

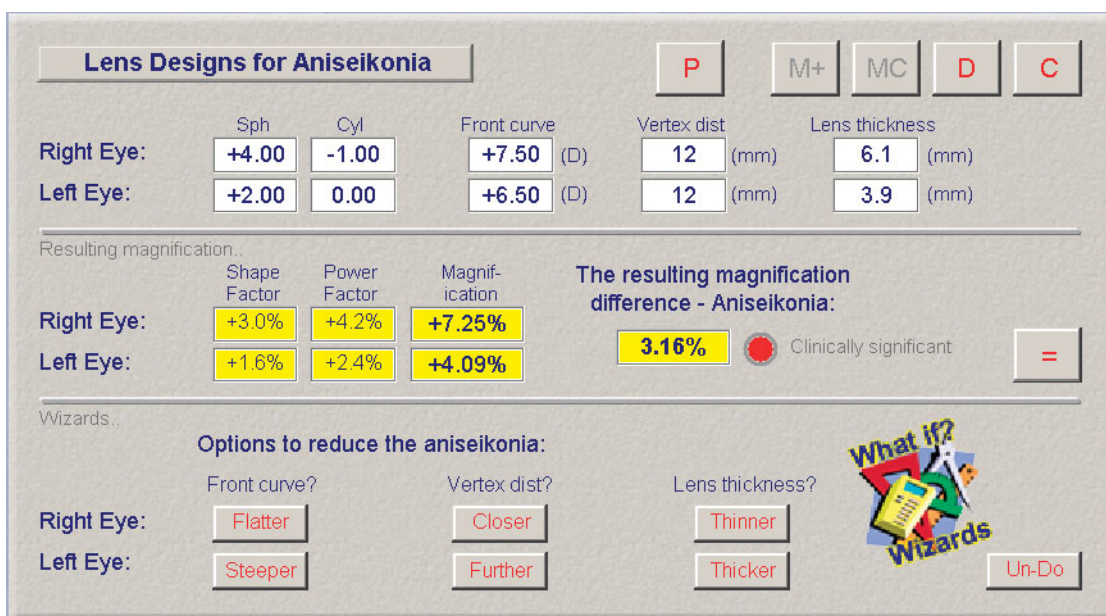
# Lens Designs for Aniseikonia

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**NOTE:** This calculator in *eye tools* is used to calculate the amount of magnification difference (*aniseikonia*) created by a significant difference in lens powers (anisometropia) and the effects of using different lens designs.

A difference of approximately +1.75D or -2.00D is the normal limit for a noticeable 2.5% difference in image size.

After making these calculations of *resulting magnification difference*, *eye tools* includes a *Wizard* that allows optometrists to easily try other lens design options for reducing the *aniseikonia*.



	Sph	Cyl	Front curve	Vertex dist	Lens thickness
Right Eye:	+4.00	-1.00	+7.50 (D)	12 (mm)	6.1 (mm)
Left Eye:	+2.00	0.00	+6.50 (D)	12 (mm)	3.9 (mm)

	Shape Factor	Power Factor	Magnification
Right Eye:	+3.0%	+4.2%	+7.25%
Left Eye:	+1.6%	+2.4%	+4.09%

The resulting magnification difference - Aniseikonia: **3.16%** ● Clinically significant

Options to reduce the aniseikonia:

	Front curve?	Vertex dist?	Lens thickness?
Right Eye:	Flatter	Closer	Thinner
Left Eye:	Steeper	Further	Thicker

Figure: The calculator for Aniseikonic Lens Designs

1. Click on **C** to clear all data.
2. Enter the *Sph* and *Cyl* powers for the *Right* and *Left* eyes.
3. Click on **D** to set the default values for the *Front Curve* and *Lens Thickness* (based on the powers entered). This also sets a default *Vertex Distance*.
4. Enter any preferred changes to these default values.
5. Click on **=** to make the calculation.

- The results are displayed as the *Magnification* in each eye and, most importantly, the *Resulting Magnification Difference* between the eyes (*Aniseikonia*).
- The highlight circle will turn RED if the *aniseikonia* is clinically significant, or GREEN when the magnification difference is acceptable.
- Using the *Wizard* feature, the optometrist can then experiment with adjusting the lens design within the limits of what is practical for the particular patient, frame and prescription. Click on the **Flatter** **Steeper** **Closer** **Further** **Thicker** and **Thinner** buttons to try different options and observe the changes caused to the results.



NOTE: The *Wizard* has buttons that are “intelligent” - they only offer options that will reduce the *aniseikonia*. For example, if the right lens needs to be steeper, the buttons will not offer the option of making it flatter.

- To print a copy of the results: Click on **P**

✓ **Tip:**

- This calculation is used when the prescription is different by more than approximately 2D between the two eyes. This difference will cause a difference in magnification that may mean the patient will be unable to use the two eyes together.

The difference in resulting magnification will also be less for frames that produce a shorter vertex distance.



EXAMPLE: In the example shown on this page, the *Resulting Magnification Difference* was 3.16%.

An optometrist might look at these results and decide that the left lens could be **Steeper** (+7.50D) - resulting in a difference of 2.90%.

Then the bevel could be moved on the right lens so that it was 0.5mm **Closer** to the eye (11.5mm) - resulting in a difference of 2.73%. (Still highlighting RED).

Finally, the left lens could be made **Thicker** (4.4mm) - resulting in a difference of 2.48%. This result is *within clinical limits* and now highlights GREEN.



Figure: The icon for an Eye Tools Wizard

	Sph	Cyl	Front curve	Vertex dist	Lens thickness
Right Eye:	+4.00	-1.00	+7.50 (D)	12 (mm)	6.1 (mm)
Left Eye:	+2.00	0.00	+6.50 (D)	12 (mm)	3.9 (mm)

Resulting magnification				The resulting magnification difference - Aniseikonia:
Shape Factor	Power Factor	Magnification		
Right Eye:	+3.0%	+4.2%	+7.25%	3.16% <span style="color:red">●</span> Clinically significant
Left Eye:	+1.6%	+2.4%	+4.09%	

Options to reduce the aniseikonia:		
Front curve?	Vertex dist?	Lens thickness?
Right Eye:	<b>Flatter</b>	<b>Closer</b>
Left Eye:	<b>Steeper</b>	<b>Further</b>

Figure: Part of the calculator for Aniseikonic Lens Designs