



ISO/TC 172/SC 7/WG 2  
Spectacle frames

Email of convenor: [ronald.rabbetts@virgin.net](mailto:ronald.rabbetts@virgin.net)  
Convenorship: BSI (United Kingdom)

**2018-06-12 ISO CD 8624 clean**

Document type: Other committee document

Date of document: 2018-06-15

Expected action: INFO

Background: Draft for the preparation of ISO/DIS 8624, with the changes made at and after the meeting in May 2018. This is the "clean" version - please see N260 for the track changes version.

Committee URL: <https://isotc.iso.org/livelink/livelink/open/tc172sc7wg2>

**Ophthalmic optics – Spectacle frames – Measuring system and terminology**

**Draft for the DIS stage**

© ISO 2018, 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

## Contents

Foreword .....	iv
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>3.1 Principal terms of the boxed lens system.....</b>	<b>1</b>
<b>3.2 Complementary terms of the boxed lens system .....</b>	<b>6</b>
<b>4 Measuring system.....</b>	<b>13</b>
<b>Annex A (informative) 3D measurement of spectacle frames.....</b>	<b>14</b>
<b>A.1 General.....</b>	<b>14</b>
<b>Bibliography .....</b>	<b>17</b>

## 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](http://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](http://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](http://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 fourth edition cancels and replaces the third edition (ISO 8624:2011) and its amendment (ISO 8624:2011/Amd 1:2015), which has been technically revised.

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

- the informative annex with its complementary definitions has been transferred to 3.2;
- the plane of the lens shape has been redefined and now relates to the orientation and position of the vertical centre line, in turn based on the apex of the groove in the frame and not a dummy lens;
- the definition of overall length of side for those without joints has been amended slightly, while the Figures now take account of the 3-dimensional nature of spectacle fronts where there is a significant face form angle;
- an informative annex takes the 3D aspect further.

# Ophthalmic optics – Spectacle frames – Measuring system and terminology

## 1 Scope

This document specifies a measuring system for spectacle frames and related terminology. It is applicable to spectacle frames with fronts that are intended to be symmetrical.

NOTE Minor asymmetry of only the nasal bearing surfaces has been included in this edition. Since such asymmetry does not affect the lens shapes, only the definition of bridge height is affected, having an amendment in its note 2 to entry.

## 2 Normative references

There are no normative references in this document.

## 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:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1 Principal terms of the boxed lens system

#### 3.1.1

##### **boxed lens system**

system for measurement and definitions of spectacle frames based on rectangles tangential to the lens shapes that are used for the determination of the dimensions of the spectacle front and in which the upper tangent is both common to the right and left lens shapes and regarded as being horizontal

Note 1 to entry: In the case of spectacle frames having a significant face form angle, the line touching the uppermost edges of the right and left lens shapes shall be regarded as horizontal.

Note 2 to entry: For measurement of a lens aperture, the measurements should be taken projected onto the plane formed by the upper and lower tangents to the lens shape. For frame measurements, this is taken to be the apex of the groove.

Note 3 to entry: For spectacle frames having a significant *face form angle*, the horizontal boxed lens size shall be measured in the plane of the lens shape.

Note 4 to entry: Since the tangent common to the right and left *lens shapes* is regarded as being horizontal, the lines at right angles to it, e.g. the two of the sides of the box either side of the lens shape, are called "vertical". While the frame is worn, the horizontal lines will remain horizontal if the head is held erect, but the vertical lines will frequently not be vertical but, although in a vertical plane, will have their lower ends tipped in towards the cheeks (see the as-worn pantoscopic angle in ISO 13666).

### 3.1.2

#### boxed centre

**C**

intersection of the *horizontal centreline* (3.2.1) and *vertical centreline* (3.2.2) of the rectangular box that circumscribes the *lens shape* (3.2.10)

Note 1 to entry: See Figure 1.

### 3.1.3

#### horizontal boxed lens size

#### horizontal lens size

**a**

distance between the vertical sides of the rectangle tangential to the *lens shape* (3.2.10)

Note 1 to entry: For spectacle frames having a significant *face form angle*, the *horizontal boxed lens size* shall be measured in the respective *plane of the lens shape*.

Note 2 to entry: See Figure 1.

### 3.1.4

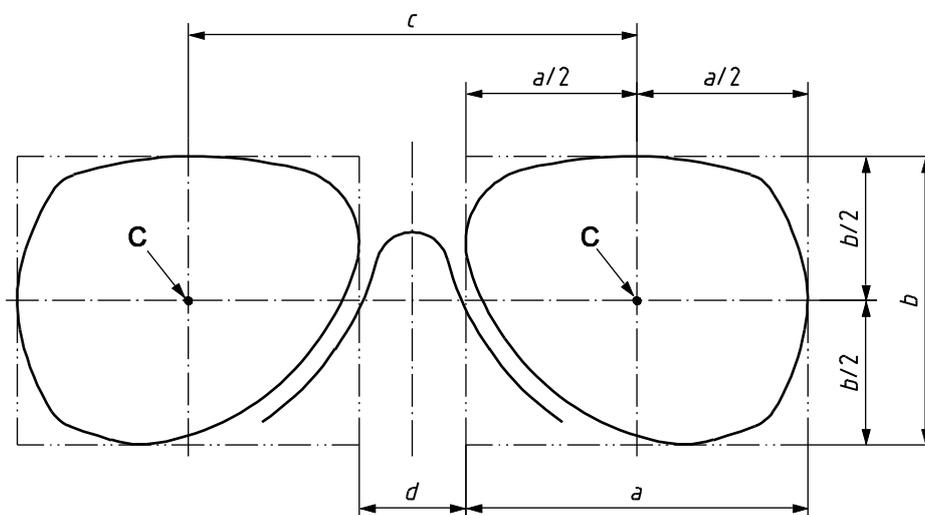
#### vertical boxed lens size

#### vertical lens size

**b**

distance between the horizontal sides of the rectangle tangential to the *lens shape* (3.2.10)

Note 1 to entry: See Figure 1.



#### Key

- C boxed centre
- a horizontal lens size
- b vertical lens size
- c boxed centre distance
- d distance between lenses

**Figure 1 — Measurements related to spectacle frames — Spectacle fronts**

**3.1.5****boxed centre distance***c*horizontal distance between the *boxed centres* (3.1.2)

Note 1 to entry: See Figure 1.

Note 2 to entry: For spectacle frames having a significant *face form angle*, the *boxed centre distance* shall be measured between the *vertical centrelines* passing through the groove of the frame aperture: see Figure 4.**3.1.6****distance between lenses***d*horizontal distance between the nasal vertical sides of the rectangles tangential to the right and left *lens shapes* (3.2.10)

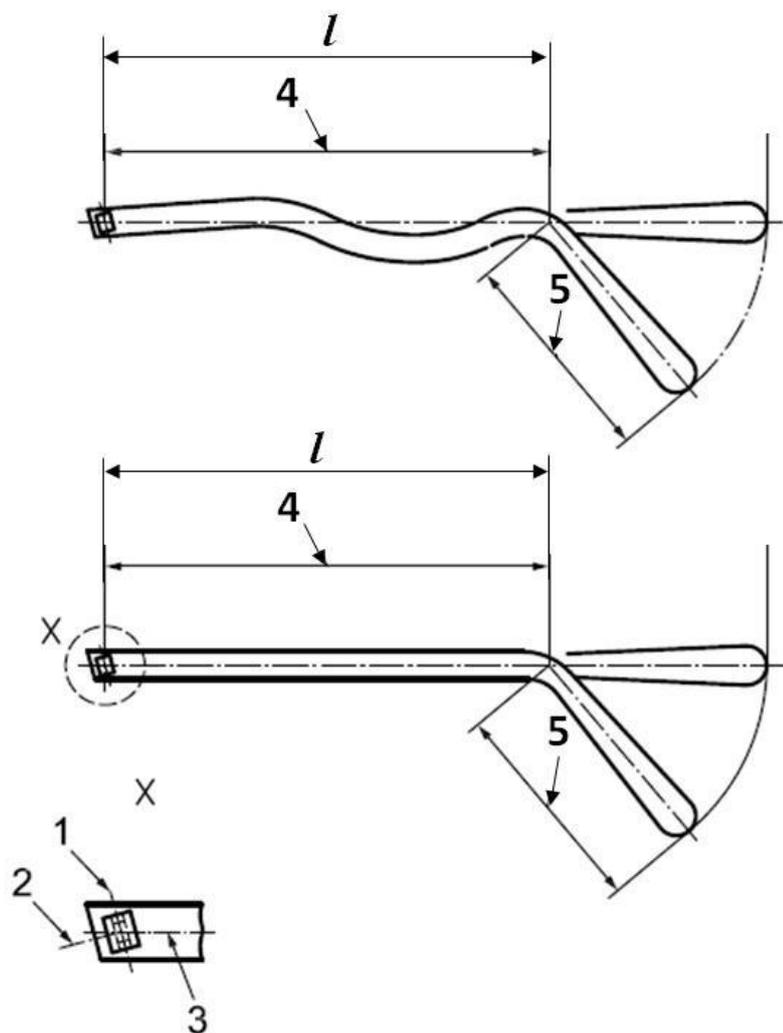
Note 1 to entry: See Figure 1.

**3.1.7****overall length of side***l*

length from the intersection of the dowel screw's axis with the median plane of the joint to the end of the side and parallel to the centreline of it, the drop having been straightened

Note 1 to entry: See Figure 2.

Note 2 to entry: For sides without a joint, the side should be held open at  $(^{90}_{-5})^{\circ}$  to the front or to that part of the side that is intended to be attached to the front, and the length measurement is from the end of the side to the back surface of the lug less 10 mm. See Figure 3.

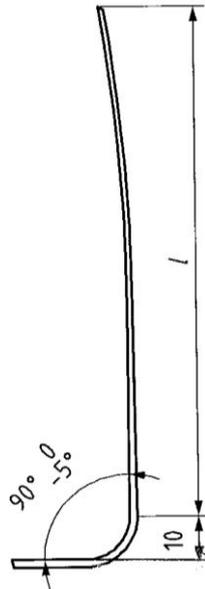


Key

- 1 axis of hinge or dowel screw axis
- 2 median plane of joint
- 3 centreline of side
- 4 length to bend (see 3.2.7)
- 5 length of drop (see 3.2.8)
- $l$  overall length of side ( $l = \text{dimensions } 4 + 5$ )

**Figure 2 — Measurements related to spectacle frames — Spectacle sides**  
 (X - detail of the measurement position at the intersection of the three lines at the joint.)

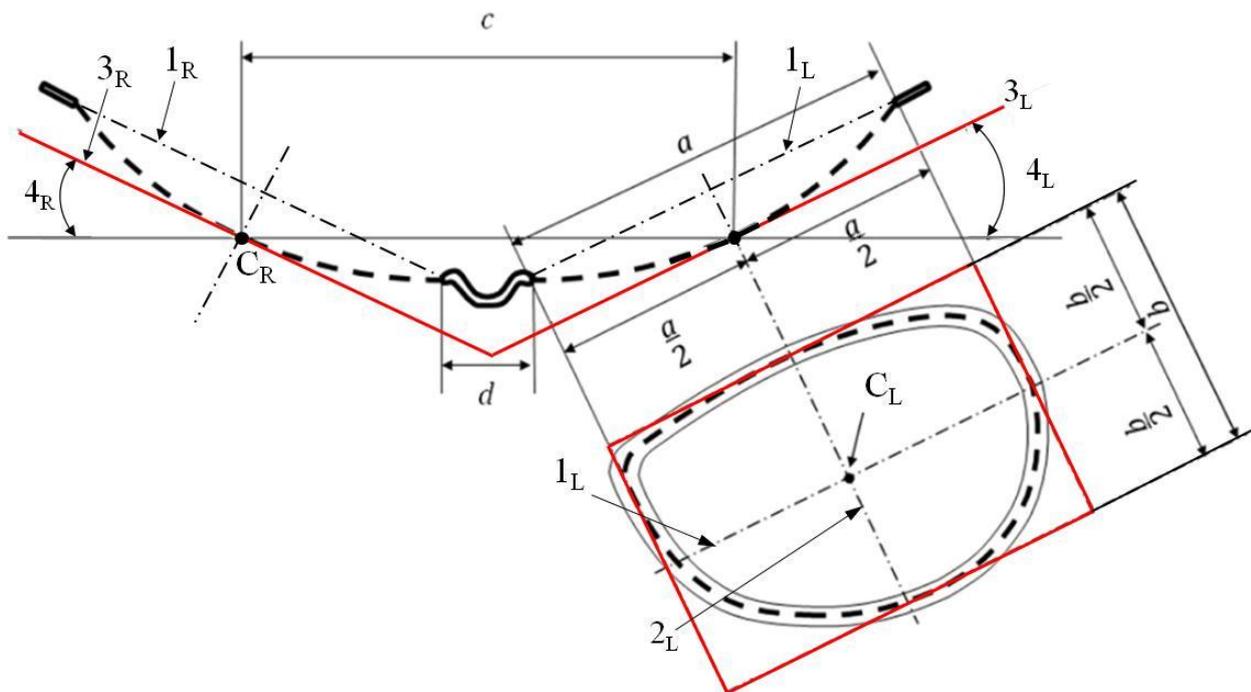
Dimension in millimetres



Key

*l* overall length of side

**Figure 3 — Measurement of overall length of side for sides without a joint**



Key

- $C_R, C_L$  boxed centre
- $a$  horizontal boxed lens size
- $b$  vertical boxed lens size
- $c$  boxed centre distance
- $d$  distance between lenses
- $1_R, 1_L$  right/left horizontal centreline
- $2_L$  left vertical centreline
- $3_R, 3_L$  right/left plane of the lens shape
- $4_R, 4_L$  right/left face form angle

**Figure 4 — Measurement of boxed centre distance in frame having significant face form angle (the bold dashed lines represent the apex of the groove in the spectacle frame)**

### 3.2 Complementary terms of the boxed lens system

#### 3.2.1

##### horizontal centreline

straight line located at an equal distance from the two horizontal tangents of the boxed lens system (3.1.1)

Note 1 to entry: The horizontal centreline is based on the apex of the groove.

Note 2 to entry: For rimless and semi-rimless frames, the centre of the edge of an afocal lens mounted in the frame is to be regarded as equivalent.

Note 3 to entry: See Figures 4, 5 and 6.



### 3.2.4

#### bridge width line

reference line for bridge measurements positioned 5 mm below the *horizontal centreline* (3.2.1)

Note 1 to entry: See Figures 5 and 6.

### 3.2.5

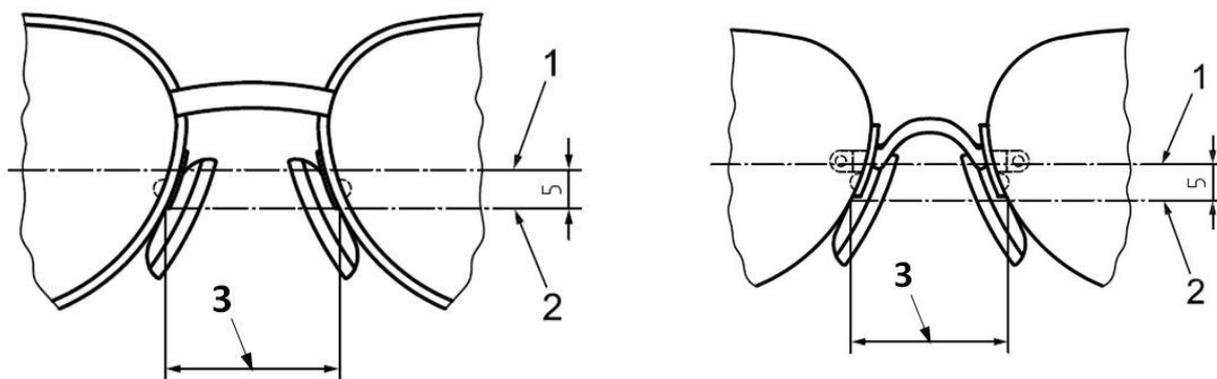
#### bridge width

minimum distance between the rims measured along the *bridge width line* (3.2.4)

Note 1 to entry: For spectacle frames with adjustable pads, *bridge width* applies to the rims, not the pads; for rimless spectacles, it applies to the minimum distance between the nasal edges of the spectacle lenses measured along the *bridge width line*.

Note 2 to entry: See Figures 5 and 6.

Dimension in millimetres.



a) Spectacle frames with metal pad bridges

b) Rimless spectacle frames

#### Key

- 1 *horizontal centreline*
- 2 *bridge width line*
- 3 *bridge width*

Figure 6 — Measurement of bridge width

### 3.2.6

#### bridge height

distance from the *bridge width line* (3.2.4) to the lower edge of the bridge, measured along the *vertical symmetry axis* (3.2.3)

Note 1 to entry: See Figure 5.

Note 2 to entry: When a frame, probably custom-made, has asymmetrical nasal bearing surfaces but not *lens shapes*, the bridge height is measured from the *bridge width line* to the highest point on the lower edge of the bridge, whether or not this point lies on the *vertical symmetry axis*.

**3.2.7****length to bend**

length from the intersection of the dowel axis with the median plane of the joint to the intersection point of the axis of the tip and side, measured along the axis of the side

Note 1 to entry: See Figure 2.

**3.2.8****length of drop**

length from the intersection point of the axes of the side and tip to the end of the side

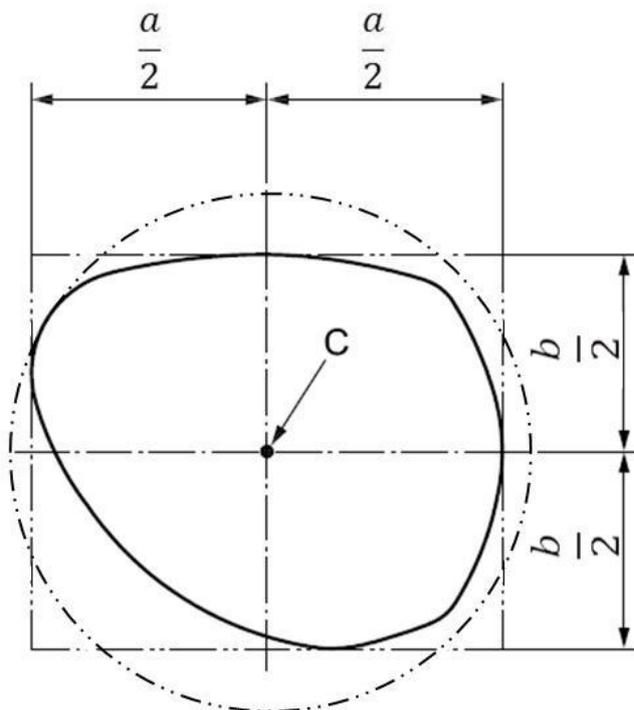
Note 1 to entry: See Figure 2.

**3.2.9****frame effective diameter**

twice the longest radius from the *boxed centre* (3.1.3) to the apex of the frame groove in millimetres

Note 1 to entry: If the frame is either semi-rimless or three-piece mount, the endpoint of the radius is taken using the lens edge.

Note 2 to entry: See Figure 7.

**Key**

C *boxed centre*

r distance from the *boxed centre* to the point on the lens edge furthest from the *boxed centre*

**Figure 7 — Circle showing the outline of an uncut lens having the effective diameter**

### 3.2.10

#### **lens shape**

outline of the lens periphery with the nasal side and the horizontal indicated

Note 1 to entry: “Lens shape” refers to the shape of hypothetical spectacle lenses that fit the frame with:

- for a spectacle lens having a bevelled edge, the outermost edge of the spectacle lens, the lens having a bevel or edge profile corresponding to the manufacturer’s design or the bevel angle or the edge profile that fits the specific groove, and a bevel width greater than the width of the groove in the front;
- for a spectacle lens having a flat or grooved edge, the outermost edge of the spectacle lens.

### 3.2.11

#### **plane of the spectacle front**

plane containing the *vertical centrelines* (3.2.2) of the right and left boxed *lens shapes* (3.2.10)

Note 1 to entry: This will be an approximation if the two centrelines are not parallel to each other.

Note 2 to entry: See Figure 8.

### 3.2.12

#### **plane of the lens shape**

plane containing the *vertical centreline* (3.2.2) that is parallel to the *horizontal centreline* (3.2.1) of the individual lens

## 3.2.13

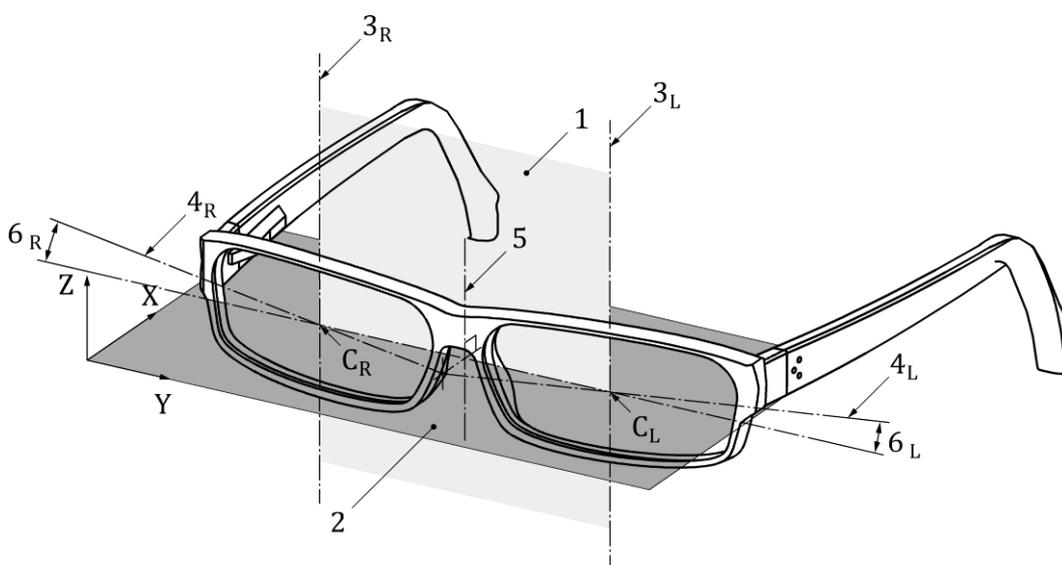
**face form angle****wrap angle**

angle between the *plane of the spectacle front* (3.2.11) and the *right plane of the lens shape* (3.2.12), or of the *left plane of the lens shape* (3.2.12)

Note 1 to entry: The right or left *face form angle* is regarded as positive if the temporal side of the *plane of the lens shape* is posterior to the nasal side.

Note 2 to entry: The *face form angles* are often measured and specified as the average of the right and left angles, but the frame can be adjusted for a specific wearer so that they differ, and the right and left angles should then be specified.

Note 3 to entry: See  $6_R$  and  $6_L$  in Figure 8.

**Key**

$C_R, C_L$	right/left boxed centre
1	plane of the spectacle front
2	XY plane, perpendicular to plane 1
$3_R, 3_L$	right/left vertical centrelines
$4_R, 4_L$	right/left horizontal centrelines
5	vertical symmetry axis
$6_R, 6_L$	face form angle, measured in plane XY (plane 2)

**Figure 8 — Face form angle — Schematic representation of the *plane of the spectacle front* and the *plane of the lens shapes***

3.2.14

**side angle**, en GB

**angle of side**, en GB

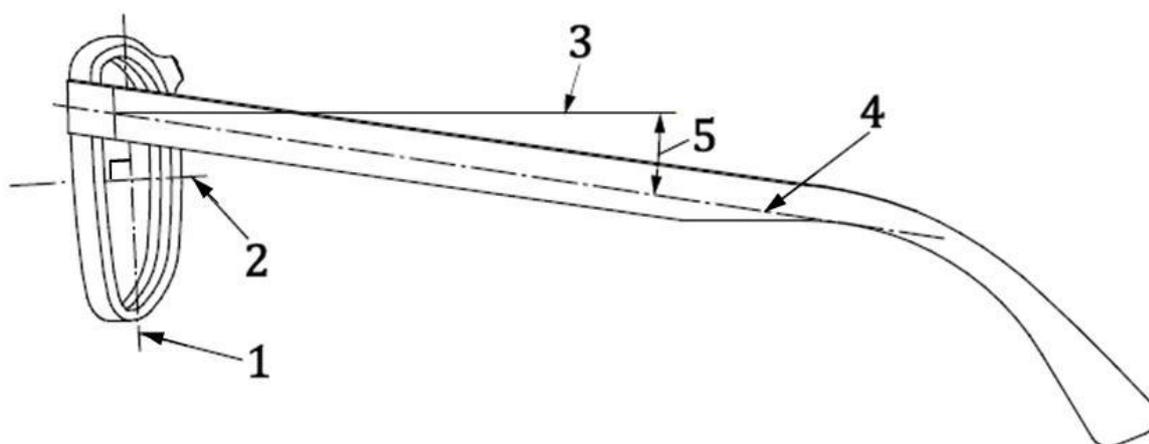
**frame pantoscopic angle**, en US

angle in the vertical plane, when the side is opened, between the perpendicular to a reference line touching the rear surface of the upper and lower rims along the vertical centreline and the line joining the middle of the joint to the point on the lower edge of the side that is assumed to make contact with the top of the ear

Note 1 to entry: When the spectacle frame is of semi-rimless or rimless construction, the reference line should be taken as the line joining the rear surface of the upper and lower edges of a plano or demonstration or dummy lens along the vertical centreline.

Note 2 to entry: Unless otherwise stated, the side angle is regarded as positive if downwards from the perpendicular to the reference line.

Note 3 to entry: See Figure 9.



**Key**

- 1 reference line touching the rear surface of the rims along the vertical centre line
- 2 perpendicular (orthogonal) to the reference line
- 3 line through the middle of the joint parallel to line 2
- 4 line joining the middle of the joint to the point on the lower edge of the side that is assumed to make contact with the top of the ear
- 5 side angle (positive in this example)

**Figure 9 — Illustration of side angle**

## 4 Measuring system

The measuring system for spectacle frames shall be in accordance with Figures 1 to 4, as defined in 3.1.

If codes are used in spectacle frame documentation, the symbols given for the terms defined in 3.1 shall be employed.

3.2 defines complementary terms relating to the boxed lens system. These are useful in the derivation of the principal terms and when dispensing spectacles but are not used when describing the size of a manufactured frame.

The measuring system comprises several horizontal and vertical dimensions and reference points. The knowledge of these is necessary for the manufacturing, ordering and adjustment of spectacle frames as well as for the exact mounting of spectacle lenses into spectacle frames.

Annex A, which is informative, discusses the implications of 3D measurement, particularly on some of the Figures in this document.

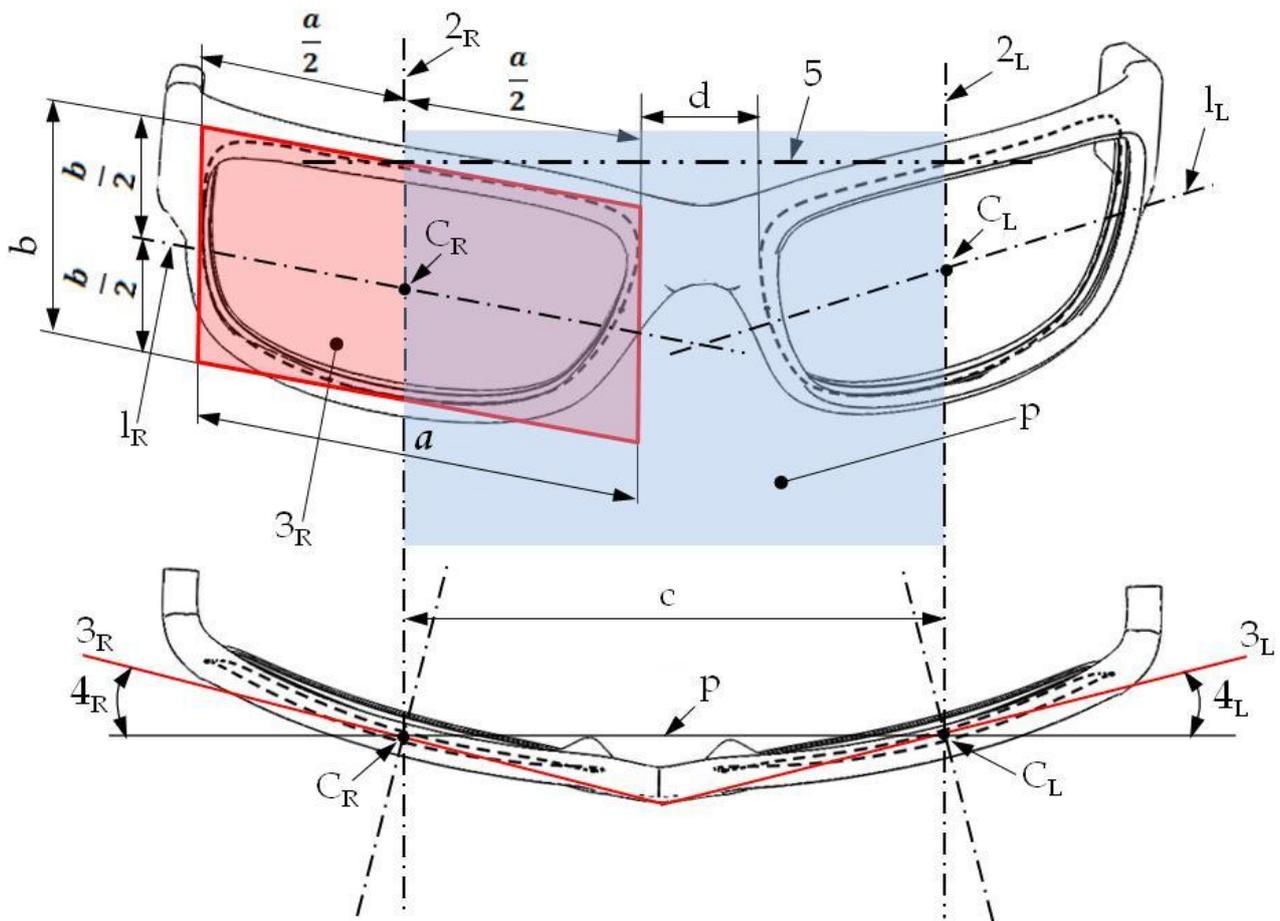
**Annex A**  
(informative)

**3D measurement of spectacle frames**

**A.1 General**

ISO 8624 was originally drafted when frames were relatively flat with zero or very small face form angles. The use of spectacle frames with significant face form angle means that measurements made in the *plane of the spectacle front*, as will be seen by an observer looking at the frame on a wearer, can differ from those measurements of lens dimensions made in the *plane of the spectacle lens*.

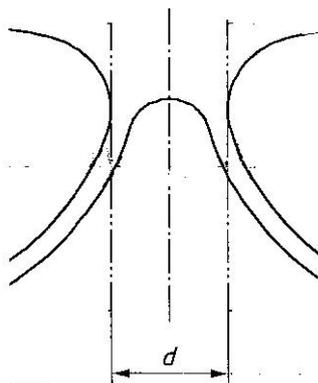
Figure A.1 gives an overall view in 3D of the spectacle front, Figures 4, A.2 and A.3 show measurement of distance between lenses and boxed lens sizes.



## Key

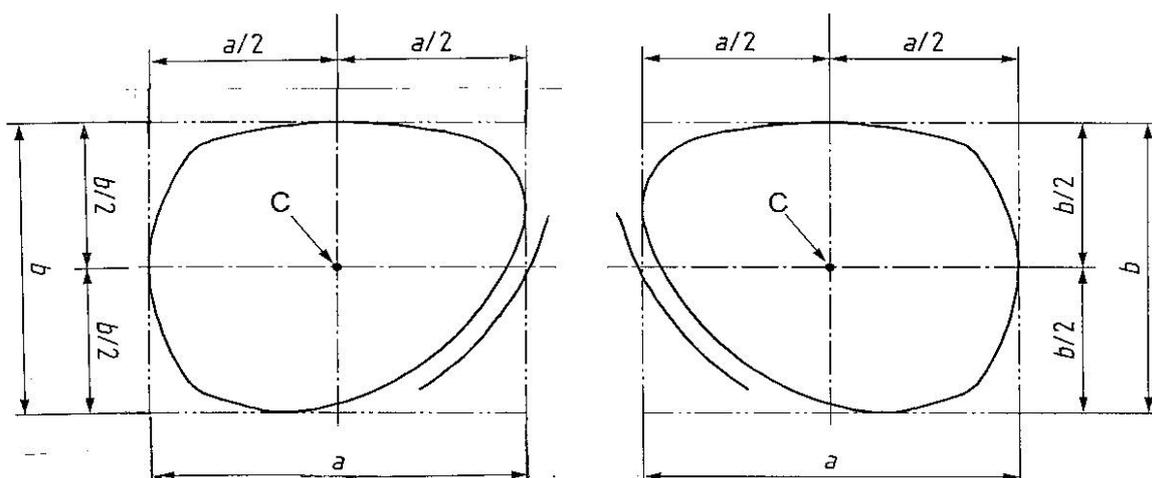
$a$	horizontal boxed lens size
$b$	vertical boxed lens size
$c$	boxed centre distance
$d$	distance between lenses
$p$	plane of the spectacle front
$C_R, C_L$	right/left boxed centre
$1_R, 1_L$	right/left horizontal centreline
$2_R, 2_L$	right/left vertical centreline
$3_R, 3_L$	right/left plane of the lens shape
$4_R, 4_L$	right/left face form angle
5	the common tangent to the upper edges of the lens shapes

**Figure A.1 — Measurements of the boxed lens size, made in the plane of the lens shape, and measurements of the distance between lenses, made in the plane of the spectacle front**



Key  
*d* distance between lenses

**Figure A.2 — Measurement of distance between lenses, in the plane of the spectacle front**



Key  
*a* horizontal boxed lens size  
*b* vertical boxed lens size  
*C* boxed centre

**Figure A.3 — Measurement of the horizontal and vertical boxed lens sizes, in the planes of the lens shape**

## Bibliography

- [1] ISO 4007, *Personal protective equipment – Eye and face protection – Vocabulary*
- [2] ISO 7998, *Ophthalmic optics – Spectacle frames – Lists of equivalent terms and vocabulary*
- [3] ISO 13666, *Ophthalmic optics – Spectacle lenses – Vocabulary*