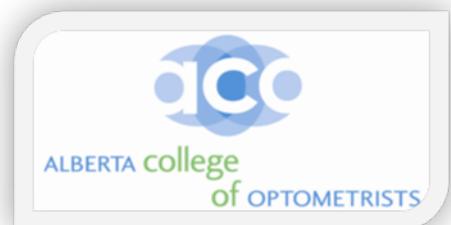




**EVIDENCE-BASED CLINICAL  
PRACTICE GUIDELINE**

# **RECOMMENDED LENS TOLERANCES**

**Effective: March 1, 2015**



# Recommended Lens Tolerances

## Clinical Practice Guideline

The objective of this Clinical Practice Guideline (CPG) is to provide guidance to Doctors of Optometry on appropriate ophthalmic lens tolerances. This guideline is based on the best available and most current ophthalmic, optometric and medical clinical evidence and research.

Minimally acceptable lens tolerances are required to ensure that patients achieve comfortable, clear and healthy vision. All dress prescription ophthalmic lenses must meet the minimum tolerances as set out in this guideline and those of ANSI Z80.1-2010. All occupational safety lenses, safety frames and sports spectacles / goggles must meet the minimum tolerances as set out in this guideline and those of ANSI Z94.3.

Over-the-counter (OTC) reading glasses and magnifiers purchased via self-selection by patients are exempt from this Clinical Practice Guideline. Verification of aberration-correcting and other similar lenses require specialized equipment (e.g. Iprofiler, etc.) and adaptation of these tolerances.

### 1. Surface Curvatures

All surface curvatures must be within  $\pm 0.50$  D of the design specifications of the lens along the principal meridians of the lens.

### 2. Refractive Powers - Sphere and Cylinder Measured at the Major Reference Point

Prescribed Power (Diopter)	Maximum Tolerance (Diopter)
0.00	$\pm 0.06$
Over 0.00 up to 6.00	$\pm 0.12$
Over 6.00 up to 12.00	$\pm 0.18$
Over 12.00	$\pm 0.25$

### 3. Cylinder Axis

Prescribed Power (Diopter)	Maximum Tolerance (Degree)
0.12 to 0.37	$\pm 3$
Over 0.37 to 1.00	$\pm 2$
Over 1.00	$\pm 1$

### 4. Lens Surface Defects

No waves, pits, scratches, watermarks, grayness, coating defects, tint irregularities, etc. may be visible to the naked eye as inspected by grazing incidence of beam of light from R40 type bulb.

## 5 Internal Lens Imperfections

No bubbles, aberrations, striae, etc. may be visible to the naked eye.

## 6. Prism Power and Optical Center Location

[a] Prism Measured at the Major Reference Point (MRP)

- Must be within 0.25 prism diopter for each lens (horizontally and/or vertically).

[b] Total Horizontal Imbalance

- Must be within 0.50 prism diopter for the prescription.

[c] Total Vertical Imbalance

- Must be within 0.25 prism diopter for the prescription.

## 7. Impact Resistance

[a] Dress Eyewear

- Glass lenses must be tempered.
- Minimum thickness = 2.0 mm  $\pm$  0.2 mm measured with a caliper at the thinnest part of the lens.
- The edge thickness must not be less than 1.0 mm at the thinnest part of the edged lens.
- The average thickness between the optical center and the thinnest edge must not be less than 1.7 mm.

[b] Safety Eyewear

- Glass lenses no longer meet the standard for safety eyewear.
- Minimum thickness = 3.0 mm  $\pm$  0.2 mm measured with a caliper at the thinnest part of the lens.

## 8. Multifocal Prescriptions

[a] Segment Power

- Within  $\pm$  0.12 D of the prescription.

[b] Segment Size

- Within  $\pm$  0.5 mm. of the prescription.
- Pair must be symmetrical on visual inspection.

[c] Segment Location

- Within  $\pm$  0.5 mm. of the prescription.

## 9. Lens Size and Shape

- The edged size of both lenses must conform within  $\pm$  0.5 mm of each other for plastic or metal frames.
- The edged shape of both lenses must match each other on inspection with the naked eye.

*NOTE: The current impact resistance standard requires all treated glass and plastic lenses to be able to withstand the impact of a 5/8 inch steel ball dropped from a height of 50 inches. The test is to be conducted at room temperature with the lens supported by a plastic tube (1 1/4 inch outside diameter, 1 inch inside diameter and a 1/8 inch neoprene gasket on the top edge of the plastic tube.*