

QUICK REFERENCE GUIDE – ANSI Z80.1-2015

1. Tolerance on Distance Refractive Power (Single Vision & Multifocal Lenses)

Sphere Meridian Power (minus cylinder convention)	Tolerance on Sphere Meridian Power (minus cylinder convention)	Cylinder ≥ 0.00 D $\leq - 2.00$ D	Cylinder $> - 2.00$ D $\leq - 4.50$ D	Cylinder $> - 4.50$ D
From - 6.50 D to + 6.50 D	± 0.13 D	± 0.13 D	± 0.15 D	$\pm 4\%$
Stronger than ± 6.50 D	$\pm 2\%$	± 0.13 D	± 0.15 D	$\pm 4\%$

2. Tolerance on Distance Refractive Power (Progressive Addition Lenses)

Sphere Meridian Power (minus cylinder convention)	Tolerance on Sphere Meridian Power (minus cylinder convention)	Cylinder ≥ 0.00 D $\leq - 2.00$ D	Cylinder $> - 2.00$ D $\leq - 3.50$ D	Cylinder $> - 3.50$ D
From - 8.00 D to + 8.00 D	± 0.16 D	± 0.16 D	± 0.18 D	$\pm 5\%$
Stronger than ± 8.00 D	$\pm 2\%$	± 0.16 D	± 0.18 D	$\pm 5\%$

3. Tolerance on the direction of cylinder axis

Nominal value of the cylinder power (D)	≤ 0.12 D	> 0.00 D ≤ 0.25 D	> 0.25 D ≤ 0.50 D	> 0.50 D ≤ 0.75 D	> 0.75 D ≤ 1.50 D	> 1.50 D
Tolerance of the axis (degrees)	Not Defined	$\pm 14^\circ$	$\pm 7^\circ$	$\pm 5^\circ$	$\pm 3^\circ$	$\pm 2^\circ$

4. Tolerance on addition power for multifocal and progressive addition lenses

Nominal value of addition power (D)	≤ 4.00 D	> 4.00 D
Nominal value of the tolerance on the addition power (D)	± 0.12 D	± 0.18 D

5. Tolerance on Prism Reference Point Location and Prismatic Power

- The prismatic power measured at the prism reference point shall not exceed 0.33Δ or the prism reference point shall not be more than 1.0 mm away from its specified position in any direction.

6. Tolerance on Prismatic Imbalance (mounted)

Single Vision And Multifocal Lenses	Vertical	Vertical	Horizontal	Horizontal
	0.00 to $\leq \pm 3.375$ D	$> \pm 3.375$ D	0.00 to $\leq \pm 2.75$ D	$> \pm 2.75$ D
Tolerance	$\leq 0.33 \Delta$	≤ 1.0 MM difference in height of PRPs	$\leq 0.67 \Delta$	$\leq \pm 2.5$ MM from specified distance interpupillary distance
Progressive Addition Lenses	Vertical	Vertical	Horizontal	Horizontal
	0.00 to $\leq \pm 3.375$ D	$> \pm 3.375$ D	0.00 to $\leq \pm 3.75$ D	$> \pm 3.75$ D
Tolerance	$\leq 0.33 \Delta$	≤ 1.0 MM difference in height of PRPs	$\leq 0.67 \Delta$	≤ 1.0 MM from specified monocular interpupillary distance

7. Base Curve Tolerance

- When specified, the base curve shall be supplied within ± 0.75 D.

8. Center Thickness Tolerance

- The center thickness shall be measured at the prism reference point of the convex surface. It shall not deviate from the nominal value by more than ± 0.3 mm.

9. Segment Size & Tilt Tolerance for Multifocals

- The segment dimensions (width, depth, and intermediate depth) shall not deviate from the nominal value by more than ± 0.5 mm. The difference between the segment dimensions (width, depth, and intermediate depth) in the mounted pair shall not exceed 0.5mm unless specified.
- The segment tilt for each lens shall be within ± 20 as measured from the 1800.

10. Segment Vertical Location, Tilt and Fitting Cross Vertical Location

- Multifocals: the segment height for each lens shall be within ± 1.0 mm. The difference between the segment height in the mounted pair shall not exceed 1.0mm.
- Progressives: the fitting cross height for each lens shall be within ± 1.0 mm. The difference between the fitting cross height in the mounted pair shall not exceed 1.0mm.
- The horizontal axis tilt for each lens shall be within ± 20 using the permanent horizontal reference markings.

11. Segment Horizontal Location and Fitting Cross Horizontal Location

- Multifocal lenses: the distance between geometric centers of the segments in the mounted pair shall be within ± 2.5 mm of the specified near interpupillary distance. The inset in both lenses shall appear symmetrical and balanced unless monocular insets are specified.
- Progressive addition lenses: the near reference point is set by the lens design. The fitting cross location in progressive lenses shall be within ± 1.0 mm of the specified monocular interpupillary distance for that lens.

12. Localized Errors

- Localized power errors or aberrations caused by waves, warpage or internal defects, which are detected by visual inspection, are permissible if no measurable or gross focimeter target element distortion or blur is found when the localized area is examined with a focimeter. Areas outside a 30-mm diameter from the distance reference point, or within 6 mm from the edge, need not be tested for local power errors or aberrations. Progressive addition lenses are exempt from this requirement.

13. Prescription Impact-resistant Dress Eyewear Lenses

- All lenses must conform to the impact resistance requirements of Title 21, Code of Federal Regulations, 801.410 (CFR 801.410).

14. Axis of polarization

- If there is a marking on the spectacle lens indication the intended direction of horizontal orientation of polarization, then the actual plan of transmittance shall be at $90 \pm 3^\circ$ from this marking.