CROSSBOWS optical

Digital EyeView

What is it?

Digital EyeView uses raytracing technology to ensure superior performance across the entire lens. It uses specially developed software which optimises the entire lens to correct power errors. Each lens is customised to the prescription.

Where Is It Used?

EyeView is only employed in our most advanced all purpose progressives

V+ Soft	U Soft
V+ Wide	U Wide

What Are The Benefits?

More consistent optical performance over the range of prescription powers
Wider viewing areas for patients with long sightedness
Improved distance area for patients with short sightedness
Improved image quality in principal viewing areas

How Does It Work?

A traditional analysis of a progressive design simulates light travelling in parallel lines through the lens. The light beams in this type of analysis would resemble those shown in Figure 1.

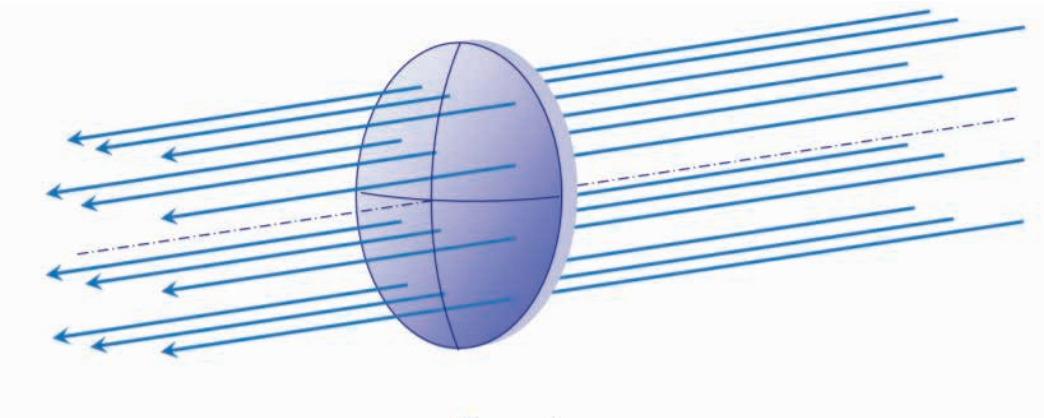

Figure 1

Using this method of analysis, the resulting analysis of a given progressive lens is shown in Figure 2.

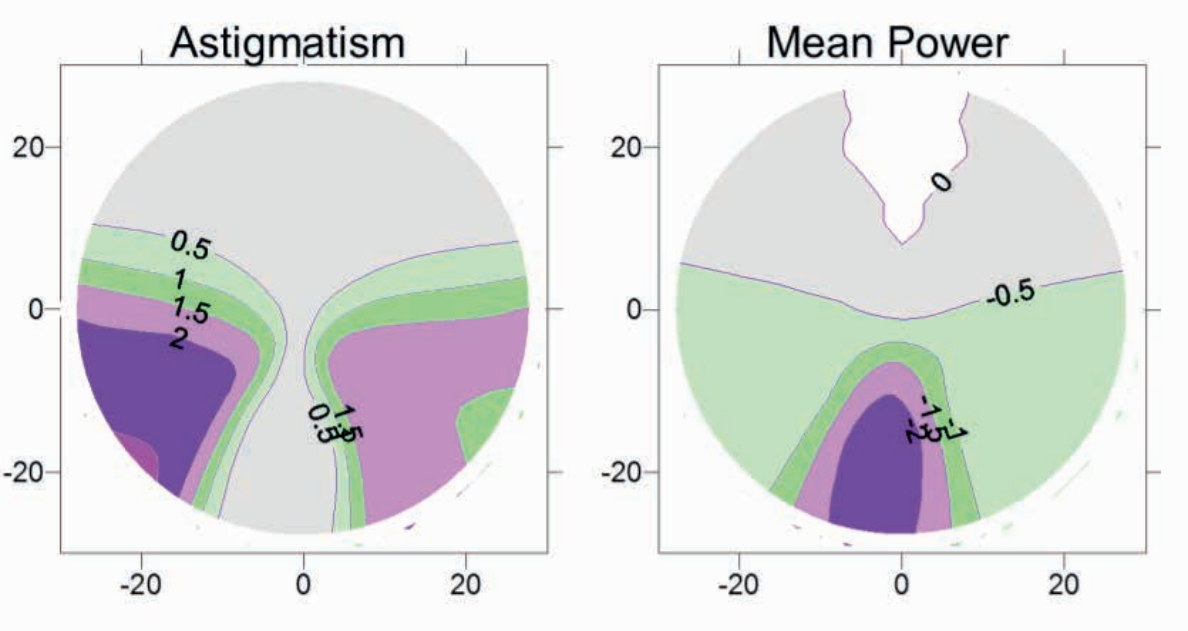

Figure 2

Figure 2 shows the astigmatism, or distortion, of the lens on the left hand plot, and also the power of the lens on the right hand plot. The astigmatism plot demonstrates that there is a wide clear distance area and a good, astigmatism free, channel leading to a generous, useable reading area that widens as the eye continually moves downwards.

This, however, is not how the eye actually looks through a lens. In practice, the lens is stationary on a person's face and the eye rotates left and right and up and down to look through the lens. The rays of light do not travel in straight, parallel, lines, but rather start at one point, i.e. the object being looked at, diverge, travel through the lens and then converge on one point, i.e. the image plane at the back of the eye.

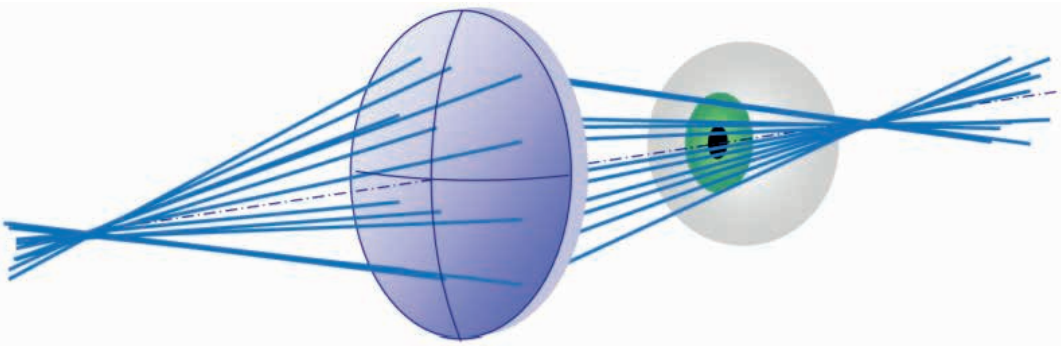

Figure 3

It can be seen on Figure 3 that light travels at different “gaze angles” to and from the images we see. If the same progressive lens is analysed using this method of ray tracing that resembles the real world conditions much more closely, then Figure 4 illustrates what the design looks like.

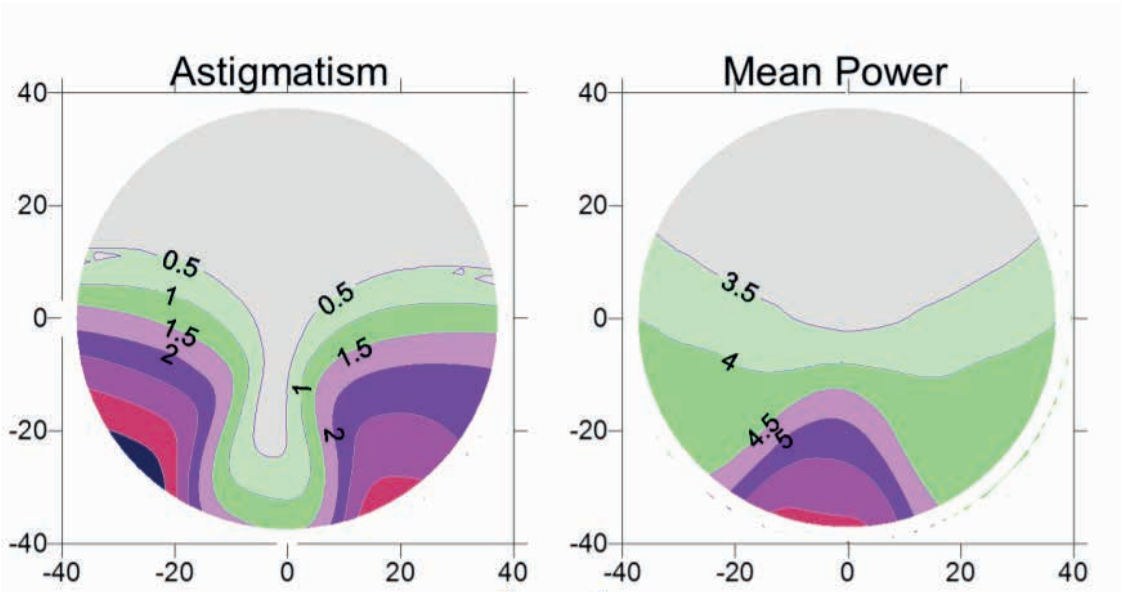

Figure 4

The differences occur because the patient is not looking straight through the lens at all times. When looking through the centre of the lens the patient will experience their correct power. However as soon as their eyes move away from the centre they will start to experience a small change in their spherical prescription and the introduction of some astigmatism caused by the gaze angle.

This astigmatism is what is referred to as oblique astigmatism, or oblique aberration. The amount of oblique astigmatism that they experience will depend on their prescription, how far away from the lens centre they are viewing (the gaze angle), and whether the lens is flat or bulbous in shape. Generally the flatter the lens the more oblique astigmatism will be experienced. This oblique astigmatism will cause the patient to see less clearly when they look in these regions.

In freeform lens manufacture, each lens is cut to an individual prescription. EyeView technology is employed during the calculation stage of creating a lens and modifies the surface geometry to virtually eliminate the oblique astigmatism whilst retaining the original design characteristics allowing all patients to enjoy almost the same optical performance regardless of their prescription.

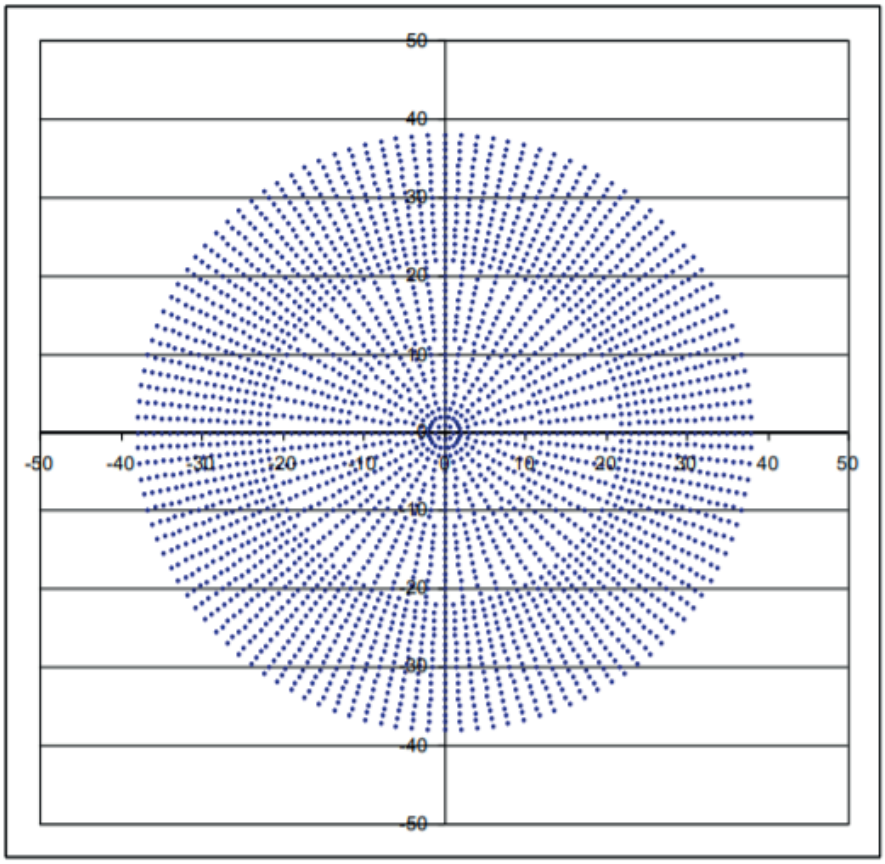

Figure 5

In order to be effective in reducing unwanted oblique astigmatism across the entire lens, EyeView technology analyses the lens at numerous points (see Figure 5). The resulting lens now looks like the lens that the designers created in the first instance, without any of the limitations placed on it by real world conditions.

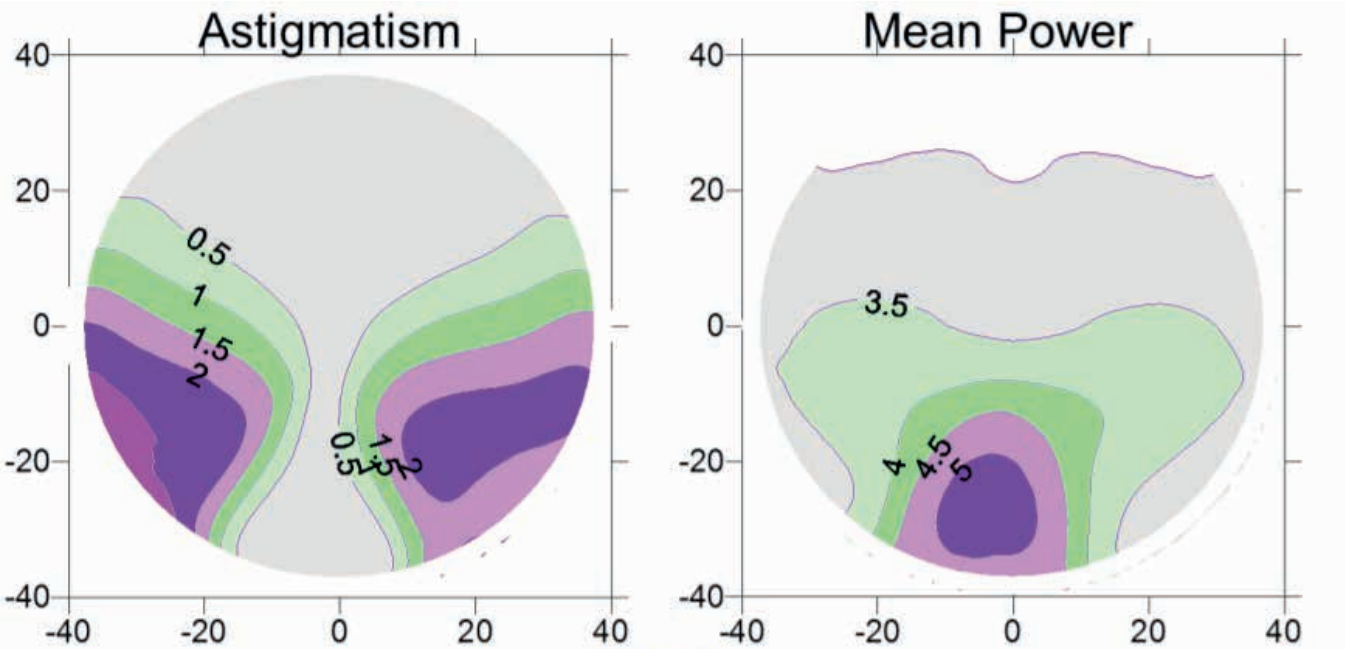

Figure 6

The ray traced astigmatism plot (Figure 6) now compares very favourably with the original parallel light astigmatism plot (Figure 2) with the same wide clear distance area, astigmatism free channel leading to a generous, useable reading area that widens as the eye continually moves downwards.

Short Summary

EyeView Technology improves lenses for real life viewing. This is necessary because ophthalmic lenses have oblique power errors which are present when viewing away from the optical centre of the lens.

EyeView technology uses specially developed software which incorporates the results of ray tracing over the entire lens to correct for these errors

Custom U Wide powered by Digital EyeView

Custom V+ Wide powered by Digital Eyeview