Acriva[UD]
Reviol Tri-ED
Trifocal+Enhanced Depth of Focus

Acriva[UD]
Reviol Tri-ED toric
Trifocal Toric+Enhanced Depth of Focus

Seamless Continuous Vision

VSY BIOTECHNOLOGY

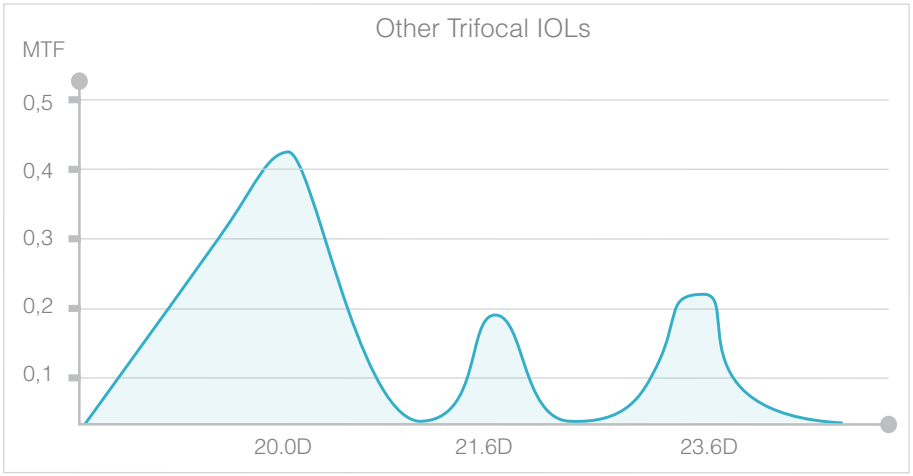
Trifocal Toric
Trifocal

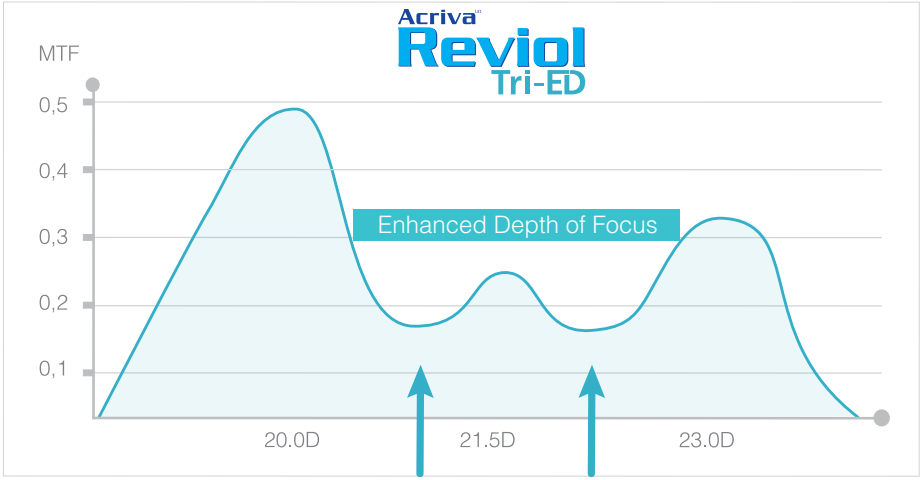
New Approach in Presbyopia Correction

Trifocal + Enhanced Depth of Focus (EDOF)

Seamless Continuous Vision

Our new approach to diffractive trifocal technology brings seamless continuous vision to the treatment of presbyopia in cataract surgery. The **Reviol Tri-ED** combines a Trifocal Optic with **Enhanced Depth of Focus** vision. Our innovative zone establishment displays excellent Modular Transfer Function (MTF) values, even between the intermediate zones. The **Reviol Tri-ED** shows superior MTF results in comparative analyses with current trifocal IOLs[1]. The higher the resolution, the happier the patient.





MTF, Modular Transfer Function measures the performance of an optical system based on the amount of contrast that is passed through optic in a determined spatial frequency. The definition of acceptable standards and determination of the threshold is governed by The International Organization for Standardization (ISO) standard 11979-2[2]. MTF test results for the **Reviol Tri-ED** guarantee the patient seamless continuous vision.

References
1- Data on File
2- International Organization for Standardization. Ophthalmic Implants– Intraocular Lenses – Part 2. Optical Properties and Test Methods. Geneva, Switzerland, ISO, 1999 (ISO 11979–2); technical corrigendum 1. 2003

Innovative Diffraction

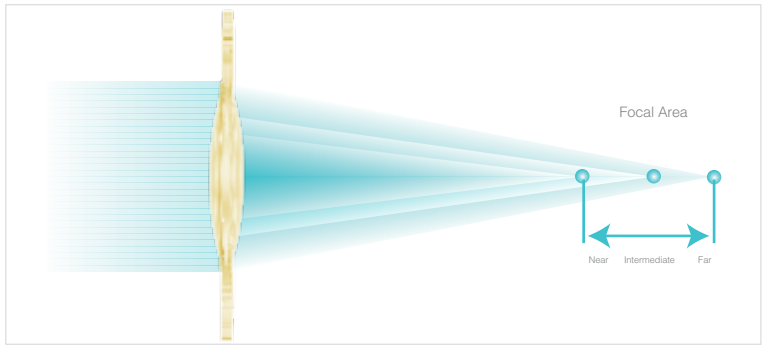
Active Diffractive Optic

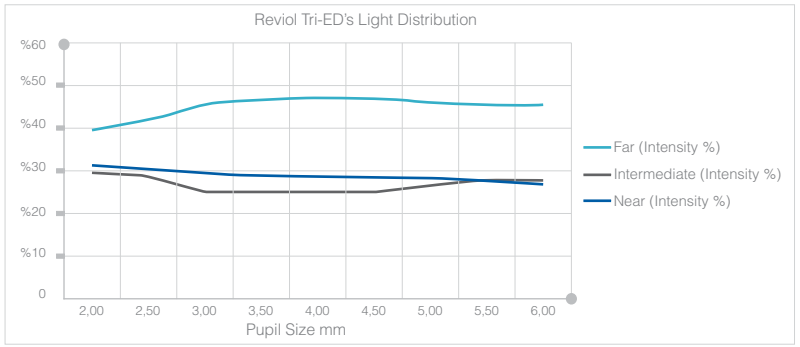
Maximum Light Transfer

The reliable performance of of the Reviol's Active-Diffractive optic has been proven in over forty countries with thousands of implantations. The **Reviol Tri-ED** optic provides maximum light transmission to the retina, with excellent light distribution. Effective light transmittance reaches 89.1% on average.

Optimum Light Distribution

The **Reviol Tri-ED** distributes light by 44% far, 28% intermediate, and 28% near at 6mm aperture pupil size . Balanced light distribution provides increased contrast sensitivity, even in mesopic light conditions.





Diffractive multifocal IOLs separate light from near to distance by creating a phase difference. **The rings of the Reviol Tri-ED** were designed with unique height, width, and interval distance. The distribution of the rings delivers astonishing visual performance.

The success of optical performance in multifocal intraocular lenses relies on determining the optimum diffraction efficiency as a percentage of light in diffraction orders. Unique diffractive zones of the **Reviol Tri-ED** split light through focal paths without the risk of losing light by directing it outside of far and near foci.

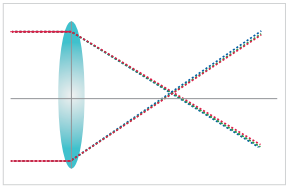
Trifocal IOLs Energy Loss Graphic	
Reviol Tri-ED Semi-Apodized Optic	%11
Trifocal+Bifocal Combined Optic	%14
Trifocal IOL with Convolution	%15

Outstanding Results

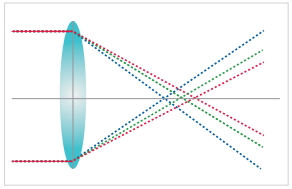
Superior Chromatic Aberration Control

Clear Vision

Measured by an independent laboratory, the Abbe Number of the **Reviol Tri-ED** is 58, one of the highest numbers in the IOL market[3]. This ensures that the **Reviol Tri-ED** has superior chromatic aberration control.



Higher Abbe Number



Lower Abbe Number

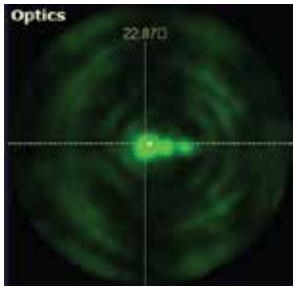
The Importance of Abbe Number

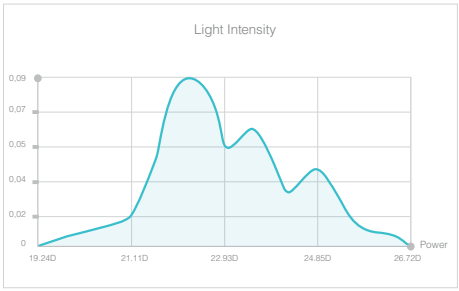
Chromatic aberration is a type of distortion in optical systems caused by different wavelengths of light having different focal points. The higher the Abbe Number, the lower the chromatic aberration.

Semi-Apodization

Appropriate Disparity

The **Reviol Tri-ED** is combined with 3.0D near addition and 1.5D intermediate addition to create a revolutionary three-phase difference. Adequate and appropriate disparity selected in the **Reviol Tri-ED** between near and intermediate focus excludes overlapping problems and creates sharp vision at all distances.





Diffraction efficiency is directly correlated with imaging characteristics and overall image performance of a multifocal optic. Focal overlapping between light centralization in different points plays a negative role in image quality and photic phenomena. The detached focal zones of the **Reviol Tri-ED** optic design have been optimized according to test results of geometrical model.

References
3- Huawei Zhao, Martin A Mainster The effect of chromatic dispersion on pseudophakic optical performance Br J Ophthalmol 2007;91:1225–1229.

All-in-One

Clinical Results

Enhanced Visual Acuity for All Distances

Clinical findings report that the Reviol Tri-ED presents significant improvements in UDVA, UIVA, and UNVA. Superior intermediate visual acuities were observed in the binocular defocus curve when compared with bifocal multifocal IOLs.

Ultra Definition Optic

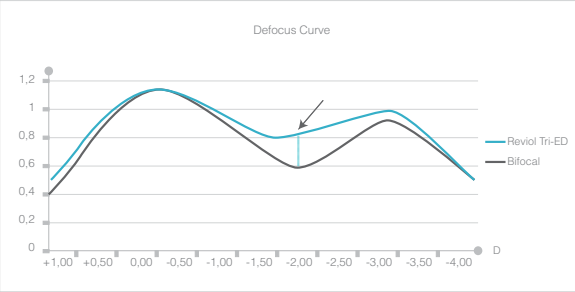
Advanced Vision of Aspheric Design

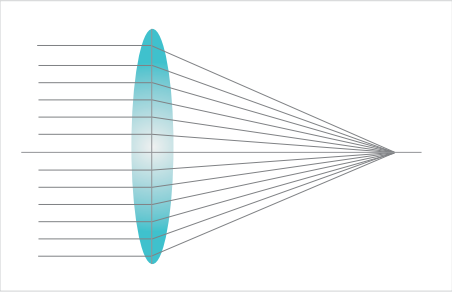
Ultra Definition optic design corrects spherical aberration coming from the cornea. The Reviol Tri-ED IOLs have a slight negative asphericity, that neutralizes part of the positive aberration of the cornea, helping the patient to maintain better depth of focus.[5,6]

360° All Enhanced Square Edge

Real PCO Barrier

The innovative edge design greatly reduces PCO (Posterior Capsule Opacification) risks by creating a geometric and a mechanical barrier against cell proliferation. The edge design allows for production of much thinner lenses than competitors' IOLs with the same equivalent power.





Postoperative refractive outcomes were within the range of -0.75 to +0.25 diopter. No severe glare/halo problems have been reported. All contrast sensitivity results were in the range of 3-12 spatial frequencies measurement, and 92% of surveyed patients reported spectacle independence[4].

Advantages of Ultra Definition Design

- Improved contrasts under mesopic condition
- Preserved depth of focus
- Less sensitive to decentration

Exceptional Design

360° all enhanced square edge and premium material form a dual barrier against PCO after implantation. Recent studies have shown that the square edge on the posterior surface of the optic is the most important IOL-related factor in prevention of PCO formation[7,8].

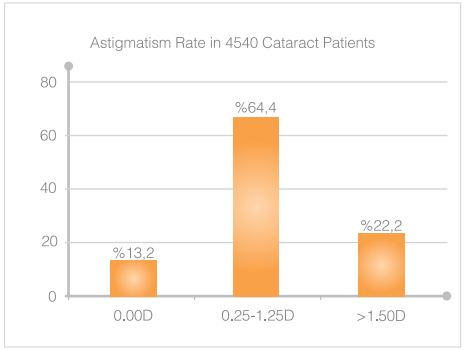
References
4- Data on file
5- Holladay JT, Piers PA, Korayni G, et al. A new intraocular lens design to reduce spherical aberration of pseudophakic eyes. J Refract Surg. 2002, 18 (6):683-691.
6- Belluci R, Morselli S, Piers P. Comparison of wavefront aberrations and optical quality of eyes implanted with five different intraocular lenses. J Refract Surg. 200,20(4):297-306.
7- Can I., Ceran BB., Soyugelen G., Takmaz T. Comparision of clinical outcomes with 2 small-incision diffractive multifocal intraocular lenses. Journal of Cataract & Refractive Surgery 2012 Vol 38 No1.
8- Data on file

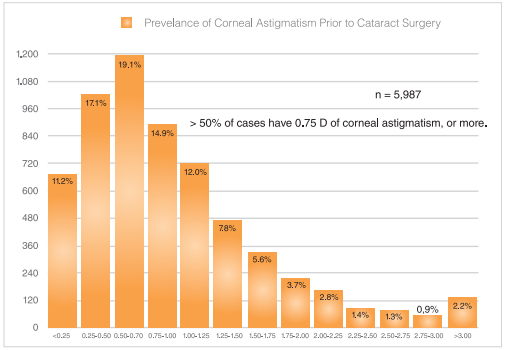
Treat Astigmatism

Prevalence of Astigmatism

More Than Expected

It has been proven that astigmatism is more prevalent than expected among cataract patients. High prevalence of corneal astigmatism has been reported in many research articles. After toric implantation, residual postoperative corneal astigmatism of 0.75D or lower may improve uncorrected visual acuity and reduce symptomatic blur, ghosting of images, and halos[9].





40% of Cataract Patients Exhibit ≥1.0 D Astigmatism

The study published by Dr. Ferrer-Blasco et al. in 2009, consisting of 4540 patients with cataracts, show corneal astigmatism to be prevalent in 87% of the patients[10].

Another clinical study of 5,987 cataract patients performed by Dr. Warren Hill, reported that 52.5% of patients had preoperative astigmatism of more than 0.75D. The figure above shows the percentage of patients at various levels of preoperative astigmatism[11].

Clear Vision for Astigmatic Patients

More patients can become happy after surgery, when clear vision and spectacle-independence help them to live an enjoyable life. The Acriva[UD] Reviol Tri-ED Toric has the largest diopter range in the astigmatism correcting IOL market. It is exclusively Custom Made to perfection. Spherical power ranges from 0.0D to 32.0D and cylinder power range is available up to 10.0D in 0.5D increments.

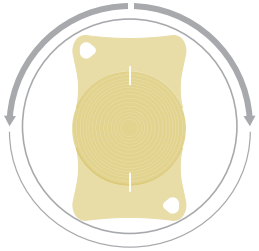
9- Nichamin LD., Astigmatism control. Opthalmol. Clin. North Am. 19, 485–493 (2006).
10- Ferrer-Blasco T. et al. Prevalence of corneal astigmatism before cataract surgery. J Cataract Refract Surg 2009; 35:70-75.
11- Source: Warren Hill Keratometry database, Clinical study of 5,987 US patients.

Proven Platform

Best Solution is Plate Haptic

Minimum SIA, Excellent Stability in MICS Design

Larger incisions cause surgically induced astigmatism and directly affect postoperative refractive outcomes. The **Acriva**^{UD} **Reviol Tri-ED Toric** Plate Haptic is the best choice, since it enables implantation through a sub-2.0-mm incision, minimizes surgically induced astigmatism and stays in the capsular bag without rotation.



Alignment of the **Acriva**^{UD} **Reviol Tri-ED Toric** lens on both sides makes rotation easier during the procedure. Holding on to posterior capsular bag at four points, plate haptic design always delivers excellent rotational stability.

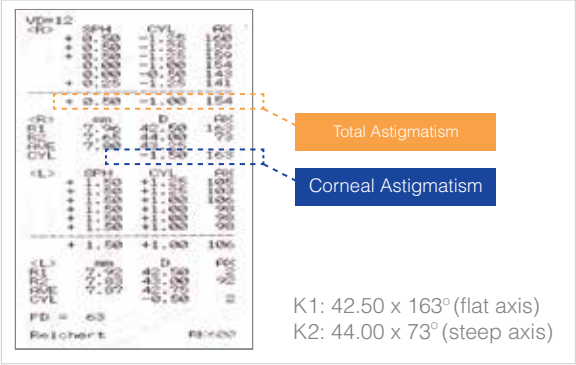
Plan Your Surgery

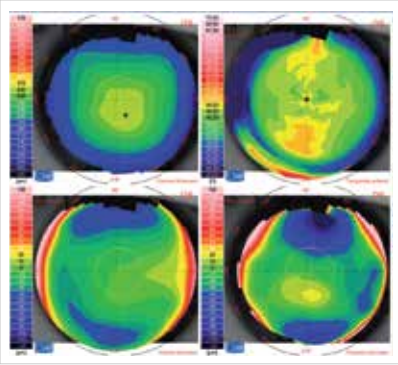
A Preoperative Diagnosis

Amount and Axis of Astigmatism

Successful toric implantation starts with precise examination and evaluation of the amount and axis of corneal astigmatism. Keratometry, biometry, pupillometry, aberrometry, videokeratoscopy, or any other devices are recommended for use in preoperative diagnostic evaluation.

Measurements should be repeated under certain conditions if significant differences are found among different methods, because precise determination of power and axis of astigmatism are essential. The accuracy of axis and power measurement depends substantially on the instruments used for a successful procedure.





Inclusion Criteria

Optimum postoperative results are based on correct patient selection. Recommended inclusion criteria should be followed in a pre-operative toric surgery plan. Total astigmatism of the eye is the value measured in routine clinical practice, which includes both cornea-dependent external astigmatism and neutral lens-dependent internal astigmatism. Only external astigmatism must be taken into consideration in toric IOL calculation since the lens is removed during surgery[12].

Recent studies have shown the importance of taking the posterior corneal surface into consideration when determining total corneal astigmatism and planning astigmatism correction. The posterior cornea acts as a minus lens and it should be evaluated during pre-operative planning[13,14].

12 -Ferreira TB, Marques EF, Rodrigues A, Montes-Mico R. Visual and optical outcomes of a diffractive multifocal toric intraocular lens. J Cataract Refract Surg. 2013;39(7):1029-35.
13- Visser N, Nuijts RM, de Vries NE, Bauer NJ. Visual outcomes and patient satisfaction after cataract surgery with toric multifocal intraocular lens implantation. J Cataract Refract Surg. 2011;37(11):2034-42.
14- Munoz G, Cardoner A, Albarran-Diego C, Ferrer-Blasco T, Belda-Salmeron L. Iris-fixated toric phakic intraocular lens for myopic astigmatism. J Cataract Refract Surg. 2012;38(7):1166-75.

Plan Your Surgery

B Acriva[UD] Easy Toric Calculator

Simple Tool For Toric Surgical Plan

The **Acriva[UD] Easy Toric Calculator** is developed for you to plan your surgery easily and to maximize the benefits of the selected toric lens.

Acriva[UD] Easy Toric Calculator

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ANDROID APP ON Google play

Available on the App Store

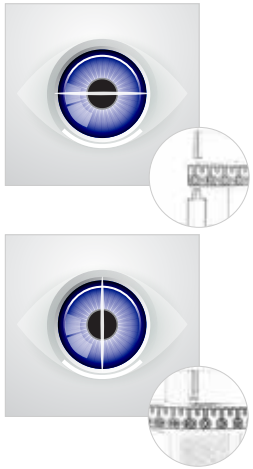
You can access the **Acriva[UD] Easy Toric Calculator** by visiting **www.vsybiotechnology.com** or downloading the application from the App Store or the Play Store.

For more information see **Acriva[UD] Easy Toric Calculator User Guide.**

C Marking the Eye

Preoperative Marking

To limit the cyclotorsional effect that would expose the eye when switching from vertical to horizontal position, performing preoperative reference marking while the patient is seated is recommended. Mark the reference axis, ideally with the help of a slit lamp and with a marking pen or ink pad. The slit lamp may also be used for targeting the axis by changing the lamp position to the desired angle.

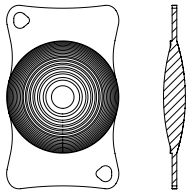
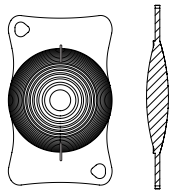


Intraoperative Marking

After changing patient's position from sitting to supine, mark the targeted axis with a fixation ring such as Mendez's with the guide as reference point. A pendulum marker is another option in which gravity enables the marking. Accurate axis marking is crucial in toric implantation as any misalignment could result in a lack of cylindrical correction.

Acriva® Reviol Tri-ED
Trifocal+Enhanced Depth of Focus

Acriva® Reviol Tri-ED toric
Trifocal Toric+Enhanced Depth of Focus

	Acriva® Reviol Tri-ED	Acriva® Reviol Tri-ED toric
General	Trifocal + EDOF Toric, Foldable, Single Piece, Aspheric, Achromatic, Hydrophobic Surface, UV, Violet, and Blue Filter	
Optic Size	6.00 mm	
Optic Design	Active-Diffractive Trifocal+EDOF	
Haptic Size	11.00 mm	
Haptic Design	Plate Haptic	
Haptic Angle	0°	
Aspheric Value	0.165 µm (Mild Negative Correction)	
Abbe Number	58	
Light Transmission	89.1%	
Light Distribution	Photopic Condition 40% Far - 30% Intermediate - 30% Near Mesopic Condition 44% Far - 28% Intermediate - 28% Near	
Square Edge	360° All Enhanced Square Edge	
Acustic (Nominal) A Constant	118.0	
Optical A Constants	 SRK-II : 119.0 SRK-T : 118.7 ACD : 5.30 Haigis a0 : 1.15 Haigis a1 : 0.40 Haigis a2 : 0.10 Hoffer Q pACD : 5.32 Sf : 1.58	SRK-II : 119.0 SRK-T : 118.7 ACD : 5.28 Haigis a0 : 1.15 Haigis a1 : 0.40 Haigis a2 : 0.10 Hoffer Q pACD : 5.32 Sf : 1.58 
Diopter Power Range	From 0.0D to +32.00D (0.50D increments)	Spheric: From 0.0D to +32.00D (0.50D increments) Cylindric: From +1.00D to +10.00D (0.50D increments)
Refractive Index Wet	20°C /35°C 1.462 / 1.462 ± 0.002	
Recommended Injector	Acrijet Green 1.8 (Up to 25.0D) Acrijet Green 2.0 (Up to 28.0D) Acrijet Green 2.2 (Up to 30.0D)	Acrijet Green 1.8 (Up to Sph 25.0D Cyl 5.0D) Acrijet Green 2.0 (Up to Sph 28.0D Cyl 5.0D) Acrijet Green 2.2 (Up to Sph 30.0D Cyl 5.0D)


Check features!

Acriva[UD] Reviol Tri-ED

Tri-ED 611

Acriva[UD] Reviol Tri-ED Toric

Tri-ED T 611

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