Claims

1. A kit for use in preventing or slowing the development or progression of myopia, the kit comprising:

a first set of contact lenses, wherein each lens in the first set of lenses includes an optic zone and a peripheral zone surrounding the optic zone, the peripheral zone of each lens having a varying thickness profile that is configured to control rotation of the lens, and the optic zone of each lens comprising:

a central region, the central region having a first optical axis and a curvature providing a base power;

an annular region, wherein the annular region circumferentially surrounds the central region, and wherein the annular region comprises a treatment zone having a characteristic that reduces the contrast of an image that is formed by light passing through the central region and the treatment zone compared to an image of an object that would be formed by light passing through only the central region, the treatment zone of each lens comprising at least one of:

(a) an add power region having a curvature providing an add power, wherein light from each distant point object is focused by a treatment zone to form a focused arc at a proximal focal surface, the arc being outside of and extending in a direction around a blur circle formed by the light focused by the central region;
(b) a feature that increases scattering of light passing through the treatment zone compared to light passing through only the central region; and
(c) a characteristic that causes diffraction of light passing through the treatment zone; wherein

the treatment zone is rotationally positioned, relative to the peripheral zone thickness profile, at a different angle about the optic axis in each lens in the set of lenses; and

a second set of contact lenses having the features of the first set of lenses, wherein for each lens in the first set of lenses having a treatment zone that is rotationally positioned, relative to the peripheral zone thickness profile, at a first angle about the optical axis, there is a corresponding lens in the second set of lenses that has a treatment zone that is positioned relative to the peripheral zone thickness profile, at an equal and opposite angle about the first optical axis, and wherein the first set of contact lenses are a set of lenses for the left eye of a wearer, and the second set of lenses are a set of lenses for the right eye of the wearer, or vice versa.

2. The kit according to claim 1, wherein the treatment zone of each lens is provided over a continuous portion of the annular region of each lens, and wherein the treatment zone spans less than 50% of the area of the annular region of each lens.

3. The kit according to claim 1 or claim 2, wherein a plurality of unconnected treatment zones span the annular region of each lens.

4. The kit according to any preceding claim, wherein the treatment zone of each lens comprises a strong contrast reduction region that reduces the contrast of an image that is formed by light passing through the central region and the treatment zone compared to an image of an object that would be formed by light passing through only the central region by 50% or more.

5. The kit according to any preceding claim, wherein the treatment zone of each lens has a curvature variation that provides an add power, and wherein, in each lens, at least some of the add power is provided by curvature that is centred on a centre of curvature that is a first distance from the first optical axis.

6. The kit according to claim 5, wherein the treatment zone of each lens has an asymmetric power profile.

7. The kit according to any of claims 5-6, wherein for each lens, the curvature providing the add power may be a curvature of the anterior surface of the lens.

8. The kit according to any of claims 5-7, wherein the add power provided by the treatment zone of each lens is between +0.5 and +10.0 D.

9. The kit according to any preceding claim, wherein the treatment zone of each lens may include a feature that increases scattering of light passing through the treatment zone compared to light passing through only the central region, and wherein the feature is disposed on an anterior surface of the annular region.

10. The kit according to any preceding claim, wherein the annular region of each lens has a substantially circular outer circumference.

11. The kit according to any of claims 1-10, wherein the annular region of each lens has a substantially elliptical outer circumference.

12. The kit according to any preceding claim, wherein the central region of each lens is substantially circular in shape and has a diameter of between 2 and 7 mm.

13. The kit according to any preceding claim, wherein the annular region of each lens extends radially outwards from a perimeter of the central region by between 0.5 and 1.5 mm.

14. The kit according to any preceding claim, wherein each lens comprises an elastomer material, a silicone elastomer material, a hydrogel material, or a silicone hydrogel material, or mixtures thereof.

15. The kit according to any preceding claim, wherein each lens is formed using a lathing process.

16. The kit according to any preceding claim, wherein the varying thickness profile of each peripheral zone is a prism ballast.

17. The kit according to any preceding claim, further comprising:
a set of contact lenses according to any of claims 1-16;

packaging for supplying the set of contact lenses to a user, and
written instructions indicating an ordering sequence for wearing the lenses.

18. The kit according to claim 17, wherein the written instructions are provided on the packaging or on the lenses.

19. A method of manufacturing a first set of contact lens and a second set of contact lenses for use in a kit according to any preceding claim, the method comprising:

(a) forming a first contact lens for a first set of contact lenses, wherein the lens includes an optic zone and a peripheral zone surrounding the optic zone, the peripheral zone of each lens having a varying thickness profile that is configured to control rotation of the lens, and the optic zone of each lens comprising:

a central region, the central region having a first optical axis and a curvature providing a base power;

an annular region, wherein the annular region circumferentially surrounds the central region, and wherein the annular region comprises a treatment zone having a characteristic that reduces the contrast of an image that is formed by light passing through the central region and the treatment zone compared to an image of an object that would be formed by light passing through only the central region, the treatment zone of each lens comprising at least one of:

(i) an add power region having a curvature providing an add power, wherein light from each distant point object is focused by a treatment zone to form a focused arc at a proximal focal surface, the arc being outside of and extending in a direction around a blur circle formed by the light focused by the central region; (ii)a feature that increases scattering of light passing through the treatment zone compared to light passing through only the central region; and

(iii) a characteristic that causes diffraction of light passing through the treatment zone;

(b) repeating step (a) to form a second contact lens in the first set, wherein the treatment zone is rotationally positioned, relative to the peripheral zone thickness profile, at a different angle about the optic axis in the first lens and the second lens; and

(c) repeating steps (a) and (b) to form a second set of contact lenses, second set of contact lenses having the features of the first set of lenses, wherein for each lens in the first set of lenses having a treatment zone that is rotationally positioned, relative to the peripheral zone thickness profile, at a first angle about the optical axis, there is a corresponding lens in the second set of lenses that has a treatment zone that is positioned relative to the peripheral zone thickness profile, at an equal and opposite angle about the first optical axis, and wherein the first set of contact lenses are a set of lenses for the left eye of a wearer, and the second set of lenses are a set of lenses for the right eye of the wearer, or vice versa.