

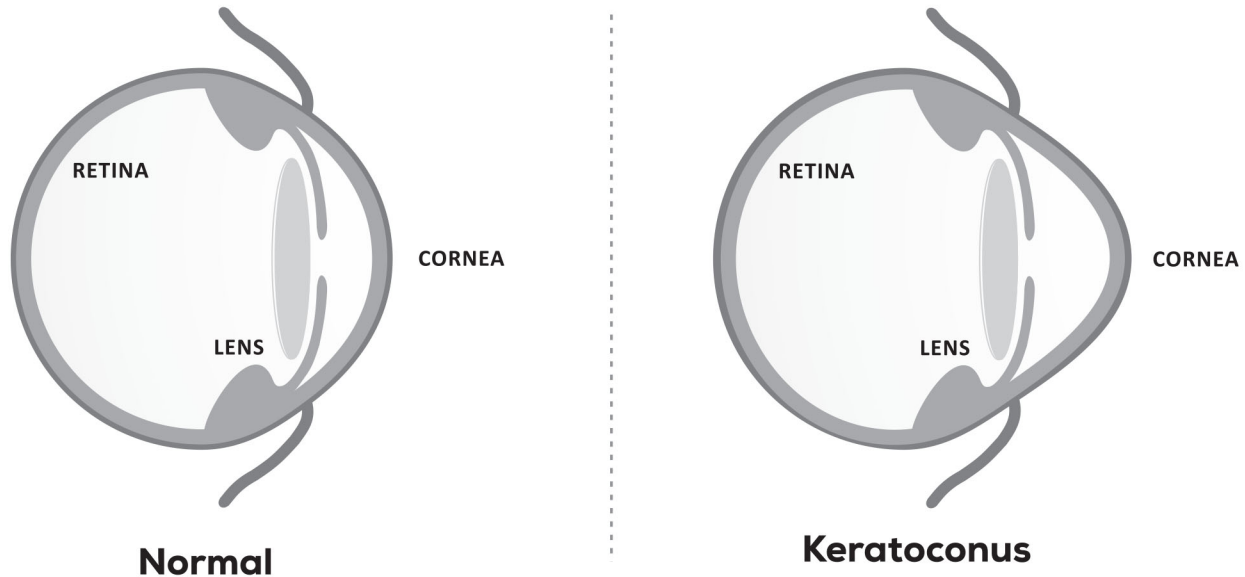
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BIORING

biotech

VISION CARE

BIORING

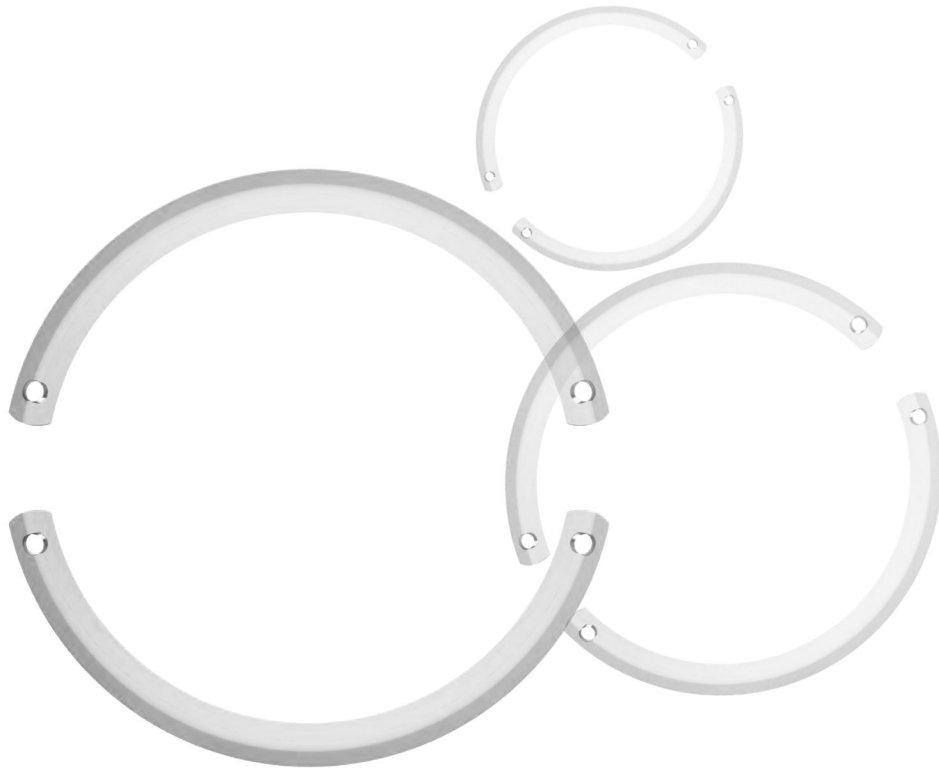


Keratoconus:

Keratoconus is characterized by thinning and steepening of the cornea and results in visual distortion often not correctable by traditional glasses.

Keratoconus is caused by decrease in protective antioxidants in the cornea. The corneal cells produce damaging by-products which increase oxidative stress. Normally, antioxidants protect the collagen fibers against oxidation. If antioxidants levels are low, the collagen weakens and the cornea bulges out.

The changes in the shape of the cornea can happen quickly or may occur over several years. The changes can result in blurred vision, glare and halos at night, and the streaking of lights.



Vision through Normal Eye



Vision through Eye with Keratoconus

BIORING & it's mechanism:

- **BIORING** is implantable device for the correction of surface irregularities of cornea & reduction of refractive errors associated with keratoconus & other corneal ectasia.
- **BIORING** implantation is intended to improve the patient's visual acuity, reduce or eliminate the refractive error & stabilize cornea which avoids or delays need of corneal transplantation.
- **Mechanism:** Corneal remodeling by addition technique keeping the corneal integrity intact.



BIORING offers...

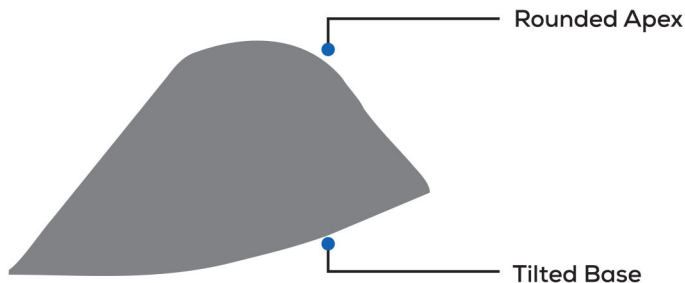
- **Adjustability:** Implant can be easily adjusted or repositioned to get desired refraction.
- **Better patient satisfaction:** "Quality of life" of patient is highly improved.
- **Reversibility:** BIORING can be explanted in case of mild infection. Cornea can be brought back in it's original shape.
- **Compatibility with other procedures:** BIORING is readily compatible with corneal collagen cross linking, PRK & Phakic IOL implantation.
- **Quick Visual Recovery:** It is minimum invasive technique, which allows patient to resume their normal life. Refractive & Topographic changes stabilize generally in 3 months.
- **No interference in corneal transplantation:** BIORING does not interfere in corneal transplantation, if at all it will be required.

Structural benefits:

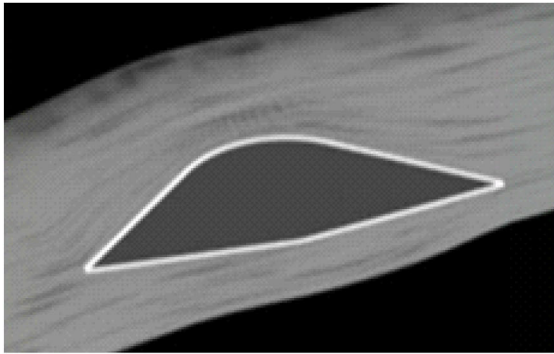
1. Round Apex:

Round Apex ensures less disturbances of post-op. structural integrity of stromal part as compared with pointed apex.

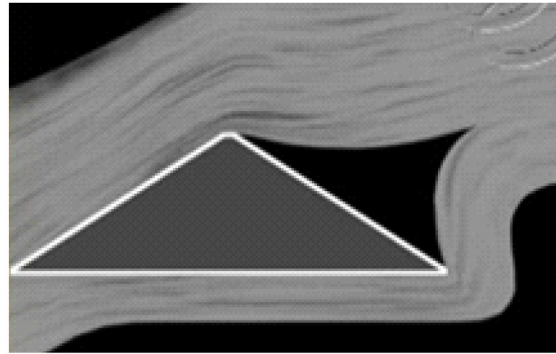
Cross Sections:



2. Base Design:



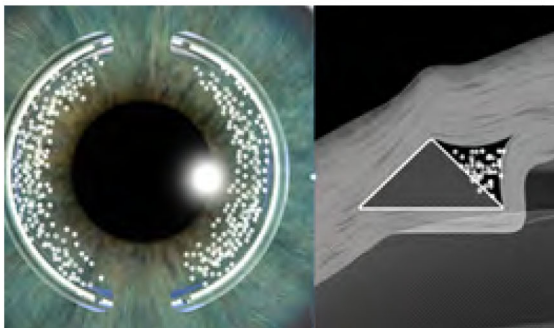
Tilted Base



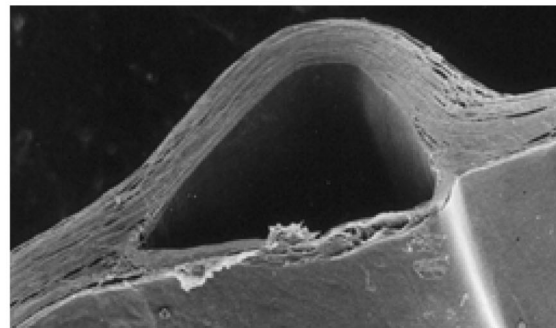
Flat Base

Advantages of Tilted base over Flat base:

Tilted base overcomes two basic limitations of Flat base.



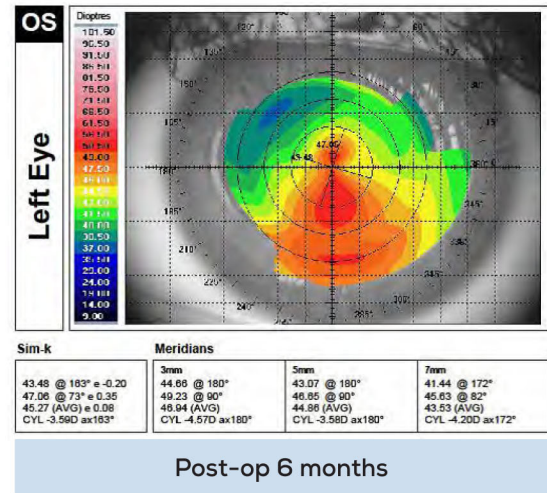
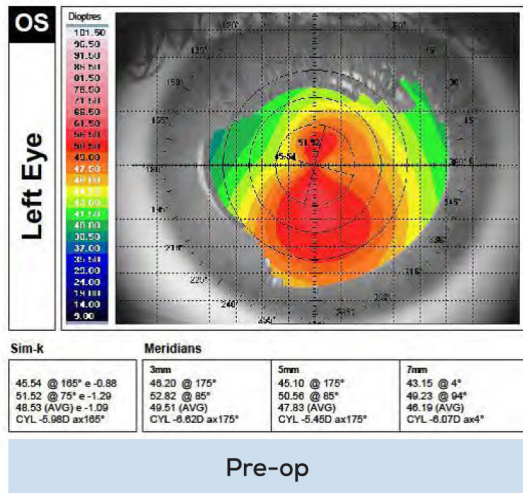
1. White Deposits



2. Endothelium Suffering

Corneal Topography Support:

Post - op reduction in corneal steepness as well as principal meridians value, which ensures reduction in amount of astigmatism.



Indications:

- Keratoconus with poor BSCVA
- Progressive keratoconus
- Pellucid marginal degeneration
- Post LASIK ectasia
- Irregular astigmatism
- High astigmatism secondary to penetrating keratoplasty
- Post trauma corneal irregularities

Contra-indications:

- Acute keratoconus with keratometry > 70 D
- Major central leucoma
- Edema
- Post-penetrating transplant, if the button is off-centered
- Severe atopy
- Recurrent corneal erosion syndrome
- High expectation of emmetropia without correction

Pre-operative Measurements:

A clear central cornea with a minimum corneal thickness as suggested in table of “Guideline for BIORING segment thickness” at the incision site and a mesopic pupil size of less than 6 mm are preferred. A careful slit lamp examination, refraction (dry and dilated), fundus evaluation and post-mydriatic tests need to be done. The peripheral pachymetry at the incision site is evaluated pre-operatively to ensure sufficient corneal thickness and appropriate depth of placement of the BIORING. The incision is planned on the axis of the positive cylinder to achieve maximum effect. Look for any mis-match between the steep K and the axis of the positive cylinder in the manifest refraction. Symmetric segments are used in central ectatic conditions whereas asymmetric segments are used in decentered ectasia.

Guideline for BIORING segment thickness

Segment Thickness	150 Micron	200 Micron	250 Micron	300 Micron	350 Micron
Minimum Corneal Thickness Required (6 mm Optical Zone)	250 Micron	335 Micron	420 Micron	500 Micron	580 Micron



Features & Benefits:

- **Delaying or eliminating needs of Corneal transplantation:** BIORING delays or eliminates need of corneal transplantation.
- **Variable Arc lengths & Thicknesses:** Different Arc lengths & Thicknesses offer options to surgeon to select segment as per need of the patient.
- **Greater Refractive Correction:** BIORING corrects low, moderate & high degrees of myopia and astigmatism.
- **User friendly online calculator:** Appropriate segment for particular patient can easily be found out using www.biotechcalculators.com

How to use online calculator:

Register yourself at www.biotechcalculators.com by adding basic information & create username & mail ID.

Once registered, enter user name & password and for the calculation, please enter parameters like Name of the patient, Age, Case no., Eye, Pathology, Ectasic distribution type, Ring optical zone, Keratometry data, Pachymetry data (if needed), Simulated refraction & BSCVA to get appropriate segment for particular patient.

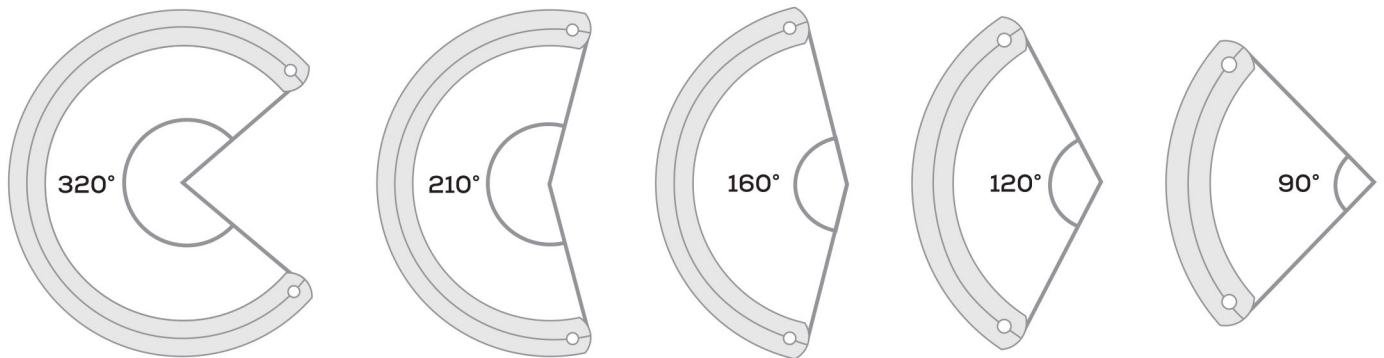
Satisfactometer will clearly suggest that whether it is good indication for BIORING or not for particular case.

www.biotechcalculators.com



Available Thicknesses, Arc angles & Diameter:

Thickness	150, 200, 250, 300 & 350 Microns
Diameter	5.0 mm
Arc Angle	90°, 120°, 160°, 210°, 320°



Implantation Technique:

BIORING can be implanted using Femtosecond LASER technique as well as Manual technique.

Parameters required for Femtosecond LASER Technique:

Inner Diameter	4.7 mm
Outer Diameter	5.9 mm

Instruments available for Femtosecond LASER Technique:

1. Spreader
2. Double Hook
3. Guide
4. Ring Holder Forceps
5. Clockwise Tunneler
6. Counter-clockwise Tunneler
7. 380° Tunneler

Instruments available for Manual Technique:



Double Marker



Spreader



Double Fixation Forceps



Ring Holder Forceps



Guide



Double Hook



Gauge



Pre-delaminator



Counter - Clockwise Tuner



Clockwise Tuner



380° Tuner

Diamond Knife



Bioring provides excellent outcome with precision:





Scan For
Surgery Video



BIOTECH VISION CARE PVT LTD | Block 1, Abhishree Corporate Park, Opp. Swagat Bunglow BRTS Stop
Bopal - Ambli Road, Ahmedabad - 380 058 Gujarat India. | Tel: +91 79 66823000
Email: indiasales@biotechhealthcare.com | intlsales@biotechhealthcare.com | www.biotechhealthcare.com