



Kendall Optometry Ministries, Inc



How Glasses Change Your Vision By Holland Kendall

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Kendall Optometry Ministry, Inc.

"Serving the Lord by providing better vision to
the people of underdeveloped countries"

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1.0 Introduction

The purpose of this document is to show how different kinds of eyeglasses will affect what you see. It is a good idea for you to study this document if you plan to measure eyeglasses. By understanding the concepts described in this document you will better understand how to identify the kind of eyeglasses that you are measuring.

There are 4 basic kinds of eyeglasses.

- 1) Single Vision Eyeglasses. These eyeglasses only have one area of magnification. Typically they are used just for one purpose: distance or reading but not both.
- 2) Bifocal Eyeglasses. These eyeglasses have a dual purpose in mind. They are used for both distance and reading.
- 3) Trifocal Eyeglasses. Sometimes there is a third area of magnification on the eyeglasses sandwiched between the bottom and top areas of magnification. If this is present, then the eyeglasses are called trifocals.
- 4) Progressive lens eyeglasses. Progressive lens eyeglasses have mostly replaced bifocals and trifocals. Progressive lens eyeglasses have their least power in the center for distance and progressively get more powerful as you move down to the bottom edge of the eyeglasses.

The following sections describe these 4 types of eyeglasses. Bifocals and trifocals will be described together in the same section. These eyeglasses will be pictured in front of two different types of charts (Appendices A & B) which will be used to help identify the type of eyeglasses being measured. Larger versions of these charts are available.

Keep in mind that all 4 of these types of eyeglasses can have an additional parameter called “prism”. Prism is typically used to correct a problem with double vision. When a large amount of prism is cut into used prescription eyeglasses, they will not likely be usable by another person. These type of eyeglasses should be discarded.

There are 4 numbers which describe the prescription of a pair of eyeglasses. They are: Sphere, Cylinder, Axis and Add. Here is what that prescription will look like on an eyeglasses inventory label.

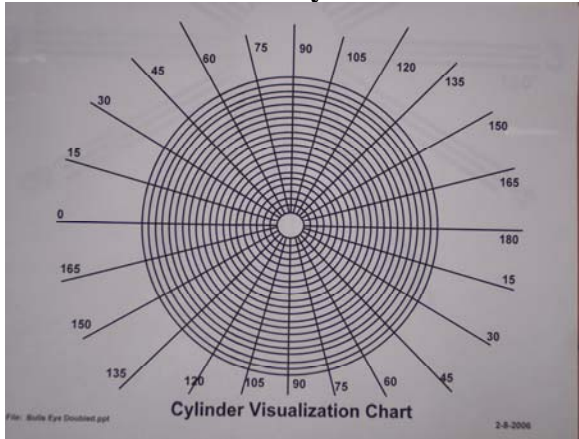


“OD” indicated the right eye prescription. “OS” indicates the left eye prescription. In this example the right eye has a +2.00 Sphere, -.25 cylinder, 12 degrees of axis and a 2.00 add. The left eye has a +2.00 sphere, -.50 cylinder, 33 degrees of axis and a 1.50 add.

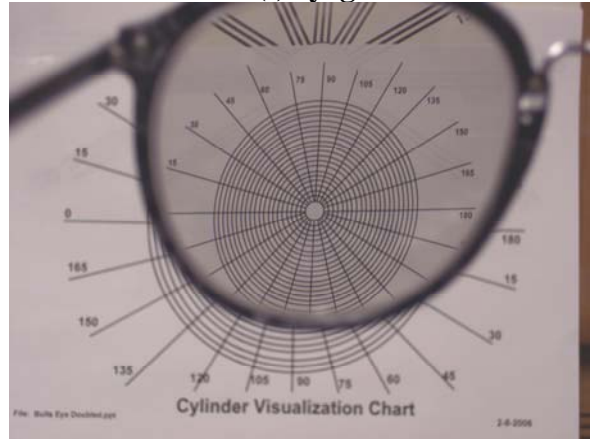
2.0 Single Vision Eyeglasses.

Single vision eyeglasses only have one area of magnification. Typically they are used just for one purpose: distance or reading but not both. Look at the 2 pictures below.

The Bulls Eye Chart.



The effect of minus (-) eyeglasses on the chart.

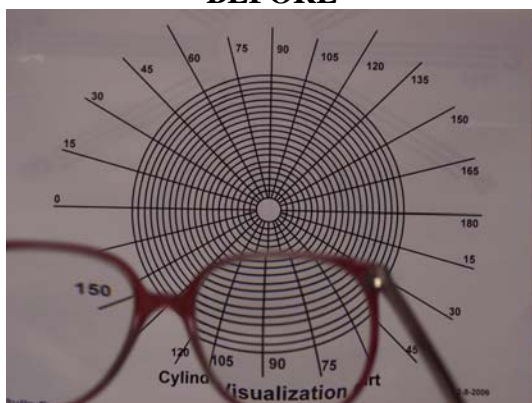


A Minus (-) pair of eyeglasses will make the bulls eye circles smaller. Conversely a Plus (+) pair of eyeglasses will make the bulls eye larger. Look at the below prescription.

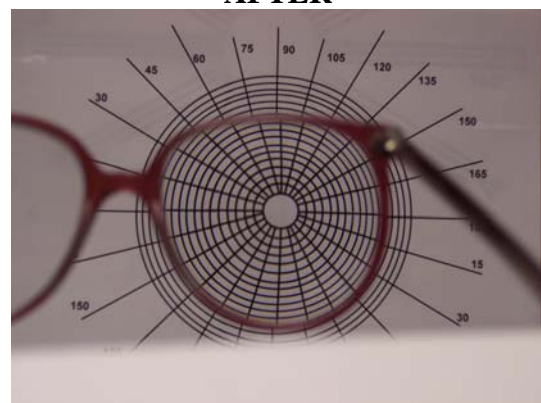


Notice how the right eye (which is plus) makes the circles in the bulls eye bigger.

BEFORE



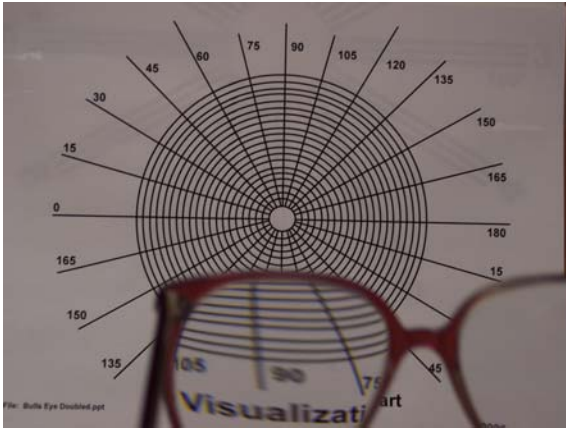
AFTER



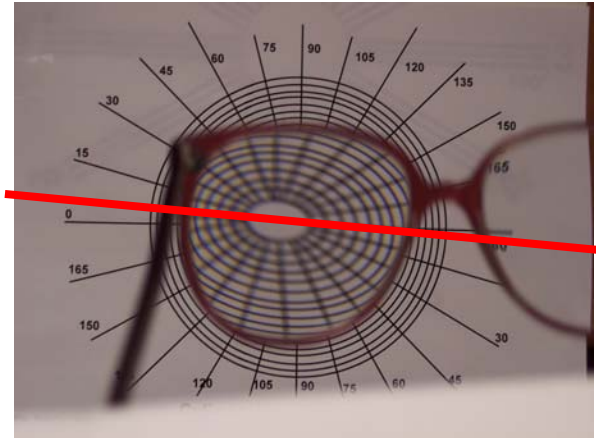
That is the affect of + sphere on things that you see. It makes them bigger.

Now look at the left eye lens when viewing the bulls eye.

BEFORE



AFTER



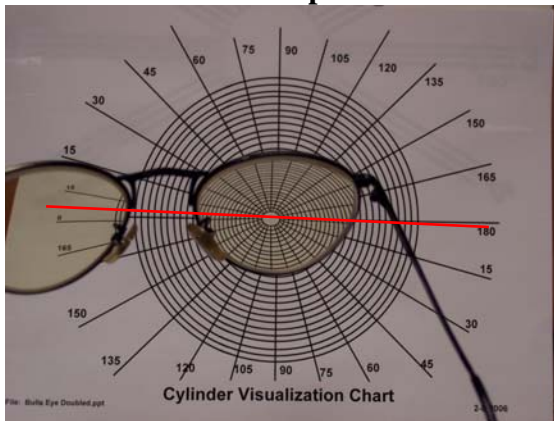
Notice two things happen with the bulls eye chart. First the circles get bigger but second, they turn into ovals. Notice the red line which has been drawn through the oval. This oval shows the angle of the axis for the pair of eyeglasses. Remember for the left eye the prescription was Sphere = 3.75, Cylinder = -1.50, and Axis = 3. This red line is very close to being on the axis marker of 3.

Another thing to notice about the left side picture above is how flattened (into an oval) has the circle become. The larger the cylinder is, the more the flattening of the circle. So, if the cylinder was -3.50 instead of the -1.50 for this example the circle would be much flatter.

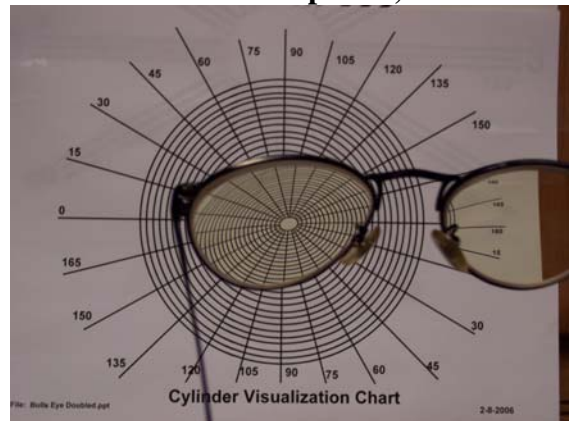
Look at this example to the right of a minus sphere. Look also how you can see the affects of cylinder and axis.



Smaller with minus sphere . Axis = 23



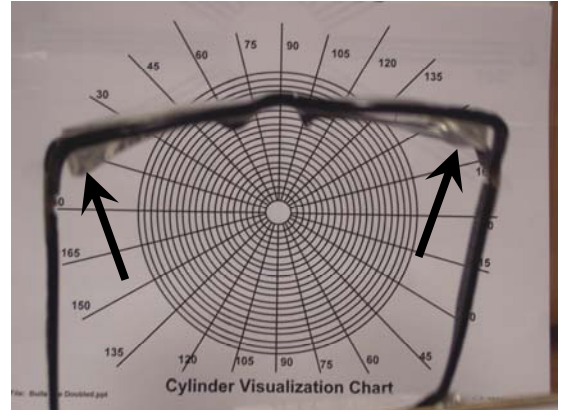
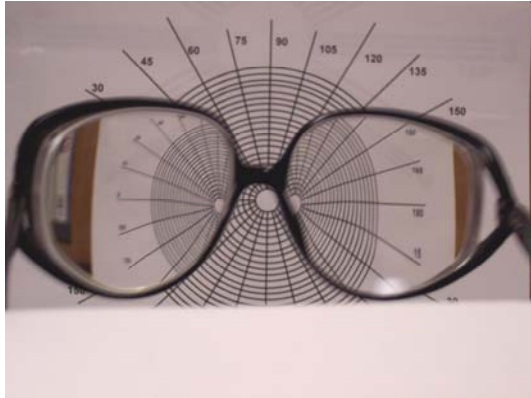
Smaller with Minus sphere , Axis = 167.



You can see an estimate of the axis and you can see the affect of the minus sphere on the chart (it makes it smaller).

3.0 Prism added.

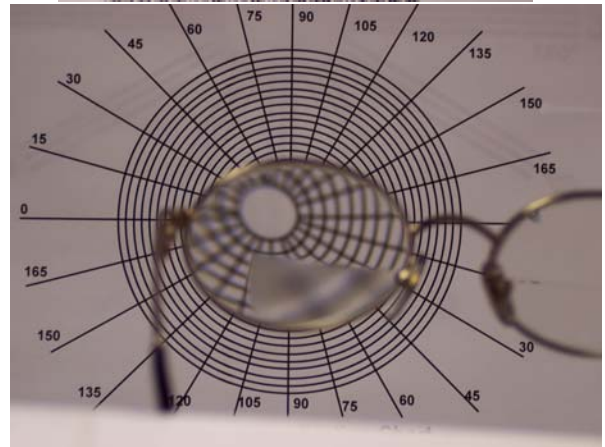
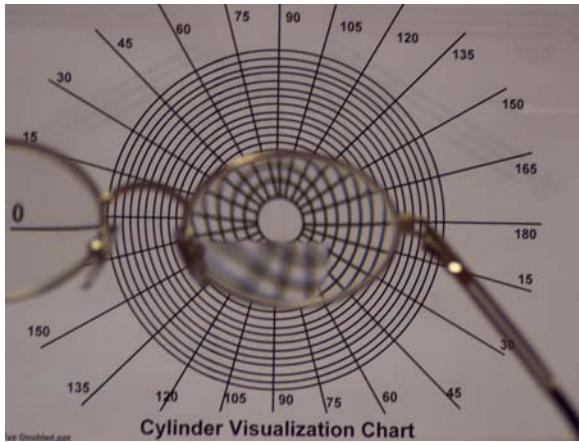
Below you can see a pair of eyeglasses which has a lot of prism.



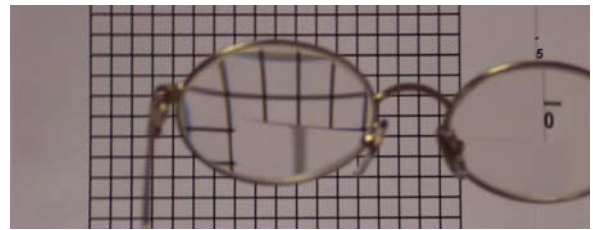
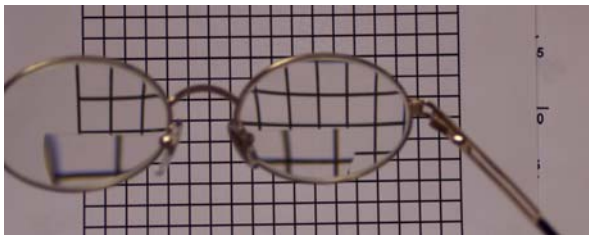
Notice how you see the center of the bulls eye three times: once through the left lens, once through the nose piece, and one through the right lens. This is the doubling affect of prism on eyeglasses. On the right picture above the arrows show where the glasses are very thick to create the prism affect. These types of eyeglasses cannot easily be used on another person and should be discarded.

4.0 BiFocal Eyeglasses

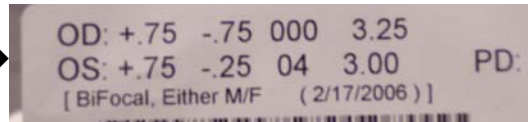
To the right is a bifocal prescription and how it affects the right and left lens.



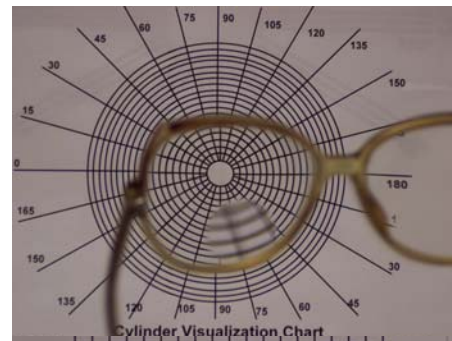
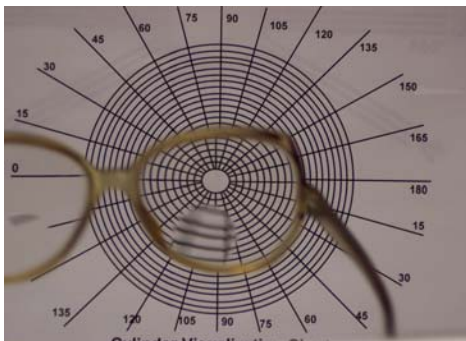
This is called a “D” segment bifocal because it is shaped somewhat like a “D”. Below is the same pair of eyeglasses when in front of the grid.



To the right is another bifocal prescription=====>



Below is the affect of this pair of eyeglasses on the two different charts.

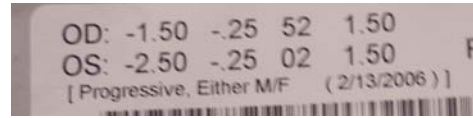


This is a different type of segment which is shaped much like a circle. It is also sometimes difficult to spot and can cause a person to measure a pair of eyeglasses as single vision even though they have a bifocal segment.

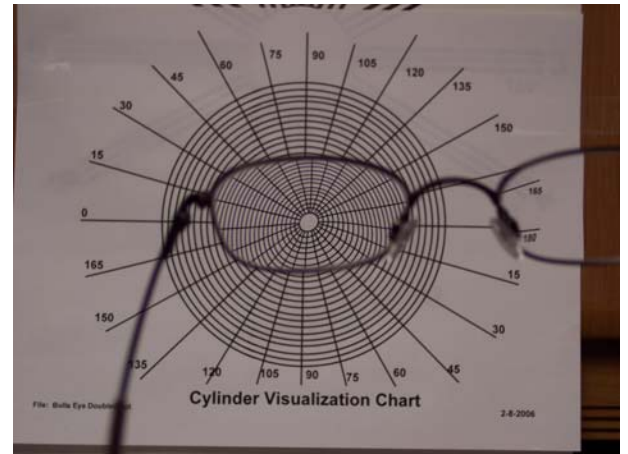
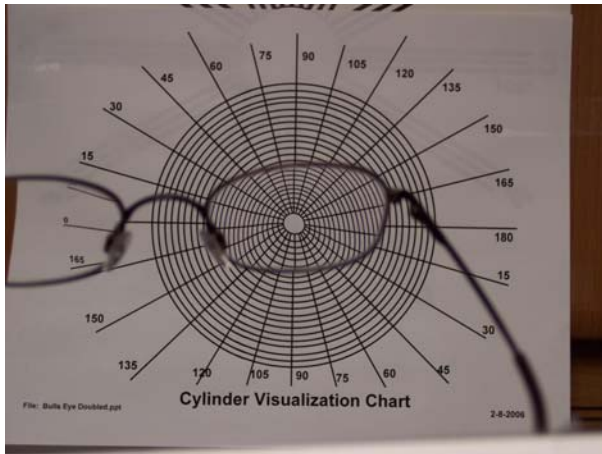
5.0 Progressive Eyeglasses

Progressive eyeglasses are frequently mistaken to be single vision eyeglasses. This is because you do not see a bifocal segment so you assume they are single vision. The following pictures should help you identify a pair of progressive eyeglasses.

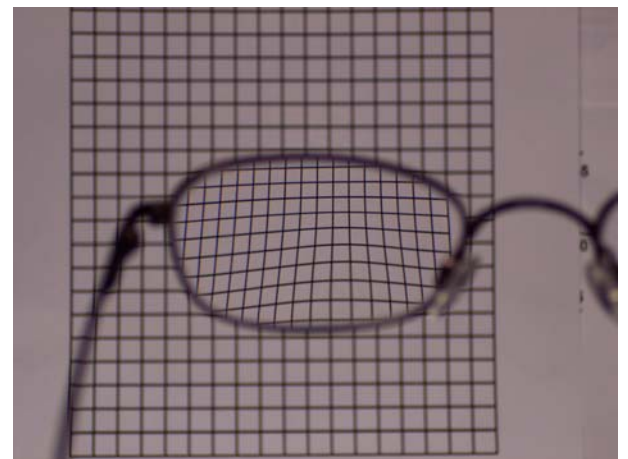
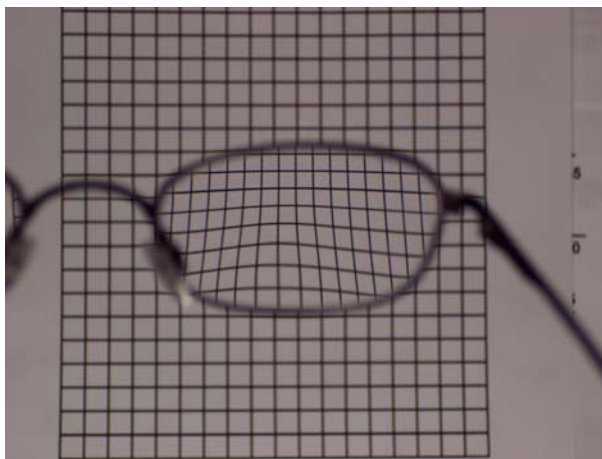
Notice the progressive prescription to the right:===>



When you look at the bulls eye, it doesn't look much different from any other pair of minus eyeglasses (circles get smaller).



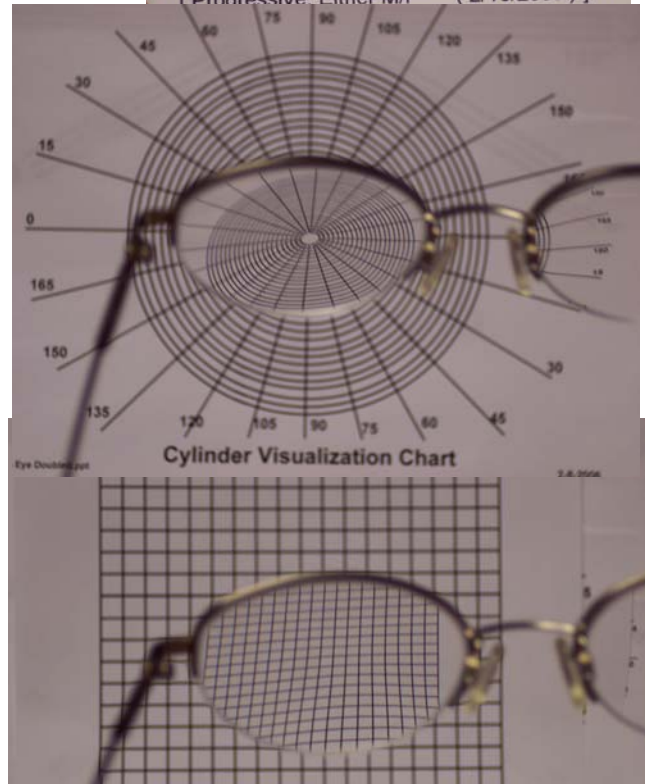
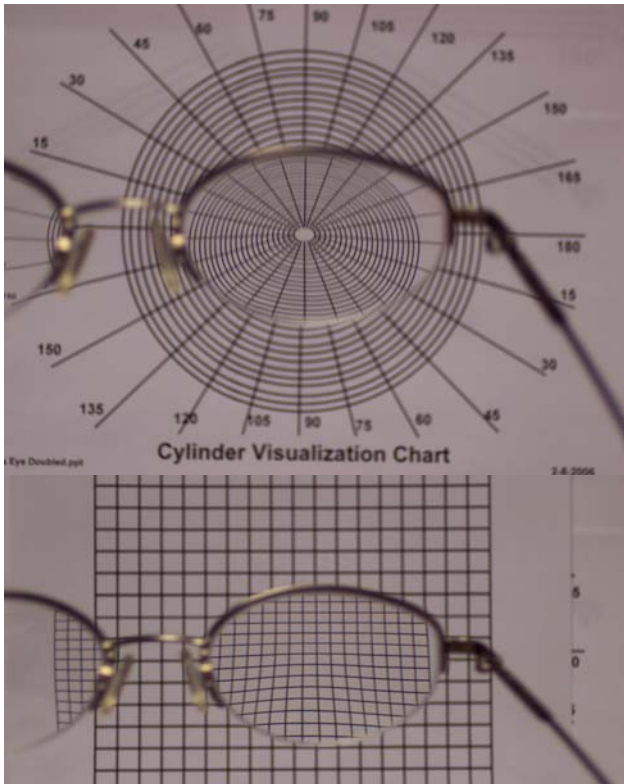
However, when you look at the grid, you can see the difference.



Notice how the lines get farther apart as you go lower on the eyeglasses. This shows the additional magnification of the progressive eyeglasses when going from top to bottom. The lines getting wider, is your best indication that you have a pair of progressive eyeglasses.

To the right is another example of progressive eyeglasses.==>

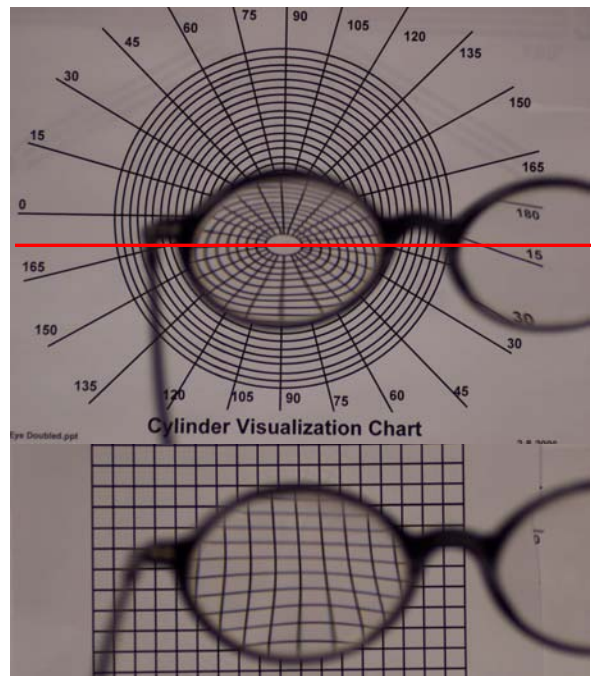
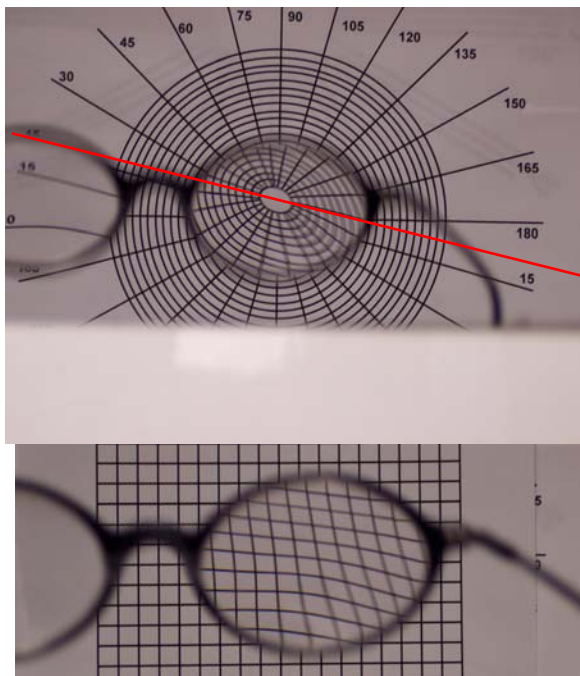
OD: -3.50 -2.50 03 1.50
OS: -4.25 -3.00 173 1.50
[Progressive, Either M/F (2/13/2006)]



Again you can see how the lines get further apart at the bottom of each lens.

To the right is a third pair of progressive lens. Note the red lines which are draw to show the axis. The high cylinder is also very visible.

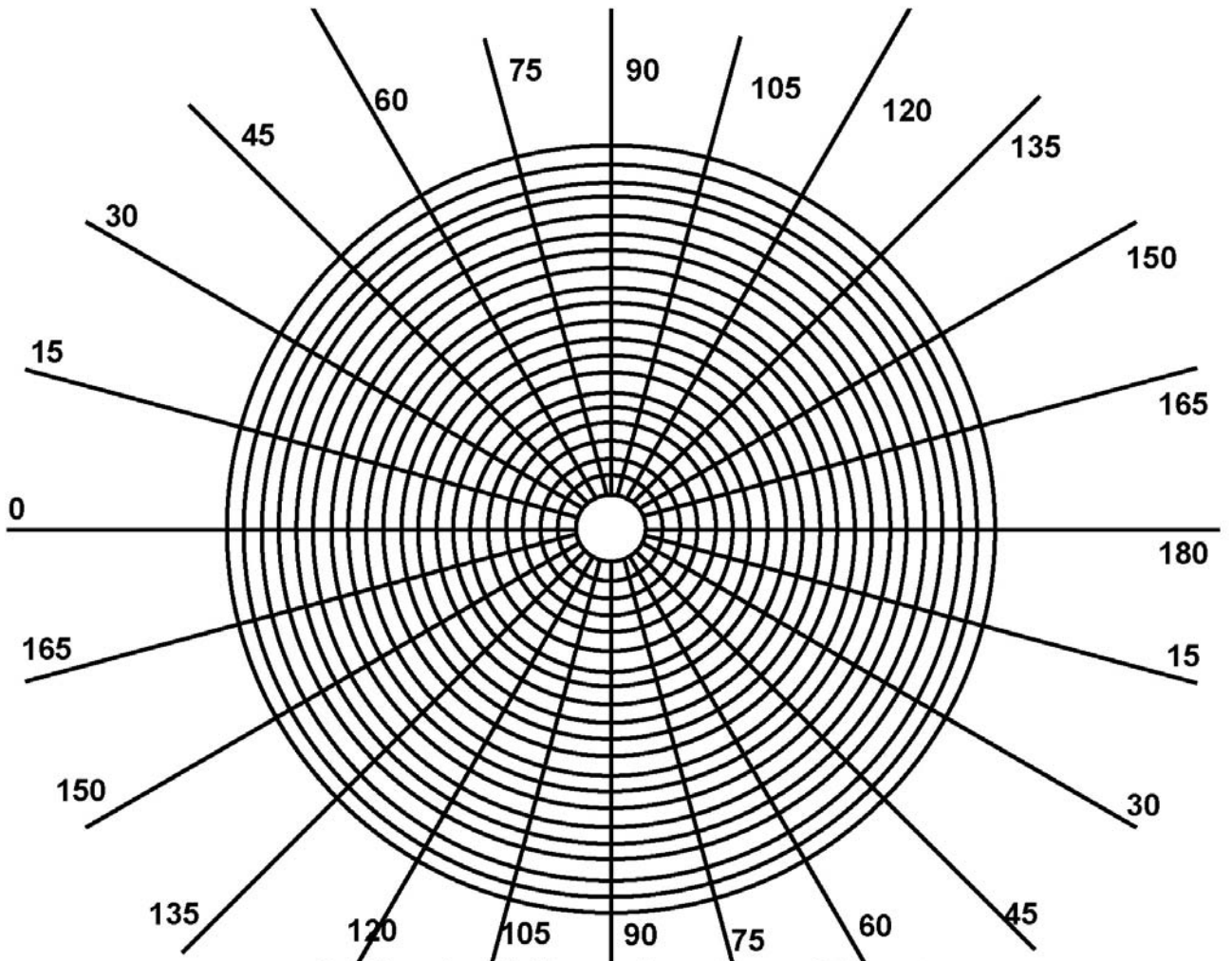
OD: +.75 -2.75 26 1.75
OS: +1.00 -3.00 04 1.25
[Progressive, Either M/F (2/13/2006)]



6.0 In Summary

Hopefully this document has helped you identify what type of eyeglasses you are measuring. It can also be very useful in the optical clinic when you pull out a pair of eyeglasses and suspect the prescription written on this pair is incorrect. Using the knowledge you gained from this document, you may be able to decide to remove this pair from inventory so it can be re-measured.

Appendix A – Bulls Eye Chart



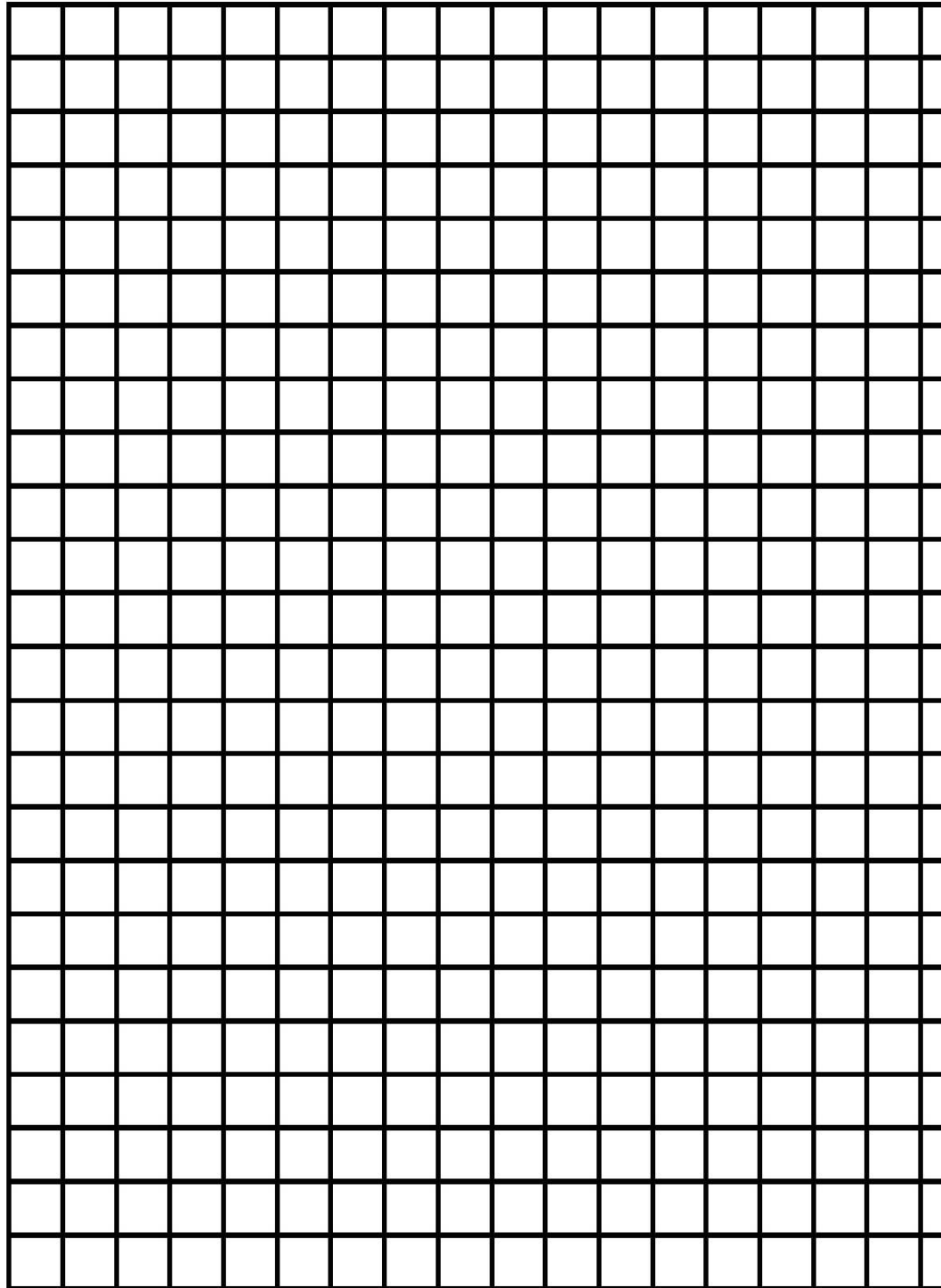
Cylinder Visualization Chart
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Bulls Eye Doubled.ppt

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A full page version of this chart is available.

Appendix B – Progressive Identification Grid.



Progressive Identification Grid.

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