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Ophthalmic optics — Semi-finished spectacle lens blanks —

Part 1: Specifications for single-vision and multifocal lens blanks

Optique ophtalmique — Verres de lunettes semi-finis —
Partie 1: Spécifications pour les verres unifocaux et multifocaux

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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

Page

Foreword

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 172, *Optics and photonics*, Subcommittee SC 7, *Ophthalmic optics and instruments*.

This fourth edition cancels and replaces the third edition (ISO 10322-1:2006), which has been technically revised.

ISO 10322 consists of the following parts, under the general title *Ophthalmic optics — Semi-finished spectacle lens blanks*:

— *Part 1: Specifications for single-vision and multifocal lens blanks*

— *Part 2: Specifications for progressive-power and degressive-power lens blanks*

Introduction

Compared with previous editions, this part of ISO 10322 now applies to all types of semi-finished single-vision and multifocal lens blanks.

Ophthalmic optics — Semi-finished spectacle lens blanks —

Part 1: Specifications for single-vision and multifocal lens blanks

1 Scope

This part of ISO 10322 specifies requirements for the optical and geometrical properties of all semi-finished single-vision and multifocal spectacle lens blanks.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7944, *Optics and optical instruments — Reference wavelengths*

ISO 8598-1, *Optics and optical instruments — Focimeters — Part 1: General purpose instruments*

ISO 13666, *Ophthalmic optics — Spectacle lenses — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13666 apply.

4 Classification

Semi-finished lens blanks (shortened to lens blanks in the remainder of this part of ISO 10322 for easier reading) are classified according to the finished surface as follows:

a) single-vision lens blanks;

b) multifocal lens blanks;

c) progressive-power and degressive-power lens blanks.

5 Requirements

5.1 General

The tolerances shall apply at a temperature of 23 °C ± 5 °C.

5.2 Optical requirements for the finished surface

5.2.1 General

The optical tolerances shall apply to the manufacturer's stated values at the reference points of the lens blank at one of the reference wavelengths specified in ISO 7944.

The reference point should be specified by the manufacturer. If no reference point is specified, the blank's geometric centre may be assumed to be the reference point.

The optical tolerances in Tables 1, 2 and 3 are expressed as surface power values, in dioptres, in the refractive index of the material of the lens blank being measured.

5.2.2 Tolerances on the surface power of single-vision and multifocal lens blanks

The tolerances on the surface power as specified in Table 1 shall apply at the reference point and shall be measured using the method described in 6.2.

Table 1 — Tolerances on the surface power

Values in dioptres (D)

Surface power	Tolerance on surface power[a] $\frac{F_1 + F_2}{2}$	Tolerance on surface cylindrical power[b] $\lvert F_1 - F_2 \rvert$
≥0,00 and ≤2,00	±0,09	0,06
>2,00 and ≤10,00	±0,06	0,06
>10,00 and ≤15,00	±0,09	0,06
>15,00 and ≤20,00	±0,12	0,08
>20,00	±0,25	0,08

F_1 and F_2 are the maximum and minimum values of the surface power expressed in the refractive index of the material.

[a] These tolerances apply to those lens blanks that are intended to have either no surface cylindrical power or a surface cylindrical power <0,25 D.

[b] Relative to zero, or to any intended surface cylindrical power of the lens blank's design, where this is <0,25 D.

5.2.3 Uniformity of the surface power of lens blanks with nominally spherical surfaces

Over a zone of 40 mm diameter centred around the reference point, the surface power shall not deviate by more than 0,06 D from the surface power measured at the reference point.

The uniformity shall be determined using a suitable instrument and the method described in 6.2.

5.2.4 Tolerances on the intended surface cylindrical power

The tolerances on the intended surface cylindrical power as specified in Table 2 shall apply at the reference point and shall be measured using the method described in 6.2.

Table 2 — Tolerances on the intended surface cylindrical power

Values in dioptres (D)

Intended cylindrical power	Tolerance
≥0,25 and ≤4,00	±0,06
>4,00 and ≤6,00	±0,09
>6,00	±0,12

5.2.5 Tolerances on the surface addition power for multifocal lens blanks

The tolerances on the addition power as specified in Table 3 shall apply at the reference points and shall be measured using the method described in 6.3.

Table 3 — Tolerances on the surface addition power

Values in dioptres (D)

Surface addition power	Tolerance
≤4,00	±0,12
>4,00	±0,18

5.3 Geometrical tolerances

5.3.1 Tolerances on the size

The sizes are classified as follows:

a) nominal size (d_n): dimension(s), in millimetres, indicated by the manufacturer;

b) effective size (d_e): actual dimension(s), in millimetres;

c) usable size (d_u): dimension(s), in millimetres, of the area that is optically usable;

1) effective size, d_e:

$$d_n - 1 \text{ mm} \leq d_e \leq d_n + 2 \text{ mm};$$

2) usable size, d_u:

$$d_u \geq d_n - 1 \text{ mm for } d_n \leq 65 \text{ mm};$$

$$d_u \geq d_n - 2 \text{ mm for } d_n > 65 \text{ mm}.$$

The tolerance on usable size does not apply to lens blanks for lenses with a carrier curve, such as lenticulars.

5.3.2 Tolerances on thickness

5.3.2.1 Centre thickness

The centre thickness, when measured at the geometric centre (unless otherwise stated by the manufacturer), shall be neither less than the minimum thickness stated by the manufacturer nor exceed this minimum thickness by more than 3 mm.

5.3.2.2 Edge thickness

When measured at the point stated by the manufacturer, the edge thickness shall be neither less than the minimum thickness stated by the manufacturer nor exceed this minimum thickness by more than 3 mm.

5.3.3 Segment tolerances for multifocal lens blanks

5.3.3.1 Dimensions

When using one of the methods described in 6.3, each of the segment dimensions (width, depth and intermediate depth) shall not deviate from its nominal value by more than ±0,5 mm.

If sold as a matched pair, each of the segment dimensions shall not differ between the left and right lens blanks by more than 0,7 mm.

5.3.3.2 Position

The segment position shall be measured from the distance reference point using the measurement method described in 6.4. If no reference point is specified, the blank's geometric centre may be assumed