For Cataract and Refractive Lens Exchange (RLE) patients

THE WORLD’S FIRST AND ONLY SINUSOIDAL TRIFOCAL IOL

Rely on the smooth surface

Patented Technology
WHAT IS SINUSOIDAL VISION TECHNOLOGY (SVT)?

Sinusoidal Vision Technology is inspired by the sinusoidal pattern seen in nature. We created trifocality with the help of Sinusoidal Vision Technology that displays Sine wave like surface profile. This revolutionary patented technology is designed to obtain the best optical performance from an IOL. More light transmission, optimum light distribution, less scattered light, less halo & glare. Trifocality combined with Enhanced Depth of Focus (EDOF), real continuous vision…

We Are Inspired by the Nature
GET RID OF THE SHARP EDGES

Sharp edges and pointy peaks of the overlapping pattern on the traditional trifocal IOLs are the main causes of positive dysphotopsia. Acriva® Trinova has smoothly varying surface profile that helps to reduce halos and glare due to reduced scattered light.

Acriva® Trinova, Sinusoidal Trifocal IOL
Surface Profile, Unique Sinusoidal Pattern

Traditional Trifocal IOL
Surface Profile Overlapping Pattern with Sharp Edges
MAXIMUM LIGHT TRANSMISSION TO RETINA

AcrivaUD Trinova provides the highest light transmission to retina by 92% among all available trifocal IOLs. The crystalline lens of a 30 year-old healthy individual has 95% light transmission and AcrivaUD Trinova has the closest light transmission to this rate.¹

It is known that overlapping diffractive pattern trifocal IOLs cause significant light loss. Each one percentage of light loss affects patient’s overall visual performance exponentially. AcrivaUD Trinova ensures maximum light transmission, thanks to its stepless diffractive zones and thus improves contrast sensitivity.

<table>
<thead>
<tr>
<th>IOLs</th>
<th>Light Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>AcrivaUD Trinova (+1.50D/+3.00D)</td>
<td>92%²</td>
</tr>
<tr>
<td>IOL A (+1.75D/+3.50D)</td>
<td>86%³</td>
</tr>
<tr>
<td>IOL B (+1.66D/+3.33D)</td>
<td>85.7%⁴</td>
</tr>
<tr>
<td>IOL C (+2.17D/+3.25D)</td>
<td>88%⁵</td>
</tr>
<tr>
<td>Natural Crystalline Lens</td>
<td>95%¹</td>
</tr>
</tbody>
</table>

Table 1

SUPERIOR OPTICAL PERFORMANCE

MTF (Modulation transfer function) is a bench measurement of the ability of an optical system to transfer contrast from the object to the image. The criteria of a “Good” optical system has been set by the International Organization for Standardization (ISO 11979-2).

The higher the MTF value, the more contrast is transferred to the image, resulting in higher image contrast. As it is seen in Figure 1 below, AcrivaUD Trinova shows greater performance in total focus area from far to near.⁵⁷

Figure 1: Comparison of MTF Values⁷
COMFORTABLE READING DISTANCES

+3.00D near addition and +1.50D intermediate addition of AcrivaUD Trinova is precisely designed with life quality of the patient in mind. Up to 80 cm reading distance will cover all daily requirements in near and intermediate vision. AcrivaUD Trinova has the widest range of vision with 42 cm. Comparison table can be seen below.\textsuperscript{8,9,10}

<table>
<thead>
<tr>
<th>IOLs</th>
<th>Near Addition</th>
<th>Theoretical Reading Distance</th>
<th>Intermediate Addition</th>
<th>Theoretical Reading Distance</th>
<th>Range of Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>AcrivaUD Trinova</td>
<td>+3.00D</td>
<td>38 cm</td>
<td>+1.50D</td>
<td>80 cm</td>
<td>42 cm</td>
</tr>
<tr>
<td>IOL A:</td>
<td>+3.50D</td>
<td>34 cm</td>
<td>+1.75D</td>
<td>68 cm</td>
<td>34 cm</td>
</tr>
<tr>
<td>IOL B:</td>
<td>+3.33D</td>
<td>36 cm</td>
<td>+1.66D</td>
<td>72 cm</td>
<td>36 cm</td>
</tr>
<tr>
<td>IOL C:</td>
<td>+3.25D</td>
<td>35 cm</td>
<td>+2.17D</td>
<td>55 cm</td>
<td>20 cm</td>
</tr>
</tbody>
</table>

Table 2

BALANCED LIGHT DISTRIBUTION

Light distribution plays a big role in obtaining seamless, continuous vision. Conventional trifocal IOL designs distribute light energy in a ratio such that zones of discontinuity may be noticeable to patients. They might fail to distribute the light to the focal points evenly. Usually, most of the light contributes to far vision leading to inadequate near and intermediate vision performances, especially in mesopic conditions.

AcrivaUD Trinova incorporates a unique sinusoidal surface profile that doesn’t exhibit any sharp edges, providing a more continuous light-energy distribution. This leads to remarkable spectacle-free visual competencies not only in photopic, but also in mesopic conditions.\textsuperscript{8}

Light distribution in photopic condition:
41% Far, 30% Intermediate, and 29% Near

Light distribution in mesopic condition:
45% Far, 25% Intermediate, and 30% Near

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{Light_Distribution.png}
\caption{Light Distribution}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.3\textwidth]{IOL_A.png}
\caption{IOL A\textsuperscript{+} (+1.75D/+3.50D)}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.3\textwidth]{IOL_B.png}
\caption{IOL B\textsuperscript{+} (+1.66D/+3.33D)}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.3\textwidth]{IOL_C.png}
\caption{IOL C\textsuperscript{+} (+2.17D/+3.25D)}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{Aperture_Distribution.png}
\caption{Aperture Distribution}
\end{figure}

References:
10. Netlin, Alain Rodriguez. Updates in intraocular lenses Dr. Alain P. Paton Lecture at Ovodol, EMPO 2018
**USAF RESOLUTION TARGET TEST**

A resolution test pattern is, as the name implies, a tool for measuring the resolving power of an optical system. It consists of reference line patterns with well-defined thicknesses and spacings. The test helps demonstrating the performance of a lens in terms of its resolution in photopic and mesopic conditions.

<table>
<thead>
<tr>
<th>Sinusoidal Pattern (New Generation)</th>
<th>Photopic Conditions</th>
<th>Mesopic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acriva&lt;sup&gt;10&lt;/sup&gt; Trinova (+1.50D/+3.00D)</td>
<td><img src="image1" alt="Image 1" /> <img src="image2" alt="Image 2" /> <img src="image3" alt="Image 3" /></td>
<td><img src="image4" alt="Image 4" /> <img src="image5" alt="Image 5" /> <img src="image6" alt="Image 6" /></td>
</tr>
</tbody>
</table>

| IOL A (+1.75D/+3.50D) | ![Image 7](image7) ![Image 8](image8) ![Image 9](image9) | ![Image 10](image10) ![Image 11](image11) ![Image 12](image12) |

| Overlapping Diffractive Pattern (Traditional) | | |
| IOL B (+1.66D/+3.33D) | ![Image 13](image13) ![Image 14](image14) ![Image 15](image15) | ![Image 16](image16) ![Image 17](image17) ![Image 18](image18) |

| IOL C (+2.17D/+3.25D) | ![Image 19](image19) ![Image 20](image20) ![Image 21](image21) | ![Image 22](image22) ![Image 23](image23) ![Image 24](image24) |

*Figure 3*
TOLERANCE TO DECENTRATION AND LARGE ANGLE KAPPA

Acriva<sup>UD</sup> Trinova has the highest tolerance to decentration and angle Kappa with its central diameter of 1.4 mm.

Angle Kappa May Play Important Role For A Successful Premium IOL Implantation

Studies suggest that the traditional multifocal IOLs are unacceptable for use, if the angle kappa is greater than half of the diameter of the central optical zone of the respective lens.<sup>13</sup>

If the lens is significantly decentered because of failure to accommodate for angle kappa, then central light rays may miss the central optical zone and pass through one of the multifocal rings, leading to glare.<sup>13</sup> In this case, the size of the central ring plays an important role. An IOL with a wide central ring may tolerate large angle kappa much more than an IOL with a small central ring.

### Angle Kappa

![Diagram showing the relationship between fixation target, pupillary axis, and visual axis with Acriva<sup>UD</sup> Trinova vs. Traditional Trifocal IOL](image)

<table>
<thead>
<tr>
<th>Acriva&lt;sup&gt;UD&lt;/sup&gt; Trinova</th>
<th>Central Ring Diameter</th>
<th>Tolerance to Angle Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOL A</td>
<td>1.0 mm</td>
<td>0.5 mm</td>
</tr>
<tr>
<td>IOL B</td>
<td>1.04 mm</td>
<td>0.52 mm</td>
</tr>
<tr>
<td>IOL C</td>
<td>1.164 mm</td>
<td>0.58 mm</td>
</tr>
</tbody>
</table>

Table 3

References:
ASTIGMATISM CORRECTION

Sinusoidal Trifocal Toric IOL

- Perfect Clinical Outcomes in Astigmatism Correction
- Excellent Post-Op Rotational Stability
- Alignment Possibility in Both Directions
- Wide Diopter Range
  Sph 0.0 D - 32.0 D (0.5 D increments)
  Cyl 1.0 D - 10.0 D (0.5 D increments)

Minimum SIA, MICS Design

Larger incision causes higher surgically induced astigmatism and directly affects post-operative refractive outcomes. Since Acriva UD Trinova Toric with plate haptic design enables implantation through a sub-2.0-mm incision, it minimizes surgically induced astigmatism and stays in the capsular bag without rotation.

Excellent Rotational Stability, Easy Alignment

The alignment of Acriva UD Trinova Toric IOL is easier, as it can be rotated in both directions during the operation. Since the whole haptic surface is in contact with the capsular bag, plate haptic design always delivers excellent rotational stability.
Acriva<sup>UD</sup> Easy Toric Calculator

Simple Tool For Toric Surgical Plan

The Acriva<sup>UD</sup> Easy Toric Calculator is developed for you to plan your surgery easily and to maximize the benefits of the selected toric lens.

How to Use Toric Calculator?

1. **Input Data & Select IOL Model**
   - Choose the appropriate toric IOL model (Toric or Multifocal Toric).
   - Fill in the surgeon information and patient demographics.

2. **Enter Values For Calculation and Press “Next” Button**
   - K Values for steep and flat axis
   - IOL Spherical Power
   - Surgically Induced Astigmatism
   - Incision Location

3. **See Calculator Results and Axis of Placement Map**
   - Equivalent Spherical IOL
   - Cylinder Power (Corneal Plane)
   - Cylinder Power (IOL Plane)
   - Axis of Alignment
   - Axis of Placement Map

4. **Download and Print**
   - You can download and print your calculation results.

You can access the Acriva<sup>UD</sup> Easy Toric Calculator by visiting [www.vsybiotechnology.com](http://www.vsybiotechnology.com). Download the application available for iPhone and iPad from the App Store or from the Google Play Store for all Android devices.

Scan the QR code to access Acriva<sup>UD</sup> Easy Toric Calculator

[www.easytoricccalculator.com](http://www.easytoricccalculator.com)
<table>
<thead>
<tr>
<th><strong>General</strong></th>
<th><strong>Acriva\textsuperscript{UD} Trinova</strong></th>
<th><strong>Acriva\textsuperscript{UD} Trinova Toric</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Optic Size</strong></td>
<td>6.00 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Optic Design</strong></td>
<td>Trifocal SVT (Patented Technology)</td>
<td>Trifocal Toric SVT (Patented Technology)</td>
</tr>
<tr>
<td><strong>Haptic Size</strong></td>
<td>11.00 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Haptic Design</strong></td>
<td>Plate Haptic (suitable for MICS)</td>
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<tr>
<td><strong>Haptic Angle</strong></td>
<td>0\degree</td>
<td></td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Hydrophobic Surface, BB (Blue Balance), Natural Chromophore, Dynamic Photofiltration</td>
<td></td>
</tr>
<tr>
<td><strong>Aspheric Value</strong></td>
<td>Ultra Definition Mild Negative Correction</td>
<td></td>
</tr>
<tr>
<td><strong>Abbe Number</strong></td>
<td>58</td>
<td></td>
</tr>
<tr>
<td><strong>Light Transmission</strong></td>
<td>92.0 %</td>
<td></td>
</tr>
<tr>
<td><strong>Light Distribution</strong></td>
<td>Photopic Conditions: 41% far - 30% intermediate - 29% near</td>
<td>Mesopic Conditions: 45% far - 25% intermediate - 30% near</td>
</tr>
<tr>
<td><strong>Square Edge</strong></td>
<td>360\degree All Enhanced Square Edge</td>
<td></td>
</tr>
<tr>
<td><strong>Refractive Index Wet</strong></td>
<td>20\degree / 35\degree 1.462/1.462 ± 0.002</td>
<td></td>
</tr>
<tr>
<td><strong>Acoustic A Constant</strong></td>
<td>118.0</td>
<td></td>
</tr>
<tr>
<td><strong>Optical A Constant</strong></td>
<td>SRK- II: 118.0</td>
<td>SRK-T: 117.9</td>
</tr>
<tr>
<td></td>
<td>Haigis a0, a1, a2: 0.58, 0.4, 0.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hoffer Q pACD: 4.82</td>
<td></td>
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<tr>
<td></td>
<td>Holladay sf: 1.04</td>
<td></td>
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<tr>
<td></td>
<td>Barrett Universal II LF: 1.31</td>
<td></td>
</tr>
<tr>
<td><strong>Dioptric Power Range</strong></td>
<td>sph 0.0 D to +32.0 D (0.5 D increments)</td>
<td>sph 0.0 D to +32.0 D (0.5 D increments)</td>
</tr>
<tr>
<td></td>
<td>cyl +1.0 D to +10.0 D (0.5 D increments)</td>
<td>cyl 1.0 D to +10.0 D (0.5 D increments)</td>
</tr>
<tr>
<td><strong>Recommended Injector</strong></td>
<td>Acrijet Green 1.8 (up to sph 25.0 D)</td>
<td>Acrijet Green 1.8 (up to sph 25.0 D, cyl 5.0 D)</td>
</tr>
<tr>
<td></td>
<td>Acrijet Green 2.0 (up to sph 28.0 D)</td>
<td>Acrijet Green 2.0 (up to sph 28.0 D, cyl 5.0 D)</td>
</tr>
<tr>
<td></td>
<td>Acrijet Green 2.2 (up to sph 30.0 D)</td>
<td>Acrijet Green 2.2 (up to sph 30.0 D, cyl 5.0 D)</td>
</tr>
</tbody>
</table>
Halo and Glare?
Not a problem anymore!
THE WORLD’S FIRST AND ONLY SINUSOIDAL TRIFOCAL IOL

Rely on the smooth surface

**Acriva**
Sinusoidal Trifocal IOL
Surface Profile
Unique Sinusoidal Pattern

**GET RID OF SHARP EDGES!**

Halo/Glare is not a problem anymore!

Sinusoidal Vision Technology (SVT) is a unique patented technology for producing a trifocal IOL optical surface that does not exhibit any sharp edges. The lens optic has smoothly varying surface profile that helps to reduce halo/glare due to the reduced scattered light.

For **Cataract** and **Refractive Lens Exchange** (RLE) patients