



KERACARE
SCLERAL LENS

KERACARE

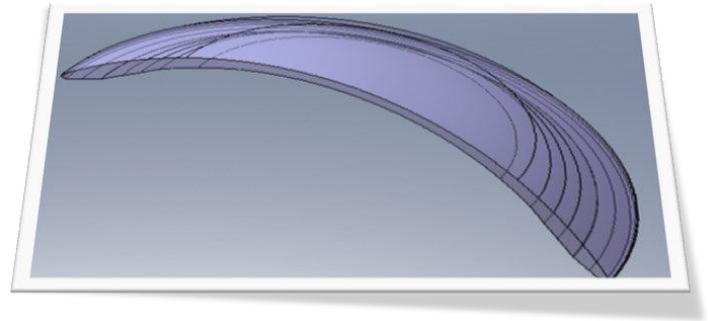
Keracare - A Life Changing Product

Keracare scleral lens is a semi-scleral design used in the treatment for restoration of vision and corneal health in patients with dry eye and corneal irregularities.

Ability

- **Restore** vision in a compromised cornea.
- **Create** an artificial tear layer to help and improve dry eye symptoms.
- **Provide** exceptional optics through the advancements of computer controlled equipment and 3-D design software.
- **Change** the life of your patients through better vision, lens comfort and patient care.
- **Comfort** is unsurpassed no matter how irregular the cornea.





CONCEPT

Our **Keracare** lens concept is simple. By adjusting the **optical zone** you can obtain the ideal clearance over the apex of the cornea out to the limbal region of the eye. In turn, this creates a reservoir of fluid under the lens maintaining corneal health.

Additionally, the **scleral landing area** is designed to smoothly transition onto the conjunctiva creating a stable well fitting lens.

Keracare scleral lenses have been developed to cover a diverse range of corneal shapes including advanced Kerataconus and Pellucid to Post Surgical and Corneal Trauma.

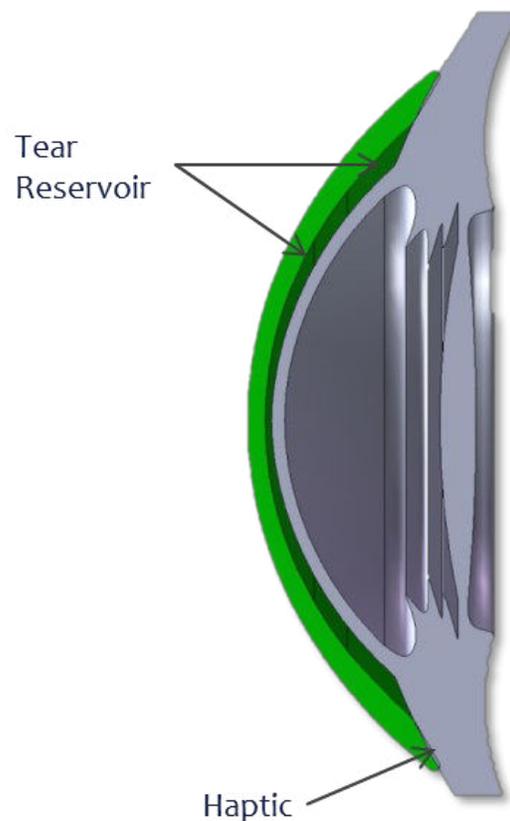
The **Keracare** design employs a proprietary multi-curve aspheric back surface to achieve optimal corneal alignment even in cases of markedly distorted corneas. The **Keracare** design consists of an extensive range of diameters and SAG values to allow for optimization of lens fit. Spherical and front surface toric designs are also available to maximize vision.

All **Keracare** scleral lenses are 100% custom made and come with a 6 month warranty.

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The standard **Keracare** trial set includes 12 diagnostic lenses in 2 different diameters with varying optic zones. This set usually will correct multiple types of corneal disorders.

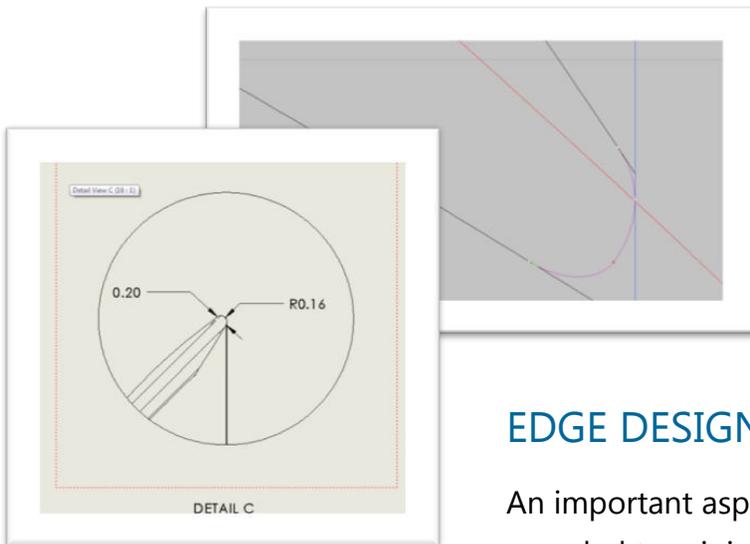
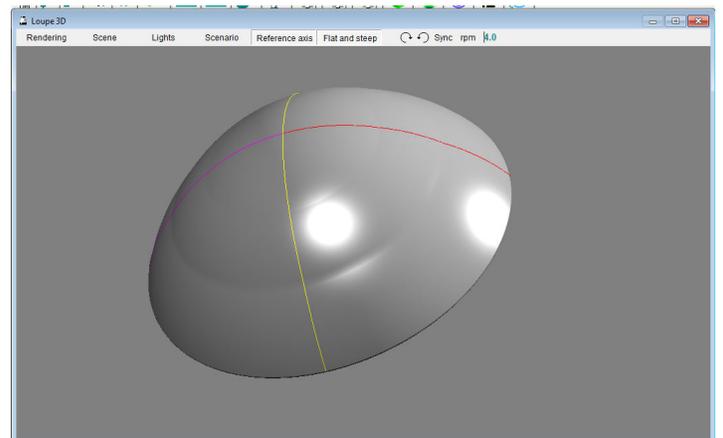
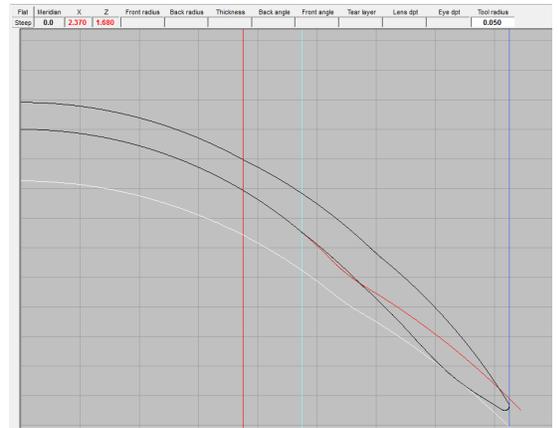
The **Keracare** scleral lens can be custom designed for any patient and eye disorder.



Keracare

The **Keracare** Scleral Lens is manufactured in **Optimum Extra** material providing exceptional oxygen transmissibility and clarity.

Keracare lenses are designed and manufactured using the most recent advancements in **CAD/CAM** software and computer controlled **CNC** lathing. This gives exceptional repeatability and 100% customization for each patient.



EDGE DESIGN

An important aspect of the **Keracare** design is the edge profile. It is well rounded to minimize impingement into the conjunctiva while allowing the lens to rest easily on the eye.

FITTING GUIDE: Keracare Scleral Lens

Lens Design

Keracare scleral lens is a semi-sclera design. It performs exceptionally well on dry eyes and irregular corneas including keratoconus, corneal trauma, pellucid marginal degeneration, penetrating keratoplasties, post LASIK and RK patients. It incorporates a proprietary multiple posterior curve system to obtain corneal alignment. Patients who wear **Keracare** will have unsurpassed comfort and clarity throughout the day. The standard trial lens set contains 15.9 mm and 16.4 mm diameters in non-fenestrated material.

Pre-Fitting Examination

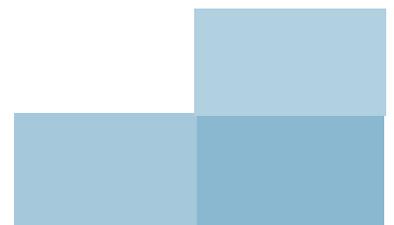
It is recommended that corneal topography be done, taking note to the symmetry of the cornea. Your initial base curve should mimic the cornea's shape. (steep cornea steeper base curve; flat cornea flatter base curve)

Selection Lens Size

The standard **Keracare** trial lens set has the following diameters 15.9 mm and 16.4 mm. These designs are independent of each other and work well on wide variety of patients. The overall diameter of the lens should extend at least 2 mm beyond the limbal area of the eye. This is very important since **Keracare** needs to bear primarily on the sclera and not the cornea.



Proper Lens Diameter

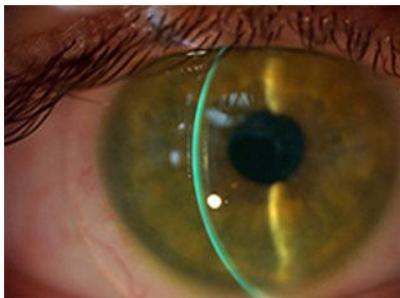


Choosing Base Curve and SAG

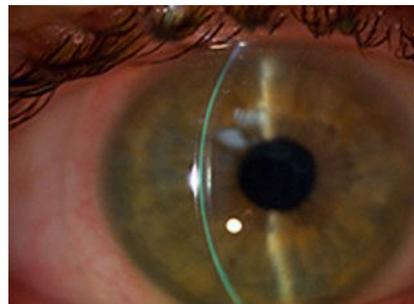
The most difficult parameter to determine on a distorted cornea is the initial trial lens. The **Keracare** lens is fit by SAG value and not base curve. However, the base curve does need to mimic the cornea. i.e.: use a steeper base curve on steeper corneas and flatter base curves on flatter asymmetric corneas such as Pellucid, LASIK, and RK eyes. Below is a suggested initial base curve / SAG guide. (Yellow denotes first lens choice).

Moderate Cone Advanced Cone	Severe Cone Globus Cone	Pellucid	Post Surgical (Sunken—Lasik / RK / PK)	Post Surgical (Bulging) PK)
7.50 bc / 15.9 / 4.73 SAG	7.34 bc / 16.4 / 5.41 SAG	7.50 bc / 15.9 / 4.73 SAG	7.85 bc / 16.4 / 4.82 SAG	7.34 bc / 16.4 / 5.41 SAG

A properly fit lens will have alignment over the cornea. The ideal vault will have 250 microns clearance over the steepest part of the cornea at initial insertion. ***Your goal is to find the minimum SAG Value that vaults the cornea with no apical bearing with a clearance of 250 microns (at the time of fitting before the lens has had an opportunity to settle).***



**Ideal Vault
250 Micron Clearance
Initial Trial Insertion**



**Ideal Vault
150 Micron Clearance
After Settling**

Calculating Lens Power

Lens power is best determined by over-refraction. The spherical and or the cylinder value of the over-refraction are simply added to the trial lens power to determine the correct power.

Centre Thickness

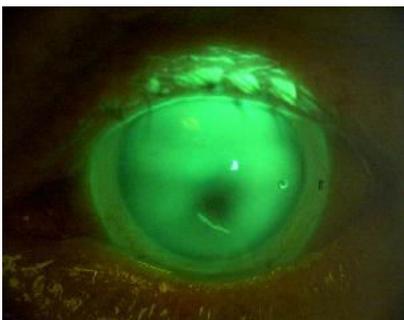
Centre thickness is a function of lens design and should be calculated by the laboratory.

Fluorescein Pattern

Lens selection should be aided by an examination of the fluorescein pattern.

It helps to place the fluorescein in cup of the lens at insertion. The most accurate way to determine the proper SAG is to evaluate a trial lens that has apical touch. If there is central bearing the SAG value should be increased by 0.1mm for every 1.0mm of touch.

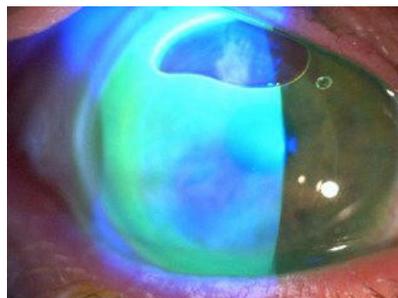
You goal is to determine the SAG that vaults the cornea with no apical touch. The ideal pattern will align cornea to the limbus and it will vault the **steepest part of the cornea by 250 microns**. Once that is obtained, a close evaluation of the periphery is needed. There should not be any excessive edge lift or worse impingement in the conjunctiva. If there is excessive lift or impingement in the periphery, the lens edge should be adjusted.



2 mm touch / 4.20 SAG



No Touch / 4.40 SAG



**Too Flat / Heavy Central Bearing with Limbal Bubble
Increase SAG Value by 0.3 - 0.4mm**

Bubbles

Sometimes at insertion a false bubble can be induced. It is very important when inserting the lens that it be filled fully with saline and placed on the eye with the head down and parallel with the table top. You do not want any bubbles as they will cause the cornea to become dry within those areas.



Proper Position



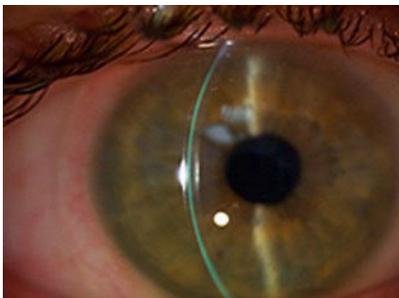
Induced Bubbles

Edge

A proper edge should not lift off of the sclera or more importantly impinge into it. An edge that lifts excessively will cause lens awareness while an edge that impinges can cause edema, redness and discomfort. If the edge is not aligned with the sclera recheck to make sure that you have **an appropriate SAG that vaults the cornea**. If you do have the appropriate SAG with an incorrect edge call our consultation department for advice on peripheral curve changes.

Ideal Fit

The lens should align the cornea with 150 microns of clearance after settling. There should not be any bubbles under the optical cap (too steep of a SAG) or over the limbus (too flat of a SAG). A **Keracare** lens will have very minimal to no movement. In addition, attention should be observed at the periphery. There should not be any conjunctival impingement or excessive edge lift.



**Ideal 100 Micron Clearance
After Settling**



Ideal Edge

Insertion & Removal

Make sure your patient understands the importance of proper insertion and removal. When inserting a **Keracare** it is important that the concave surface be fully filled with saline so as to reduce the risk of induced unwanted bubbles. Most patients find that holding the lens between the index and middle finger or using a lens insertion tool works best. Since **Keracare** tends to settle on the eye, it needs to be pre-loosened before removal. We recommend irrigating with saline and massaging the lens prior to removing the lens with a DMV suction cup. (Refer to our care and handling video on our website for more detailed instructions).



Insertion Tool

Troubleshooting

While not common, corneal edema may occur in some patients. A lens with too much vault can cause this. Make sure to re-evaluate your SAG value. ***It should be the minimum SAG that vaults with no apical bearing (100-150 microns after settling).*** Another cause may be that the periphery of the lens is impinging into the conjunctiva. If this occurs flattening the PC's while maintaining the appropriate SAG is indicated. Lens awareness can occur if there is too much edge lift. Excessive edge lift is caused by either the PC's being too flat or the lens SAG being too low. If excessive edge lift is observed you should first determine if the SAG is appropriate. Often when the SAG is increased, the edge will improve.

If the lens SAG is correct then a steeper periphery is indicated. The two most common causes for SPK are either from preservatives in the solution or excessive bearing on the apex. Because these lenses have very little or no movement, tear exchange is very slow to occur. Therefore, it is very important that a non-preserved saline be used when inserting. This will eliminate any possibility of chemical irritation. On rare occasions metabolic debris accumulation can be an issue. Usually the patient will complain of decrease acuity after eight to ten hours wear. If this occurs have the patient remove, clean and re-insert during mid-day. Excessive redness can be a sign that the lens is fitting tight. Patients may complain that their wearing time is limited to only a few hours a day. Recheck the SAG to make sure it is at 150 micron apical vault (after settling) and adjust if necessary. If the SAG is appropriate then re-design with a flatter periphery.

ISSUE	CAUSE	RESOLVE
Corneal Edema	Too much vault	Re-evaluate lens SAG with fluorescein. Decrease SAG
Corneal Edema	Lens edge impingement	Flatten PC's/Maintain appropriate SAG
Excessive Edge lift	Low SAG	Re-evaluate lens SAG with fluorescein. Increase SAG
Excessive Edge lift/with correct SAG	Flat PC's	Steepen PC's
SPK	A preservative solution has been used	Must use preservative <u>free</u> solutions
SPK	Excessive bearing on the corneal apex	Re-evaluate lens SAG with fluorescein. Increase SAG
Decreased acuity	Metabolic debris	Remove, clean and re-insert during mid-day
Excessive redness	Tight fit/excessive SAG	Re-evaluate lens SAG with fluorescein. Decrease SAG
Excessive redness/with correct SAG	Tight PC's	Flatten PC's

Troubleshooting—continued

Fitting Pearls

- Lens Diameter should be at least 2mm larger than limbal area of the eye.
- Your 1st trial lens should be flat fitting. That way, you can very accurately adjust the SAG up.
- Central bearing, edge lift and/or limbal bubbles indicate a flat fit.
- Increase SAG value if there is a central bearing (0.1mm for every 1.0mm of bearing).
- Deep central pooling or central bubbles indicate a steep fit.
- Decrease SAG value if you have a steep fit.
- Ideal fluorescein pattern will be aligned at 150 microns of clearance after settling.
- Edge should not impinge or lift excessively off of the sclera.

****Your goal is to find the minimum SAG Value that vaults the cornea with no apical bearing (150microns after settling / 250 microns at insertion).***

Quick Fit Guide

STEP 1: Make sure the lens is large enough. The lens should be 2 mm beyond the limbus and should look like a large soft lens on the eye.

STEP 2: *This step is most important.* Find the minimum SAG value that vaults the cornea with no apical touch. If there is apical touch, increase the SAG value (.1mm SAG for every 1.0mm of touch) until the lens vaults the cornea 250 microns. (Clearance is best seen with a thin white slit beam. The green fluorescein band should be 1/5 as thick as a normal corneal thickness or as thick as the lens thickness.)

STEP 3: Check the edge. It should not impinge or lift excessively off the sclera.

STEP 4: Over refract for final correction.

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