

NACO

National Accreditation Committee of Opticians

NATIONAL EYEGASSES EXAMINATION TOLERANCE CHART

INSPECTION ROUTINE	PROVISIONS AND TESTING PROCEDURES	TOLERANCE															
<p>Physical Quality and Appearance</p> <p>Surface Imperfections</p> <p>Internal Defects</p> <p>Localized Power Errors</p>	<p>The lens must be inspected against a black background in light from an open-shaded 40 watt incandescent clear lamp with the lens 12 inches from the light source.</p> <p>(see above)</p> <p>A high contrast grid pattern is viewed through the lens with the lens 12 inches from the eye.</p>	<p>Pits, scratches, greyness, or water marks are not acceptable. Minute hairline scratches are acceptable.</p> <p>Bubbles, striae, and inclusions are not acceptable.</p> <p>The grid must appear smoothly curved and gradually distorted. Waves found by visual inspection are acceptable if no deterioration in image quality is found when the localized area is examined with a lensmeter, focimeter, or vertometer.</p>															
<p>Refractive Power (Sphere and Cylinder)</p> <p>Untreated Glass Lenses</p> <p>Treated Glass/ Impact Resistant and Plastic Lenses</p>	<p>Power in each principle meridian is measured with a lensmeter, focimeter, or vertometer at the major reference point (MRP).</p> <p>(see above)</p>	<p>0.00 to 6.00 D: ± 0.06 D. 6.25 to 12.00 D: $\pm 1\%$. above 12.00 D: ± 0.12 D. Maximum cylinder power variation: ± 0.12 D. The difference in the refractive power error of the two lenses of a pair cannot exceed the tolerance specified for a single lens.</p> <p>0.00 to 6.00 D: ± 0.12 D. 6.25 to 12.00 D: $\pm 2\%$. above 12.00 D: ± 0.25 D. Maximum cylinder power variation: ± 0.12 D. The difference in the refractive power error of the two lenses of a pair cannot exceed the tolerance specified for a single lens. For example</p> <table border="0" data-bbox="803 1638 1258 1795"> <thead> <tr> <th colspan="2" style="text-align: center;"><u>Error</u></th> <th style="text-align: center;"><u>Difference</u></th> </tr> <tr> <th style="text-align: center;"><u>OD</u></th> <th style="text-align: center;"><u>OS</u></th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">+0.06</td> <td style="text-align: center;">-0.06</td> <td style="text-align: center;">0.12</td> </tr> <tr> <td style="text-align: center;">+0.12</td> <td style="text-align: center;">+0.06</td> <td style="text-align: center;">0.06</td> </tr> <tr> <td style="text-align: center;">-0.12</td> <td style="text-align: center;">-0.12</td> <td style="text-align: center;">0.00</td> </tr> </tbody> </table>	<u>Error</u>		<u>Difference</u>	<u>OD</u>	<u>OS</u>		+0.06	-0.06	0.12	+0.12	+0.06	0.06	-0.12	-0.12	0.00
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Refractive Power (Addition)	The power of the addition is measured with a lensmeter, focimeter, or vertometer in accordance with the instructions at the end of this chart.	±0.09 D. The curves of the reading and distance portions of a one-piece bifocal must meet sharply and be free of surface irregularities.
Cylinder Axis Untreated Glass Lenses Treated Glass Impact Resistant and Plastic Lenses	The axis is determined in relation to the cutting or mounting line and is measured with a lensmeter, focimeter, or vertometer. (see above)	0.12 to 0.37 D: ±3°. 0.50 to 1.00 D: ±2°. above 1.12 D: ±1°. 0.12 to 0.37 D: ±5°. 0.50 to 1.00 D: ±3°. above 1.12 D: ±2°.
Prism Power and Location of Specified MRP	Measured with a lensmeter, focimeter, or vertometer at the MRP. A lens specified without prism will be considered a 0Δ lens.	Vertical: ±0.25Δ per lens or a 0.25Δ imbalance. Horizontal: ±0.25Δ per lens or a 0.50Δ imbalance.
Segment Size	Measured with a ruler, at the widest part of the segment, on the segment side of the lens.	±0.5 mm. The segments must be symmetrical. Trifocal intermediate vertical dimension: ±0.25 mm.
Segment Location	Measured with a ruler, from the apex of the bevel to the highest portion of the segment, on the concave side of the lens.	±0.5 mm.
Front Base Curves	Measured with a lens clock, in the principle meridians, at the center of the lens.	±0.75 D.

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Warpage	(see Front Base Curves)	±1.00 D.
Lens Size Plastic Frames Metal Frames Rimless Mount	Measured with a ruler (see above). (see above) Measured with a ruler in accordance with the boxing system.	±0.5 mm. ±0.5 mm. Must fit into specified frame. Lens shapes must match. Edges must be straight and smooth with all sharp edges removed.
Thickness Specified Industrial Dress	Measured with a caliper at the thinnest part of the lens. Measured with a caliper at the thinnest part of the lens. Measured with a caliper.	±0.2 mm 3.0 mm Not less than 2.0 mm at the optical center (OC). Average thickness between the OC and the thinnest edge not less than 1.7 mm. Edge thickness of not less than 1.0 mm at the thinnest part of the edged lens.
<p>All treated glass/impact resistant and plastic occupational protective lenses must meet the requirements for power, size, etc. as specified in this chart and those of ANSI Z87.1-1968.</p>		
<p>Before they are mounted into frames, all treated glass/impact resistant and plastic lenses must be capable of withstanding the impact of a 5/8 inch steel ball dropped from 50 inches. This test is to be conducted at room temperature, with the lens supported by a plastic tube (1 inch inside diameter, 1-1/4 inch outside diameter) with a 1/8 inch neoprene gasket on the top edge.</p>		
<p>A generalized set of instructions for measuring the power of the addition follow:</p> <p>a) neutralize the distance portion of the lens with the temples pointing away from you (reading A)</p> <p>b) turn the eyeglasses over so that the temples are pointing towards you. Neutralize the distance portion again (reading B). If the lens is a spherocylinder lens, you must adjust the cylinder wheel. For example: The distance prescription is +4.00 +1.00 X 075. The axis is 15° from the vertical. When the eyeglasses are turned over, the axis will still be 15° from the vertical but in the opposite direction. The cylinder wheel will read 105°</p> <p>c) neutralize the near portion of the lens with the temples pointing towards you (reading C)</p> <p>d) the algebraic difference between readings C and B (C - B) equals the power of the addition</p> <p>e) because of the prismatic effect that occurs when neutralizing the near portion, the target may be blurred. Use the auxiliary prisms to shift the target to the center of the reticle</p>		