what makes a progressive lens successful?

Three elements are critical for success.

Measurements of viewing areas are often used to compare progressive lens designs. Yet it is not the size of any specific zone within a lens that determines its ultimate success. Rather, it is the functionality of viewing areas that, when combined with softness and smoothness, is what’s critical to the ultimate success and patient comfort of a progressive lens design.

The design of the new Novel progressive from Vision-Ease Lens balances these three elements for exceptional comfort and success. Novel lenses are ideal for the broadest range of wearers.

Viewing areas: size and location

Size

The fovea is the sweet spot for sharp central (foveal) vision within the eye. It is the small area within the central retina that is densely packed with cones, the photoreceptor cells responsible for high-resolution vision.

The size of the fovea is a visual angle of around 10 degrees; thus, 10 degrees is the minimum area of precise power required for tasks such as reading, computer use or driving.

A bigger viewing area isn’t necessarily better.

In fact, a wider viewing area can be worse.

A progressive lens design with very large viewing areas necessarily compromises vision in the periphery because it requires a greater slope of change as astigmatic power is introduced, resulting in a harder lens design. Harder lens designs can result in compromises for the patient, including swim, a disconcerting feeling of motion, and the formation of visual borders, which impede comfortable movement of the eye.

In the structure of the human ocular system, most eye movement is within 15 degrees and virtually all eye movement is within 30 degrees.

The Novel progressive lens has generous viewing areas that are more than adequate for the 10 degrees of central foveal vision.
Novel’s distance viewing area is 43 degrees, over four times what is needed. This is beneficial for successful fitting and patient comfort. It also reduces the need to maintain an exact position of wear, a problem for many patients over time.

The intermediate viewing area is 15 degrees, 50% more than needed. This is beneficial for mid-range tasks like viewing one’s computer screen or vehicle dashboard. It also reduces the need to continuously adjust one’s angle of view while utilizing the mid-range.

Novel’s near viewing area is 18 degrees, almost double what is needed. This is beneficial for tasks such as reading or crafting, as it offers a wide range of near vision.

To be functional, the viewing areas of the lens must be large enough for central foveal vision and in the right location for optimum ergonomics.

**Location**

Along with adequate size, location of the viewing areas is also critical. For natural head and eye movement, the optimum angle of view is 30 degrees for near objects; presbyopes will begin to read at 24 degrees. The optimum angle of view is 18 degrees for intermediate visual tasks.

In order for viewing areas to be functional, they must provide adequate power continuously from the distance area through the intermediate and near areas.

**Binocular Vision**

Viewing areas that are aligned correctly for binocular vision have wider usable near and intermediate areas. When a patient is wearing a corrective lens, his or her rate of convergence is not only a function of reading distance, but also of the power of the lens. The effective binocular visual field is larger when inset varies by base curve.

The Novel lens’s inset changes systematically across the base curves to balance the difference in convergence of the eye, accommodating for myopia and hyperopia and resulting in clear and stable near vision across all Rx powers.

The functionality of viewing areas, both in terms of size and location, is the first of three critical elements of progressive lens design. Novel’s viewing areas are also optimized for the second critical element of progressive lens design: softness.
Smoothness

The ability for the patient to fully utilize a lens throughout the power transition is a result of the smoothness of a progressive lens design. The smoothness of change from distance power to near power is the third critical element of the ultimate success and patient comfort of a progressive lens design.

Smoothness is achieved through a gradual slope or rate of power change as perceived by the wearer while their eyes move through the lenses from distance to near. A smooth power transition helps the wearer by eliminating the quick power changes that patients experience as image jumps. This ensures the patient’s ability to use the lens to precisely view objects at any distance between near and far.

Softness

A soft lens design, along with smoothness and functional viewing areas, allows the wearer to use the whole lens comfortably and naturally.

The eye has a lower tolerance for changes in astigmatic power, which result in distortion, than it does for changes in additive power, which result in blur. This is especially true in the area of the retina used for peripheral vision, which we use to detect motion and quickly identify objects.

If astigmatic power is introduced too quickly, it can result in swim and the sense of visual borders. Mathematically, the softness of a progressive lens design is measured by the slope or rate of change of astigmatic power away from the visual corridor of the lens. Novel, a soft lens design, introduces astigmatic power at a gradual rate, thereby allowing the patient to easily detect motion and identify objects in the periphery.
Novel lenses are truly wearable for presbyopes of all ages.

Marketing claims based on extremely wide viewing area measurements may come across as impressive, but those designs may result in actual lenses that are difficult to fit and unsettling to wear. The Novel lens, a balanced progressive that is truly wearable, will effectively combine the critical elements of functional viewing areas, softness and smoothness for a comfortable wearer experience.

In the distance, Novel lenses offer a generous viewing area. This is beneficial for successful fitting and patient comfort. It also reduces the need to maintain an exact position of wear, a problem for many patients over time.

In the periphery, Novel lenses offer an extremely soft design, making the lens easy to wear by eliminating the feeling of visual borders and maintaining the wearer’s ability to detect motion and quickly identify objects.

In the intermediate and near areas, Novel lenses offer wide viewing throughout, an exceptionally smooth transition from distance to near and maximized binocular vision in all prescriptions.

Novel lenses have a 13mm corridor and a 16.5mm fitting height. They are the ideal choice for presbyopes of all ages who want a comfortable, all-purpose progressive lens.