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# Ophthalmic optics – Spectacle lenses – Power and prism measurements

*Optique ophtalmique – Verres de lunettes – Mesures de puissance et de prisme*

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# Foreword

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ISO/TR 11797 was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 7, *Ophthalmic optics and instruments*.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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# Introduction

This document work undertaken by TC172/SC7/WG3 during the systematic review of ISO 21987[6] commencing in 2014. The appropriateness and relevance of the prism and power tolerances and methodologies in ISO 8980-1[1] and ISO 8980-2[2] and ISO 21987 were investigated to help determine whether these spectacle lens standards remain relevant.

Two specific power and prism task groups were established. These two groups were tasked with reviewing tolerances and test methods with respect to current industry practices, as well as conducting a systematic review of the literature. This search of the scientific literature used the keywords 'tolerances', 'prism', 'power', 'spectacle' to identify and cross-reference studies/findings in relation to the then current tolerances used in the ISO 21987, ISO 8980-1 and ISO 8980-2, and to investigate what appropriate values might be considered to satisfy spectacle lens wearer requirements. Because the results of this literature survey were inconclusive, it was decided to launch a survey into Australian laboratory practice and yields (see 5.3).

After the review of the available literature, both groups decided that a global survey of the industry into tolerances and measuring methods (see 5.4 and 5.5) would help better to understand current industry practice, thus informing a future review of ISO 8980-1 and ISO 8980-2 and ISO 21987. Its findings could assist in harmonization as to the preferred methodology for measuring power and prism when verifying uncut lenses and finished eyewear.

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# Ophthalmic optics – Spectacle lenses – Power and prism measurements

## 1 Scope

This document describes the methods currently used in applying tolerances to the focal powers of spectacle lenses and methods that can be considered for adoption in the future; it also describes methods of measuring the prism imbalance (relative prism error) between the lenses of a mounted pair. The results of a 2014 survey of manufacturing capability for lens power and a 2018 international web survey are discussed, as are possible new methods for applying tolerances to the focal power of spectacle lenses.

## 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 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.

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

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

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

## 4 Background/Technical introduction

### 4.1 General

Tolerances and methodology for lens power and prism assessment in standards have varied between countries resulting in different criteria for local country standards and international standards. This can lead to potential issues and barriers to trade as globally distributed product can be assessed and qualified against different quality criteria to that applied in the manufacturing country of origin.

During the revision of ISO 21987[6] in 2014 with the edition that was published in 2017, the appropriateness and relevance of the prism and power tolerances and methodologies was discussed. To help identify how relevant spectacle lens standards are, specific power and prism task groups were established. These two groups were tasked with reviewing tolerances and test methods in the light of current practices as well as conducting a systematic review of the literature with a view to informing future revisions.

### 4.2 Power

Historically the lens power tolerances in ISO standards and regional country standards have not been harmonized. The tolerance values allowed and the methodology of their application to measured lens powers varies internationally. There have been numerous attempts to harmonize this in the past without success.

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