HydroKone™

A Soft Contact Lens for Keratoconus

Indications

- An alternative to Rigid Gas Permeable lenses for fitting keratoconic eyes.
- For all stages of the disease, but most often employed in advanced keratoconus when the patient has failed to tolerate RGP lenses or RGP lenses are scarring the cornea.
- Often succeeds when RGP/Soft lens combinations fail.

Description

The posterior surface of the lens consists of a steep central curve, flatter para-central curve, and a final peripheral curve. All curves are aspheric with the central curve computed by a complex polynomial formula; it approximates hyperbolic aspheres in larger sagittal depths. The para-central curve is similar in design to the base curve of a standard soft lens and the 8.6 mm. radius curve with a 14.8 mm. diameter should fit the majority of eyes.

The anterior surface has a central optical portion, which quickly tapers to thinner flange curve to maximize oxygen to the cornea. It has about the same total lens mass as a standard high plus soft lens. When residual astigmatism indicates that a toric lens is needed, double slab-off ballasting is used to stabilize lens rotation.

HydroKone soft contact lens for treatment of keratoconus. Note paracentral corneal scar (arrow) near the visual axis.

Materials Available

- **Hioxifilcon A** (standard), Glycerol Methacrylate polymer with 59% water content. This material is known for more resistance to dehydration, less flexure, and better optical properties than other soft lens materials.
- **Methafilcon A** is widely used for toric and specialty lenses and is known for good durability.
- Our staff can guide you in the selection of the best polymer for each case.

Parameters Available

Base Curves	4.1 mm to 9.3 mm		
Diameter	12.0 mm to 17.0 mm		
BV Powers	+50.00 D. to -75.00 D. in 0.25 D. steps		
Cylinder (toric)	-0.25 D. to –15.00 D. in 0.25 D. steps		
Axis (toric)	1° to 180° in 1° steps		
Colors	Clear or Visi Tint Blue		
Material (standard)	Hioxifilcon A	59% water	24 Dk
Material	Methafilcon A	55% water	18 Dk

Designs Available

Standard	Central Steep Zone	Typical (mild or advanced)
Globus	Large Sagittal Depth	Ectasia of most of cornea
Pellucid	Reverse Geometry	Ectasia of large sector of cornea
Diagnostic Lenses	14.8 diameter (standard)	8.6 paracentral fitting curve
9 Lens Dx Set	5.3, 5.7, 6.1, 6.5, 6.9, 7.3, 7.7, 8.1, 8.5 base curves	
6 Lens Dx Set	6.5, 6.9, 7.3, 7.7, 8.1, 8.5 base curves	

- All lenses are covered by a manufactures guarantee that they are to specification & free from defects.

Diagnostic Lens Fitting Method

Fitting Theory

The goal is to fit as much normal peripheral cornea and sclera as possible with the para-central and the peripheral curve in much the same way you would fit a standard soft lens. Then fit the central curve that has the proper sagittal depth to lightly touch the central cornea. It is highly recommended that a diagnostic lens be used to evaluate the fit of the Hydrokone lens. However, expect a low riding lens due to decentered cones and expect more movement than seen with standard soft lenses.

The radius of the central curve differentiates lenses in the diagnostic set. The smallest radius has the largest sagittal depth. Although the basic Diagnostic lenses are all 14.8 mm diameter and 8.6 mm para-central radius, other parameters are available.

1. Select Initial Base Curve

- Use the chart below to select the radius of the initial lens based on the AVERAGE of the steepest and flattest K-readings.
- If K-readings are not available or reliable, choose the 7.30 lens as the initial diagnostic lens.
- When needed, other base curves and para-central curves are available.

Flat K	Label	Para-Central Curve Radius	Total Lens Diameter
43.00 to 46.99	8.50		
47.00 to 49.99	8.10		
50.00 to 52.99	7.70		
53.00 to 55.99	7.30	8.6 mm in standard Diagnostic Set	14.8 mm in standard Diagnostic Set
56.00 to 58.99	6.90		
59.00 to 61.99	6.50		
62.00 to 64.99	6.10		
65.00 to 67.99	5.70		
68.00 to 72.00	5.30		

2. Evaluate the two areas of lens

CENTRAL CURVE - Under slit-lamp examination, the central curve area should be free of folds and air bubbles beneath the lens. Since the fit of the central curve determines the quality of the optical system, it is best determined by optical methods.

- **Keratometry** over the lens should show RELATIVELY crisp mires with REGULAR astigmatism.
- **Retinoscopy** over the lens should look like that from a standard soft lens in the central 3 to 4 mm; the aspheric posterior and tapered front anterior make evaluation of the reflex through the pupil peripheral to 4 mm. very difficult
- **Refraction** over the lens (sphere and cylinder) should give a stable endpoint with acuity comparable to the best acuity expected from this patient.

The optimal central curve is the one that lightly touches the central cornea and gives the least fluctuations in any of these findings. A larger radius will correct for a central curve that is too steep and vaults the cornea. A smaller radius will correct for a central curve that rests excessively on the central cornea leaving too little contact between the cornea/sclera and the para-central curve.

PARA-CENTRAL CURVE - Look for the characteristics of a standard soft lens fit. Edge buckle, edge lift, or excessive movement indicates a loose lens. Order a lens with the para-central curve whose radius is steeper by 0.3 mm or more (Ex: from the standard 8.6 mm to 8.3 mm). Compressed vessels or little lens movement indicate a tight para-central curve. Use an 8.9 or greater para- central radius to correct a tight fit.

3. Order the lens by

- Central Radius
- Power (Sphero-cylinder over-refraction or Final power)
- Para-central curve radius (Ex: 8.0, 8.3, 8.6, 8.9, 9.2, etc.)
- Diameter (Ex. 14.8, 14.5, etc)

4. Notes

- When the area of the cornea manifesting the disease is large or significantly decentered, please contact our consultants for alternate designs. We can adjust the parameters of the lens to accommodate most of these situations.
- **The Pellucid Hydrokone™** design is indicated for eyes where the cornea exhibits para-central steepening in a larger area, than in standard keratoconus cases. The posterior surface incorporates reverse geometry: that is, the para-central curve is steeper than the central curve. This design is also used in post corneal transplant cases where the peripheral cornea is steeper than the central cornea.
- **The Globus Hydrokone™** design is indicated for fitting eyes that exhibit a large sagittal depth due to steepening of most of the cornea.
- For both the Pellucid and Globus Hydrokones™, the para-central curves vary with the central curve radius and will appear on the label of the vial.

Please contact our consultants for design assistance at **877.533.1509.**

We can adjust the parameters of the lens to accommodate most situations.