CLAIMS

1. A multifocal ophthalmic lens with an optic zone comprising a plurality of concentric rings, wherein the concentric rings include:

a plurality of odd-numbered concentric distance rings including an inner zone, wherein each odd-numbered concentric distance ring has a dioptric power that satisfies a distance refraction need of a patient;

a plurality of even-numbered concentric rings including an outer margin, wherein the even-numbered concentric rings alternate with the odd-numbered concentric distance rings, and wherein each even-numbered concentric ring has a dioptric greater than the dioptric power of the odd-numbered concentric distance rings;

wherein the odd-numbered concentric distance rings are configured so that 1) an image quality on the retina of the patient is superior to the image quality both in front of the retina and behind the retina, and 2) an image quality in front of the retina of the patient is superior to the image quality behind the retina;

wherein the odd-numbered concentric distance rings have a dioptric power given by $P_1(r)$=Spherical Refraction+Δ_1 +$(SA_1)*r^2$, wherein SA_1 is approximately -0.08 D/mm^2, r is distance from the center of the lens, wherein SA_1 is set to be approximately the spherical aberration of the eye, Spherical Refraction is the spherical refraction of the patient in Diopters, and Δ_1 is a specified shift in power to ensure that the peak vision is when viewing a distant object with an unaccommodated eye and ranges between -0.25 D and 0.25 D;

wherein the visual acuity or image quality at 0.0D of defocus is greater than -1.0 in -10logMAR units;

wherein at least one of:

each of the odd-numbered concentric distance rings have a substantially equal first dioptric power other than any variance to correct for spherical aberration of the eye; and

each of the even-numbered concentric rings have a second substantially equal dioptric power other than any variance to correct for spherical aberration of the eye;

wherein the odd-numbered concentric distance rings have a dioptric power of -0.5D to -10.0D; and

wherein each even-numbered concentric ring has a dioptric power given by P_2r=Spherical Refraction+ADD+$(SA_2)*r^2$ wherein SA_2 ranges between 0.0 and -0.15 D/mm^2 and ADD ranges between 1.0 and 4.0 D.

2. The multifocal ophthalmic lens according to Claim 1, wherein a peak of a through-focus vision curve for pupil sizes from 1 to 7 mm in diameter is at 0.0D defocus position.

3. The multifocal ophthalmic lens according to Claim 1, wherein the optic zone corresponds to a pupil size of about 3 mm to 6 mm.

4. The ophthalmic lens according to Claim 1, comprising four concentric rings.

5. The ophthalmic lens according to Claim 1, comprising six concentric rings.

6. The ophthalmic lens according to Claim 1, wherein the ophthalmic lens comprises a contact lens.

7. The ophthalmic lens according to Claim 1, wherein the ophthalmic lens comprises an intraocular lens, a corneal inlay, or a corneal onlay.

8. A method of designing a multifocal ophthalmic lens comprising a plurality of concentric rings for the mitigation of myopia progression, wherein the method comprises the steps of:

selecting a first dioptric power profile of a plurality of odd-numbered concentric distance rings including an inner zone, wherein the first dioptric power profile provides a dioptric power substantially equal to the distance refraction of the patient;

selecting a second dioptric power profile of a plurality of even-numbered concentric rings including an outer margin, wherein the even-numbered concentric rings alternate with the odd-numbered concentric distance rings and wherein the second dioptric power profile is greater than the first dioptric power profile;

assessing a combination of the first and second dioptric power profiles to determine an image quality on the retina, an image quality in front of the retina, and an image quality behind the retina;

wherein the odd-numbered concentric distance rings have a dioptric power given by $P_1(r)$=Spherical Refraction+Δ_1 +$(SA_1)*r^2$, wherein SA_1 is approximately -0.08 D/mm^2, r is distance from the center of the lens, wherein SA_1 is set to be approximately the spherical aberration of the eye, Spherical Refraction is the spherical refraction of the patient in Diopters, and Δ_1 is a specified shift in power to ensure that the peak vision is when viewing a distant object with an unaccommodated eye and ranges between -0.25 D and 0.25 D;

modifying the second dioptric power profile until 1) an image quality on the retina is superior to the image quality in front of the retina and behind the retina and 2) an image quality in front of the retina is superior to the image quality behind the retina, and

wherein the image quality at 0.0D of defocus is greater than -1.0 in -10logMAR units;

wherein at least one of:

each of the odd-numbered concentric distance rings have a substantially equal first dioptric power other than any variance to correct for spherical aberration of the eye; and

each of the even-numbered concentric rings have a substantially equal second dioptric power other than any variance to correct for spherical aberration of the eye;

wherein the odd-numbered concentric distance rings have a dioptric power of -0.5D to -10.0D; and

wherein each even-numbered concentric rings has a dioptric power given by P_2r=Spherical Refraction+ADD+$(SA_2)*r^2$ wherein SA_2 ranges between 0.0 and -0.15 D/mm^2 and ADD ranges between 1.0 and 4.0 D.