THE VISION COUNCIL

QUICK REFERENCE GUIDE – ANSI Z80.1-2020

1. Tolerance on Distance Refractive Power (Single Vision, Multifocal and Power Variation Lenses with a single reference point)

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

2. Tolerance on Distance Refractive Power (Power Variation Lenses "Progressive Addition Lenses" with more than one reference point)

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

3. Tolerance on direction of cylinder axis

Nominal value of the cylinder power (D)	< -0.12 D	≥ -0.12 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	± 14°	± 7°	± 5°	± 3°	± 2°

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 ≤ ±3.375 D	> ±3.375 D	0.00 to ≤ ±2.75 D	> ±2.75 D
Tolerance	≤ 0.33Δ	≤ 1.0 mm difference in height of PRPs	≤ 0.67Δ	≤ ± 2.5 mm from specified distance interpupillary distance

Progressive Addition Lenses	Vertical	Vertical	Horizontal	Horizontal
	0.00 to ≤ ±3.375 D	> ±3.375 D	0.00 to ≤ ±3.375 D	> ±3.375 D
Tolerance	≤ 0.33Δ	≤ 1.0 mm difference in height of PRPs	≤ 0.67Δ	≤ 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 0.5 mm unless specified.
The segment tilt for each lens shall be within ± 2° as measured from the 180°.

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 1.0 mm.
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 1.0 mm.
The horizontal axis tilt for each lens shall be within ± 2° 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 indicating the intended direction of horizontal orientation of polarization, then the actual plane of transmittance shall be at 90 ± 3° from this marking.