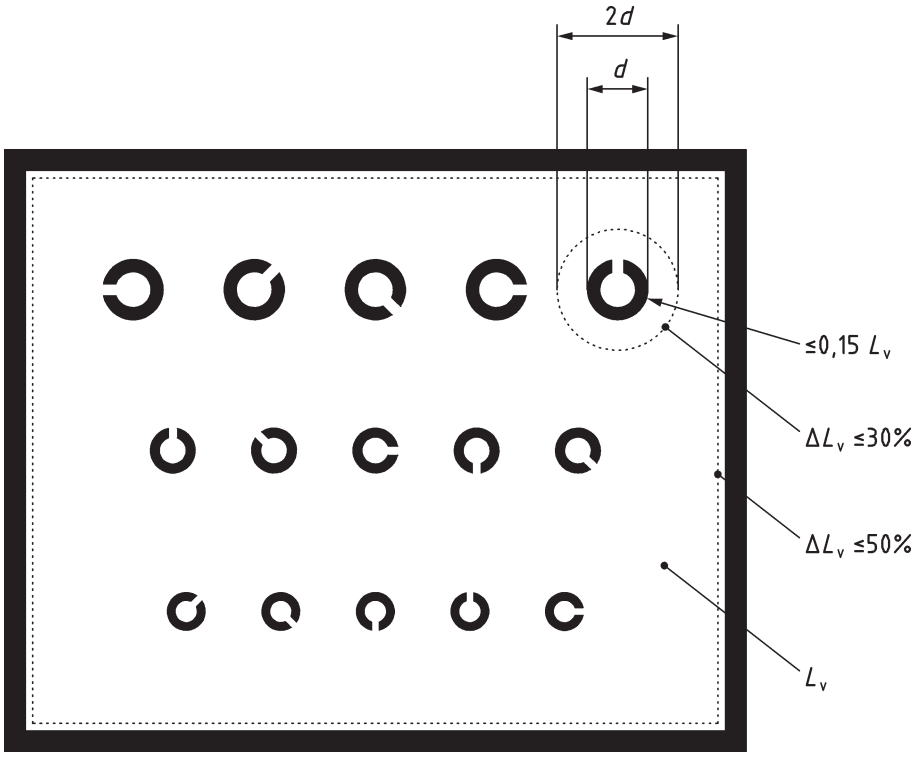
The luminance of the standard optotype shall be not more than 15 % of the surrounding field, when measured in a darkened room. All light sources and reflective surfaces in the visual field of the patient shall be not brighter than the chart from the vantage point of the test subject. In addition, no light source shall illuminate the chart in a way that alters the chart luminance or the optotype contrast from the vantage point of the test subject. There shall be no direct or indirect glare source (e.g. light source, reflected image of a light source, glossy or very bright matt surface) within the field of view.

NOTE 1 The recommended luminance is 200 cd/m^2.

NOTE 2 The luminance requirements of the optotypes and chart background are shown in Figure 2.

The luminance of the chart background extending for 0,5 *d* (where *d* = optotype diameter) beyond the optotype edge should not vary by more than ±30 % of the mean luminance of the background. The luminance meter should measure an area of diameter not greater than 0,05 *d*.

Across the entire area of the chart background, the luminance should not vary by more than ±50 %. See Figure 2.



Key

d diameter of the Landolt ring

L_V luminance of immediate surround of the optotypes

ΔL_V variability of luminance in the denoted area

Figure 2 — Specification of luminance

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

5 Test methods

5.1 Viewing distance for distance visual acuity testing

The test shall be performed with a minimum viewing distance of 4,0 m between the entrance pupil of the subject and the optotype.

5.2 Criteria for determination and assignment of visual acuity grade

When testing for visual acuity, the performance level at which the presentation of optotypes shall be terminated is dependent upon the number of optotypes used for each size.

Preferred numbers of presentation are five or 10. In each case, the minimum called correctly represents approximately 60 % of the total.

For a “Pass” assessment:

— at least three shall be called correctly if the total number of optotypes used is five, and

— at least six shall be called correctly if the total number of optotypes used is 10.

For clinical use, at least four shall be called correctly if the total number of optotypes used is six or seven, or at least five shall be called correctly if the total number of optotypes used is eight or nine;

The test shall be terminated at the first acuity grade for which the number correctly identified falls below the required number for a “Pass” assessment. The visual acuity grade shall be assigned, as one grade lower (see Table 1) than that at which the test was terminated.

6 Test report

The test report shall include the following information:

a) a reference to this document, i.e. ISO 8596:2017;

b) the identification of the acuity grades of the optotypes used in the test (see Table 1);

c) the instrument used, if any;

d) the number of different positions for each acuity grade (see 4.4);

e) the viewing distance used (see 5.1);

f) the assigned visual acuity grade (see 5.2);

g) the date and location site of the test;

h) name and address of examiner.

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

Annex A
(informative)

Optotypes for clinical investigations

A.1 General

There are various frequently used clinical optotypes. This annex provides information on these optotypes and how to apply them in clinical use.

NOTE Measurements with other optotype than the standard optotype can result in different visual acuity values. ISO/TR 19498 gives a guideline on how to compare and, if applicable, how to adapt clinical optotypes to the Landolt ring.

A.2 Types of optotypes for clinical use

Clinical optotype charts can be distinguished by

a) the method of presentation, e.g. optically projected charts, electronically generated charts or printed optotype charts,

b) the optotypes used, e.g. letters, numbers, 4-position Landolt ring,

c) Snellen-E, or symbols for children, and

d) the spacing of optotypes and lines.

Two examples of the characteristic features are as follows.

Optically projected charts or electronically generated charts normally present only very few clinical optotypes at a time. The spacing of the individual optotypes is large and often does comply to Table 2 of this document. The large letter spacing aims at avoiding a contour interaction effect between adjacent optotypes due to the crowding phenomenon.

Bailey-Lovie-charts and ETDRS-charts present a large number of optotype lines at the same time. Each line contains five letters. The inter-letter spacing is equal to the letter width and the inter-row spacing is equal to the letter height of the lower row, resulting in the characteristic wedge-shaped appearance. Due to the construction principle, the letter spacing does not comply to Table 2. Visual acuity measured with these charts is smaller than for Landolt ring charts constructed according to Table 2 especially for high acuity grades due to the crowding effect and the small letter separation. An advantage of the wedge-shaped construction is the “self-similarity” of the chart. The charts can be used in different distances without changing the effect of the contour interaction.

A.3 Size of optotypes

Each size of a set of optotypes is specified in terms of the size of some critical dimension common to that set of optotypes, e.g. for the Landolt ring, the critical detail is the gap size.

If letters or figures are used for visual acuity measurement, then it should be acknowledged that these normally show large differences in legibility, even if the size and width of stroke are identical. The impact of this variability can be reduced by choosing a subset letters or figures that are better comparable to one another. Comparability can be established for each letter or figure by showing that its effective resolution is equivalent to that of the standard optotype in a direct comparative test.

NOTE See ISO/TR 19498 for description of a method for the correlation of optotypes.

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

It is acceptable to use the four position Landolt ring (with gap up or down vertically or left or right horizontally) for clinical measurements.

A.4 Logarithmic progression of optotype sizes

If logarithmic progression of optotype sizes is used, the progression is developed in steps of $1:(10)^{0,1}$, equal to 1:1,258 9. Table A.1 lists the resulting optotype sizes together with the corresponding visual acuity notations. In these acuity sequences, numbers have been rounded. Charts are prepared so that the 20/20 row (6/6 or 1,0) is precisely specified. The other sizes are prepared to comply with the exact size progression, but the labelled size may be rounded off as in Table 1.

Table A.1 — Progression of acuity grades, in terms of gap size of the equivalent Landolt ring

Decimal visual acuity	LogMAR acuity	Snellen fraction for test distance				Gap size of Landolt ring (minutes of arc)
		6 m	5 m	4 m	6,1 m (20 ft)	
0,050	+1,3	6/120	5/100	4/80	20/400	20,0[a]
0,063 (0,06)	+1,2	6/95	5/80	4/63	20/320	15,8[a]
0,08	+1,1	6/75	5/63	4/50	20/250	12,6[a]
0,10	+1,0	6/60	5/50	4/40	20/200	10,0[a]
0,125	+0,9	6/48	5/40	4/32	20/160	7,94[a]
0,16	+0,8	6/38	5/32	4/25	20/125	6,31[a]
0,20	+0,7	6/30	5/25	4/20	20/100	5,01[a]
0,25	+0,6	6/24	5/20	4/16	20/80	3,98[a]
0,32 (0,30)	+0,5	6/19	5/16	4/12,5	20/63	3,16[a]
0,40	+0,4	6/15	5/12,5	4/10	20/50	2,51[a]
0,50	+0,3	6/12	5/10	4/8,0	20/40	2,00[a]
0,63 (0,60)	+0,2	6/9,5	5/8,0	4/6,3	20/32	1,58[a]
0,80	+0,1	6/7,5	5/6,3	4/5,0	20/25	1,26[a]
1,00	+0,0	6/6,0	5/5,0	4/4,0	20/20	1,00[a]
1,25	−0,1	6/4,8	5/4,0	4/3,2	20/16	0,794[a]
1,60	−0,2	6/3,8	5/3,2	4/2,5	20/12,5	0,631[a]
2,00	−0,3	6/3,0	5/2,5	4/2,0	20/10,0	0,501[b]

[a] The permissible deviation is 5 %.

[b] The permissible deviation is 10 %.

A.5 Criteria for determination and assessment of visual acuity using ETDRS or Bailey Lovie Charts

The following alternative method for determining visual acuity grade can be used with charts for which optotypes within the display are equally legible and for which there are five optotypes per line.

— The presentation of optotypes shall be terminated only when none of the optotypes on a line are called correctly.

— Each optotype shall be assigned a LogMAR value of 0,02.

— The sum of the values of all correctly called optotypes shall be calculated and subtracted from the LogMAR value of the top line of the chart. The resulting LogMAR value indicates the assigned visual acuity for the test.

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

A.6 Presentation of clinical optotypes

The presentation of at least five optotypes per optotype grade is recommended. The minimum number may be presented all in one line, or in succession, or on multiple lines.

A.7 Luminance of background

Regarding to the luminance of background, 4.6 applies.

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

Bibliography

[1] ISO/TR 19498, *Ophthalmic optics and instruments — Correlation of optotypes*

[2] International Council of Ophthalmology — Visual Functions Committee. Visual Acuity Measurement Standard. Ital. J. Ophthalmol. 1988, **II** (l) pp. 5–19

This is a free 26 page sample. Access the full version online.

© ISO 2017 – All rights reserved

This is a free 26 page sample. Access the full version online.

This is a free 26 page sample. Access the full version online.

ICS 11.040.70

Price based on 10 pages

© ISO 2017 – All rights reserved

This is a free 26 page sample. Access the full version online.

This page is intentionally left blank

This is a free 26 page sample. Access the full version online.

National Standards Authority of Ireland

NSAI is the state standardization body set up under the National Standards Authority of Ireland Act 1996 to publish Irish Standards.

Revisions

Irish Standards are updated by amendment or revisions from time to time. Users of Irish Standards should make sure that they possess the latest versions.

NSAI's **Tailored updating service** is designed to meet your precise needs and is therefore the most efficient and cost-effective way of keeping ahead. For more details on the tailored updating service see:

Standards.ie
Tel.: +353 1 857 6730/1

Buying standards

NSAI and International publications can be accessed:

- at standards.ie
- by tel: +353 1 857 6730/1 or
- email: info@standards.ie.

Feedback on Standards

NSAI welcomes any comments on standards whether proposing an amendment, correcting an error or identifying an ambiguity. Please use the "About NSAI" and then "Contact us" buttons on the **NSAI.ie** home page to explain your comment.

Participation in developing Standards

NSAI Standards, whether of National, European or International origin, are drawn up by panels of experts. Persons with expert knowledge in any field where standardization work is taking place and who are interested in contributing to the work of the panels are welcome to make themselves known to NSAI. Please note that conditions apply. Click on the "Get involved in Standards Development" button in **NSAI.ie**

SAI GLOBAL

This is a free preview. Purchase the entire publication at the link below:

I.S. EN ISO 8596:2018 - PDF

Looking for additional Standards? Visit SAI Global Infostore

Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation

Need to speak with a Customer Service Representative - Contact Us

This is a free 26 page sample. Access the full version online.