INTERNATIONAL STANDARD

ISO 9342-2

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Optics and optical instruments — Test lenses for calibration of focimeters —

Part 2: Test lenses for focimeters used for measuring contact lenses

Optique et instruments optiques — Verres étalons pour l'étalonnage des frontofocomètres —

Partie 2: Verres étalons pour frontofocomètres pour le mesurage des lentilles de contact

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 9342-2 was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 7, *Ophthalmic optics and instruments*.

ISO 9342 consists of the following parts, under the general title *Optics and optical instruments — Test lenses for calibration of focimeters*:

— *Part 1: Test lenses for focimeters used for measuring spectacle lenses*

— *Part 2: Test lenses for focimeters used for measuring contact lenses*

Optics and optical instruments — Test lenses for calibration of focimeters —

Part 2:
Test lenses for focimeters used for measuring contact lenses

1 Scope

This part of ISO 9342 specifies requirements for test lenses for focimeters that are used to measure contact lenses. These test lenses are used to find the precise correction values that are needed to convert the power values measured to back vertex power values, as defined in Clause 3.

This part of ISO 9342 applies to focimeters meeting the requirements of ISO 8598.

2 Normative references

The following referenced documents are indispensable for the application 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 7944:1998, *Optics and optical instruments — Reference wavelengths*

ISO 8598:1996, *Optics and optical instruments — Focimeters*

3 Terms and definitions

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

3.1
back vertex power
F_{bv}
reciprocal of the paraxial value of the back vertex focal length, measured in metres

NOTE 1 The unit for expressing vertex power is the reciprocal metre (m^{-1}). The name for this unit is “dioptre”, and the symbol is D.

NOTE 2 Conventionally, the back vertex power is specified as the “power“ of a contact lens.

3.2
spherical test lenses
test lenses having spherical front and back surfaces so that their back vertex power may be expressed by a single value

3.3
reference wavelength
wavelengths specified in ISO 7944

NOTE For the purpose of this part of ISO 9342, the reference wavelength can be either the green mercury line (λ_e = 546,07 nm) or the yellow helium line (λ_d = 587,56 nm).

4 Design requirements and recommendations for test lenses

4.1 General

Test lenses should be made of homogeneous white crown glass selected to be free of bubbles and striae in an area of 4 mm radius surrounding the centre of the free aperture.

It is accepted that other materials can also be used provided their use result in lenses with a durability and optical reproducibility within the given tolerance over time and that can be manufactured to the same standard of uncertainty and form, as the glass lenses specified above.

Test lenses should have a protective mount that is designed so that, when the lens is correctly placed on the lens support, the focimeter is not obstructed.

4.2 Spherical test lens

For a complete set of spherical test lenses, the following set of nominal back vertex powers is recommended:

− 20 D, − 15 D, − 10 D, − 5 D, + 5 D, + 10 D, + 15 D, + 20 D.

Spherical test lenses should have a free aperture of at least 8 mm.

The curvature of the back surface shall approximately correspond to those of common contact lenses, which are in the range 7 mm to 9 mm, so that the spherical aberration of the test lenses approximates that exhibited by common contact lenses.

The nominal curvature of the back surface is recommended as 8 mm, a value meeting the requirement of ISO 18369-3, which is approximately equal to the front surface radius of cornea for the human eye. The radius tolerance for back surface curvature is ± 0,1 mm.

The centre thickness for a given back vertex power shall be chosen to be in the range given in Table 1.

These centre thickness value ranges are required to guarantee the durability of the test lenses during use. It is for this reason that they are generally greater than those for common contact lenses.

Table 1 — Design range for the standard test lenses

Nominal back vertex power, F_{bv} (m^{-1})	**Range for centre thickness** (mm)
− 20	0,5 to 1,5
− 15	0,5 to 1,5
− 10	0,5 to 1,5
− 5	0, 5 to 1,5
+ 5	1 to 2
+ 10	1 to 2
+ 15	1 to 2
+ 20	1 to 2