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Ophthalmic optics — Review of the test methods used to assess scratch and abrasion resistance of spectacle lenses

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National foreword

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Foreword

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This document 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.

Ophthalmic optics — Review of the test methods used to assess scratch and abrasion resistance of spectacle lenses

1 Scope

This document describes the most commonly used test methods considered in standardization work relating to scratch and abrasion resistance of plastic spectacle lenses along with their technical capacities and limitations. It includes the ISO test method for assessment of claims for basic abrasion resistance in ISO 8980-5.

This document is intended to be of benefit to any future interest in ISO standardization on scratch and abrasion resistance of spectacle lenses.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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 http://www.electropedia.org/

4 Background

As the spectacle lens market shifted from glass toward plastic in the 1970s, the demand for improved abrasion resistant coatings for plastic lenses resulted in the need to assess and compare the performance of the new coatings in the market.

A number of very different abrasion test methods were developed over the years which employ a variety of ways to abrade the lens. Each method uses a unique scratch or abrasion mechanism which affects how the lens is assessed for its ability to resist damage.

In addition, different methods of assessment of test lens surface damage are used by these test methods.

Together, the different mechanisms of abrading and the different assessment methods often result in dramatically different ranking and rating of the performances of lens surfaces that do not reflect marketplace performance and the experience of wearers in real life conditions.

Considerable national and ISO standardization activity was directed to find one single test method that would reliably predict wearer experience or market performance. After much work, it was realized this goal could not be achieved and that work was abandoned.

In its place an ISO standard (ISO 8980-5) was successfully developed with a methodology capable of determining whether a lens surface claimed to be abrasion resistant could achieve a basic performance level. This test method follows the only known approach avoiding the possibility of using the standard test to rank products in the market.

Further work followed the successful publishing of ISO 8980-5, this time with the aim of creating a standard for “enhanced abrasion resistance” at a higher level than “basic level”.