

## ANSI Z80.1-2005 Optical and Mechanical Tolerances Summary

|  |                           | MEASURE   | POWER RANGE  | TOLERANCE  | COMMENTS  |  |
|--|---------------------------|---|--|--|---|--|
| General Optical Tolerances, Individual Lenses (edged or uncut) | Distance Refractive Power | Highest Meridian For SV and MFs                                 | $\geq 0.00 \text{ D}, \leq \pm 6.50 \text{ D}$<br>$> \pm 6.50 \text{ D}$   | $\pm 0.13 \text{ D}$<br>$\pm 2\%$  | 2% of meridian power  |  |
|  |                           | Highest Meridian For Progressives                               | $\geq 0.00 \text{ D}, \leq \pm 8.00 \text{ D}$<br>$> \pm 8.00 \text{ D}$   | $\pm 0.16 \text{ D}$<br>$\pm 2\%$  | 2% of meridian power  |  |
|  |                           | Cylinder Power For SV and MFs                                   | $\geq 0.00 \text{ D}, \leq 2.00 \text{ D}$<br>$> 2.00 \text{ D}, \leq 4.50 \text{ D}$<br>$> 4.50 \text{ D}$  | $\pm 0.13 \text{ D}$<br>$\pm 0.15 \text{ D}$<br>$\pm 4\%$                          | 4% of cylinder power  |  |
|  |                           | Cylinder Power For Progressives                                 | $\geq 0.00 \text{ D}, \leq 2.00 \text{ D}$<br>$> 2.00 \text{ D}, \leq 3.50 \text{ D}$<br>$> 3.50 \text{ D}$  | $\pm 0.16 \text{ D}$<br>$\pm 0.18 \text{ D}$<br>$\pm 5\%$                          | 5% of cylinder power  |  |
|  |                           | Cylinder Axis   | $> 0.00 \text{ D}, \leq 0.25 \text{ D}$<br>$> 0.25 \text{ D}, \leq 0.50 \text{ D}$<br>$> 0.50 \text{ D}, \leq 0.75 \text{ D}$<br>$> 0.75 \text{ D}, \leq 1.50 \text{ D}$<br>$> 1.50 \text{ D}$ | $\pm 14^\circ$<br>$\pm 7^\circ$<br>$\pm 5^\circ$<br>$\pm 3^\circ$<br>$\pm 2^\circ$ |   |  |
|  | Add                       | Add Power   | $\leq +4.00 \text{ D}$<br>$> +4.00 \text{ D}$  | $\pm 0.12 \text{ D}$<br>$\pm 0.18 \text{ D}$                                       |   |  |
|  | $\Delta$                  | Prism PRP Location  |  | $\leq 0.33\Delta$ at PRP<br>$\leq 1.0 \text{ mm}$ from specified PRP               |   |  |
|  |                           | Base Curve  |  | $\pm 0.75 \text{ D}$   | When specified  |  |
|  | Mounted SV & Multifocal   | $\Delta$ Imbalance  | Vertical Prism   | $\geq 0.00 \text{ D}, \leq \pm 3.37 \text{ D}$<br>$> \pm 3.37 \text{ D}$           | $\leq 0.33\Delta$<br>$\leq 1 \text{ mm}$ difference in height of PRPs                               |  |
|  |                           |   | Horizontal Prism   | $\geq 0.00 \text{ D}, \leq \pm 2.75 \text{ D}$<br>$> \pm 2.75 \text{ D}$           | $\leq 0.67\Delta$<br>PRPs $\leq \pm 2.5 \text{ mm}$ from specified distance interpupillary distance |  |
| Segment  |                           | Segment Tilt  |  | $\pm 2^\circ$  | Measured from $180^\circ$   |  |
|  |                           | Vertical Location<br>Vertical Difference<br>Horizontal Location |  | $\pm 1.0 \text{ mm}$<br>$\pm 1.0 \text{ mm}$<br>$\pm 2.5 \text{ mm}$               | Each lens<br>Between lenses<br>From specified near interpupillary distance                          |  |

|             |               |                                  |   |  |   |
|-------------|---------------|----------------------------------|---|--|---|
| Mounted PAL | Δ Imbalance   | Vertical Prism (PAL imbalance)   | $\geq 0.00 \text{ D}, \leq \pm 3.375 \text{ D}$ | $\leq 0.33\Delta$<br>$\leq 1 \text{ mm}$ difference in height of PRPs                                | Between lenses                                    |
|             |               | Horizontal Prism (PAL imbalance) | $\geq 0.00 \text{ D}, \leq \pm 3.375 \text{ D}$ | $\leq 0.67\Delta$<br>PRPs $\leq \pm 1.0 \text{ mm}$ from specified monocular interpupillary distance |   |
|             | Fitting point | Vertical Location                |   | $\pm 1.0 \text{ mm}$   | Each lens   |
|             |               | Vertical Difference              |   | $\leq 1.0 \text{ mm}$  | Between lenses                                    |
|             |               | Horizontal Location              |   | $\pm 1.0 \text{ mm}$   | From specified monocular interpupillary distance  |
|             |               | Horizontal Axis Tilt             |   | $\pm 2 \text{ degrees}$  | Using the permanent horizontal reference markings |
| Misc.       |               | Center Thickness                 |   | $\pm 0.3 \text{ mm}$   | When specified                                    |
|             |               | Segment Size                     |   | $\pm 0.5 \text{ mm}$   |   |
|             |               | Warpage                          |   | $\pm 1.00 \text{ D}$   | Cyl induced on front                              |