



Premium Cataract Surgery With Victus PhemtoLaser & LuxSmart IOL



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VICTUS (Bausch & Lomb) femtosecond Laser Platform

VICTUS = Versatility

Cataract Surgery

- Corneal Incisions
- Capsulotomy
- Fragmentation
- Arcuate Incisions



Refractive Surgery

- LASIK Flap
- Penetrating keratoplasty
- Lamellar Keratoplasty
- DMEK
- Tunnels for ICRS* (Intracorneal ring segments)

VICTUS Laser Application in Cataract Surgery

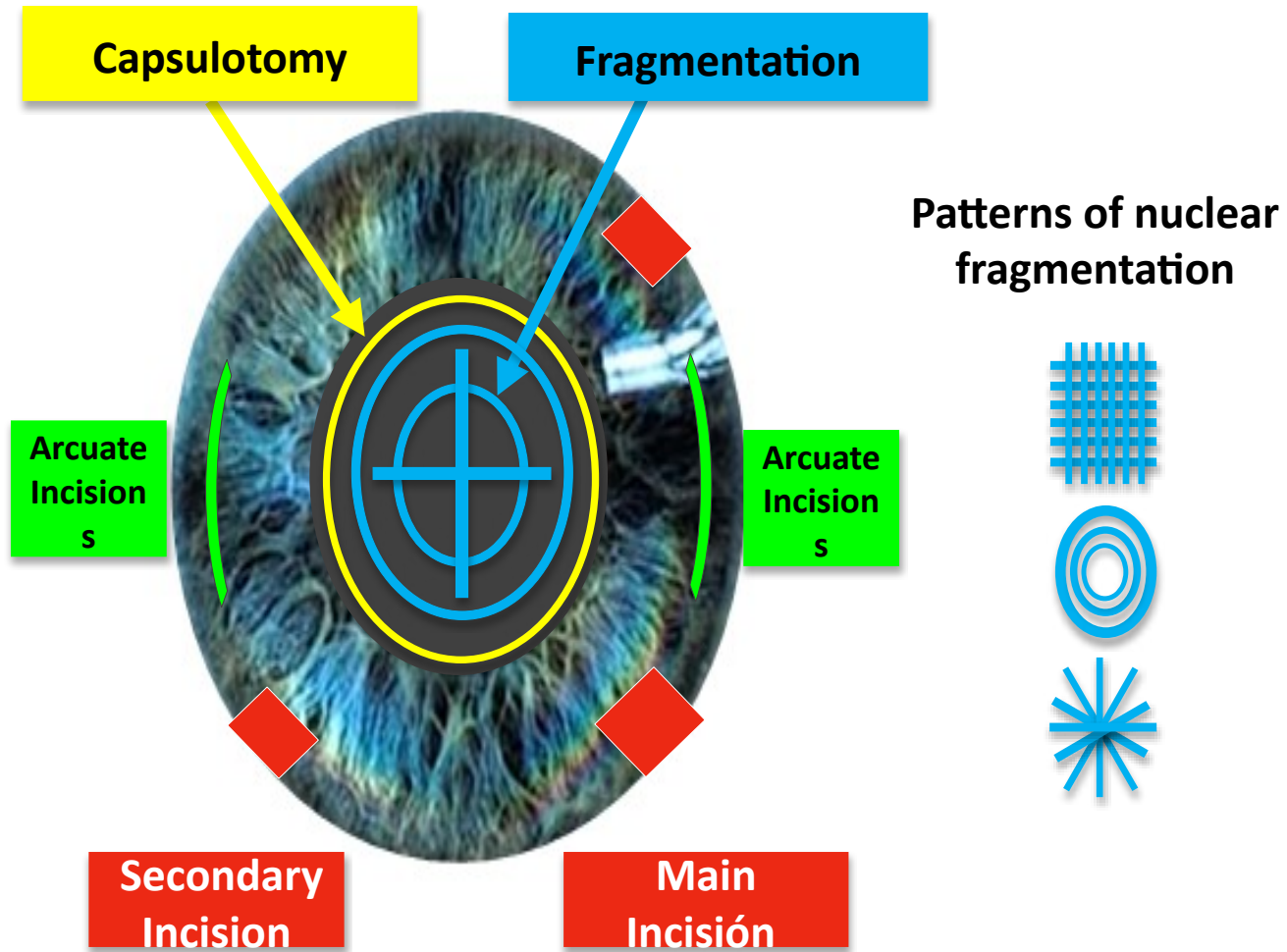


Image guided by 2S-OCT

2S-OCT (Swept Source)

Designed for:

- High contrast
- New experience of visualization with high velocity of response
- Sincronized with AIMS - Advanced Identification Management System
- Planification of corneal procedures
- Real time image during docking & the full treatment for all procedures (cornea & cataract)



SOFT DOCKING: Capsul or hexis & Fragmentation

Automatic Detection of the pupil

- The capsul or hexis is automatically centered in the pupil
- **Possibility to manually mark the pupil or limbus**
- Option of centering the capsulotomy in the apex of the crystalline lens

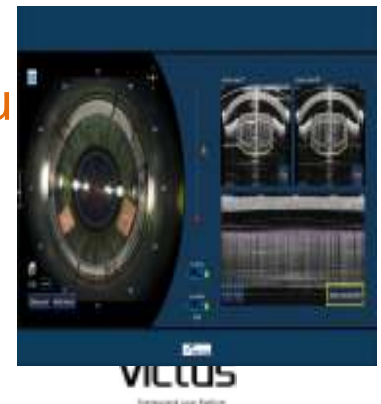
Automatic Detection of the Crystalline

- Possibility to mark the anterior & posterior fase of the crystalline lens at axis 0° - 180° y 90° - 270°



Programming Treatment Zone for Capsul

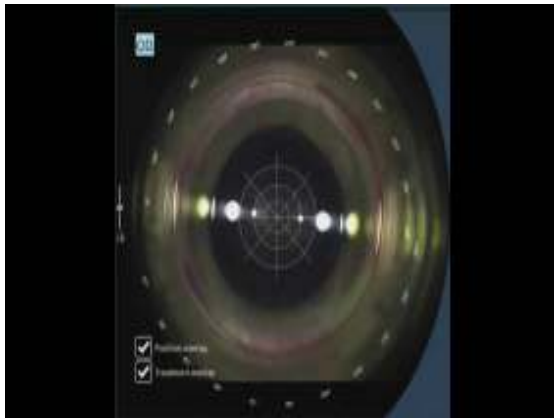
- Possibility to mark the treatment zone de for capsulotomy



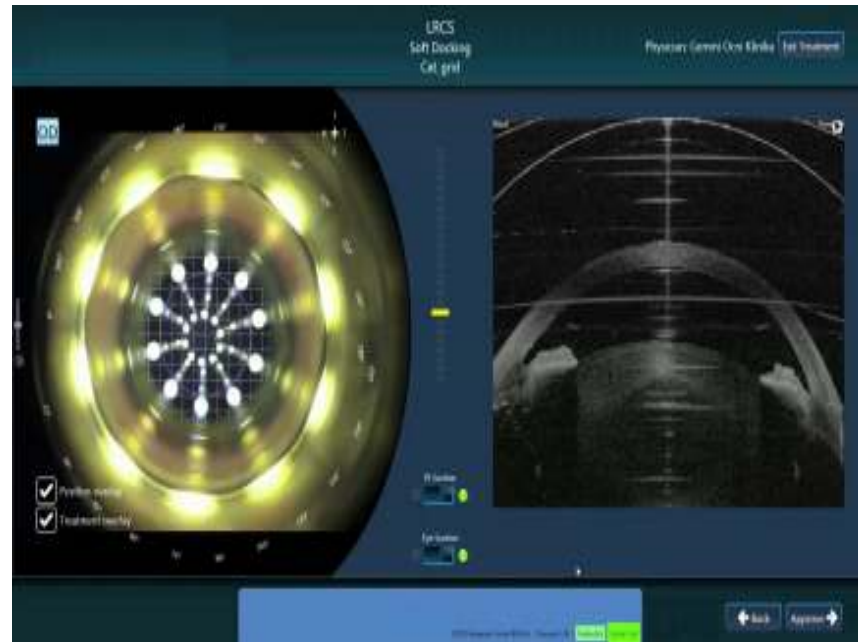
Patterns of Fragmentation

The aim is to facilitate the procedure of phacoemulsification & reduce ultrasound application

Spider



Grid pattern



Nuclear fragmentation Patterns

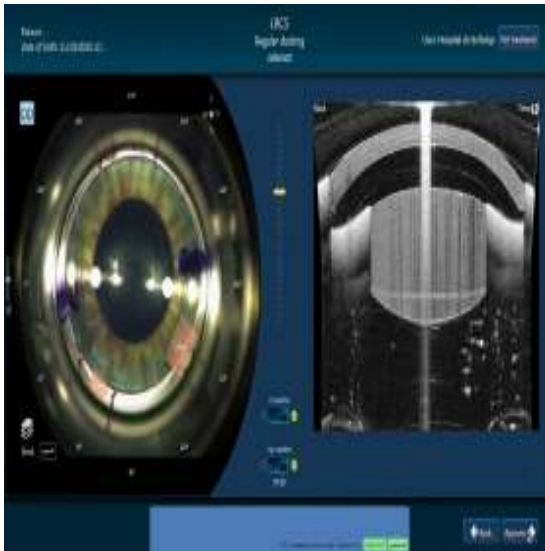


HARD DOCKING Incisions

Open suction Ring and repeat the Docking

Corneal Incisions

- 1- Compensate cyclotorsion
- 2- Locate incisions in the desired spot



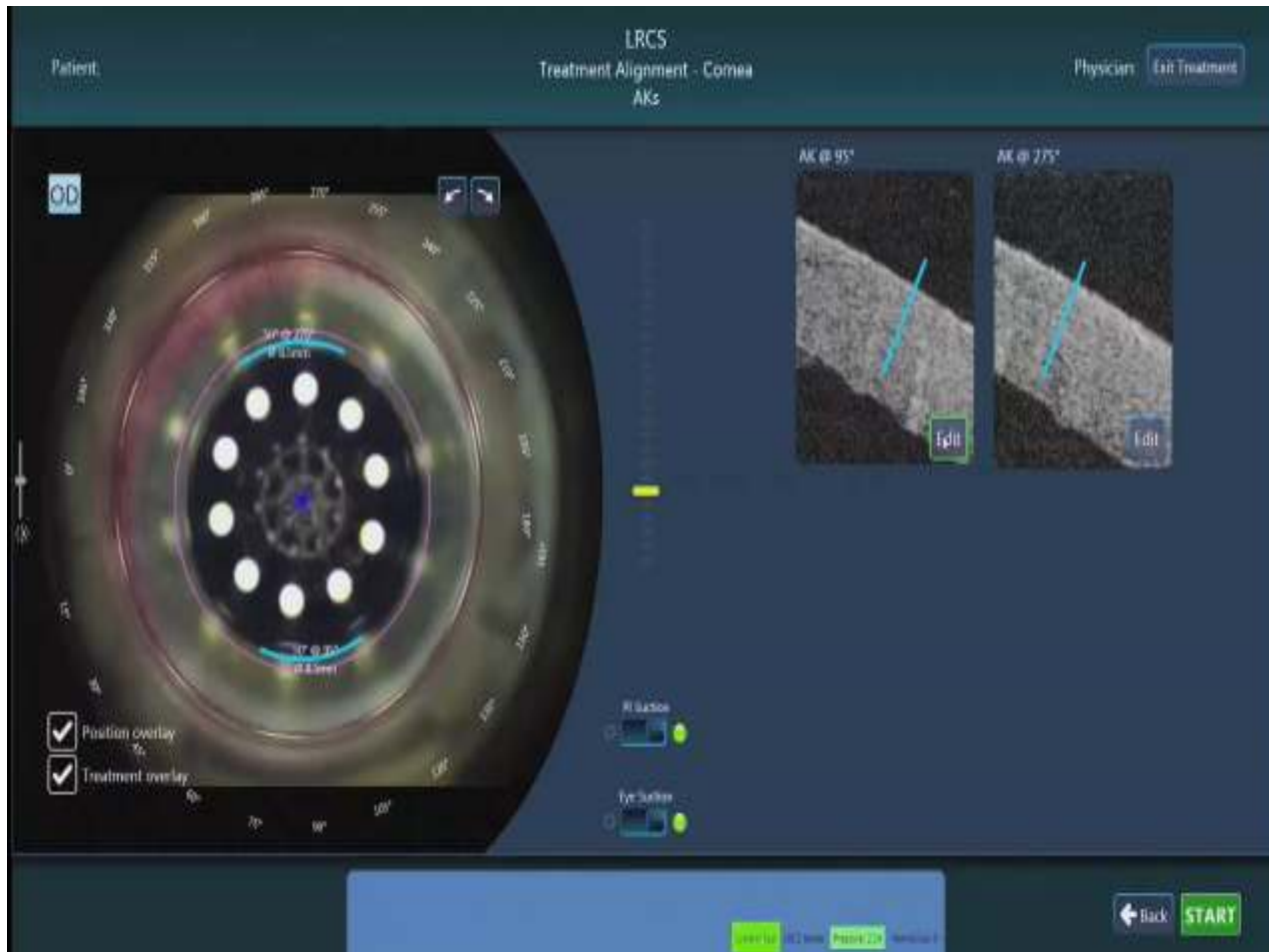
Arcuate Incisions

- 1- locate arcuate incisions in the desired spot
- 2- Compensate cyclotorsion
- 3- Mark the exact pachymetry with the help of the OCT
- 4- Relocate the corneal incisions in the exact spot



VICTUS Laser Application in Arcuate Incisions

- 2S-OCT (Swept Source) allows us to modify the depth of the incisions during surgery



VICTUS Corneal Incisions

- Up to 3 incisions could be done
- Each incision could be done in 3 different planes
- Each incision could be adjusted independently



Fuente: Manual de usuario Victus™ Femtosecond Laser Platform, SW V3.3 SP02 Versión 6. UM-100010770 ES; SKU: 70005784TPV

By courtesy of Dr. Stodulka

LuxSmart™ The New EDOF IOL

launching soon in Egypt



**PURE REFRACTIVE OPTICS
TECHNOLOGY**



LuxSmart™ The New EDOF IOL

2476

Y. Bernard et al / Vision Research 51 (2011) 2471–2477

Optimizing the subjective depth-of-focus with combinations of fourth- and sixth-order spherical aberration

Yolaine Bernard^{a,b}, Noémie Lopez-Gil^a, Richard Lagas^{a,b,c}

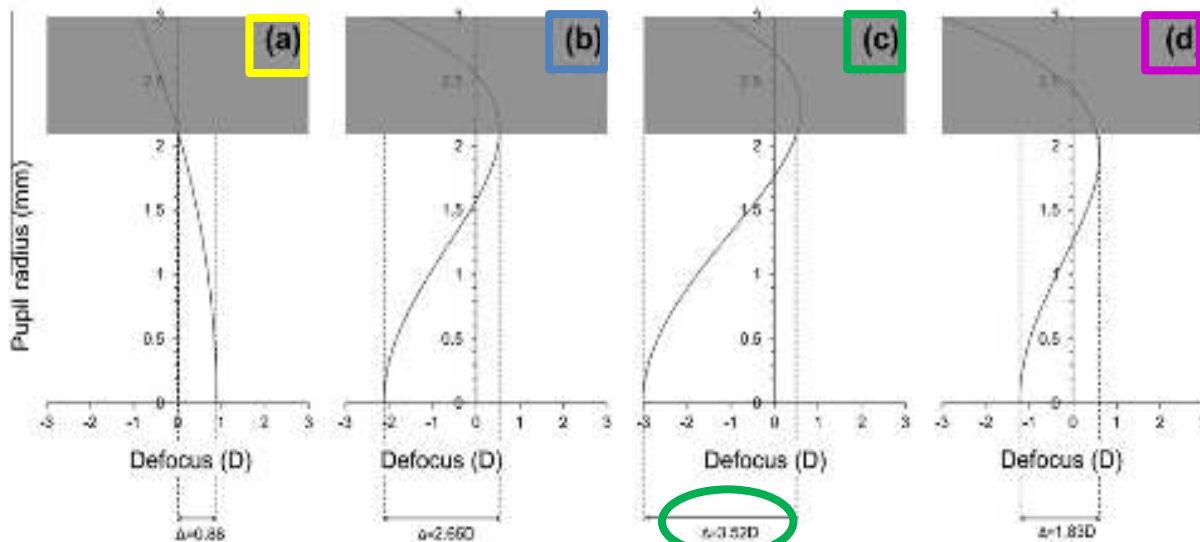


Fig. 5. Examples of the evolution of the vergence with the pupil size, depending on the induced aberrations: (a) 0.3 μm of SA4, (b) 0.3 μm of SA6, (c) combination of 0.3 μm of SA4 and -0.3 μm of SA6, and (d) combination of 0.3 μm of SA4 and 0.3 μm of SA6. Grey areas represent a pupil larger than 2.1 mm as an example to represent the larger change of defocus measured for this pupil radius.

SA 4th
only

SA 6th
only

SA 4th SA 6th
Opposite signs

Largest change of defocus

SA 4th SA 6th
Same signs

In **OPTICAL MODELING** the vergence of the optic (Δ) measured on an optical curve was well correlated to the Subjective Depth of Field obtained for same pupil size.

Bernard, 2011

Optimizing the subjective Depth-of-focus with combinations of fourth- and sixth-order spherical aberration. Bernard, 2011

Change In The Depth Of Focus In Relation To The Induced Aberration

Spherical Aberration
only 4th order



Increases the depth of field **30 %**

Spherical Aberration
only 6th order



Increases the depth of field **45 %**

Spherical Aberration
4th y 6th
Opposite Signs



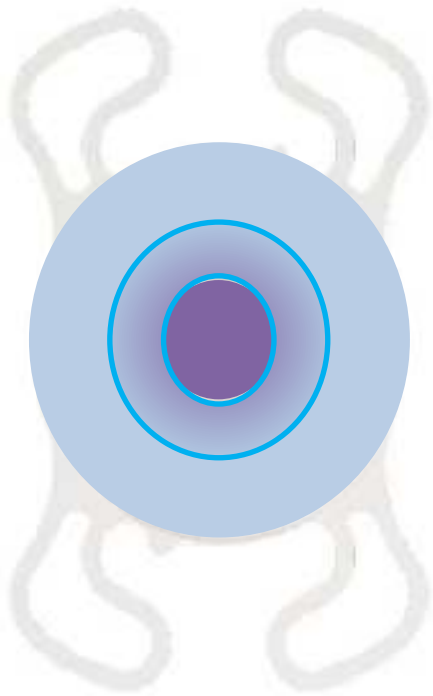
Increases the depth of field **63 %**

Spherical Aberration
4th y 6th
Same Sign



Increases the depth of field **24 %**

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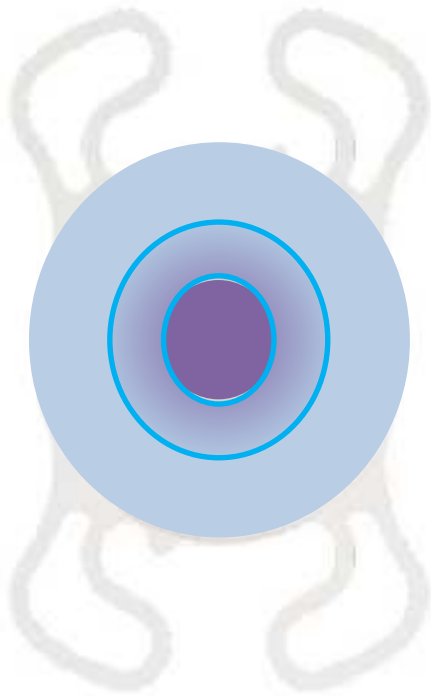


**PURE REFRACTIVE OPTICS
(PRO™ Technology)**

EDOF CENTER

2 mm of EDOF center with increased depth of focus created by the combination of 4th and 6th order spherical aberration of opposite signs

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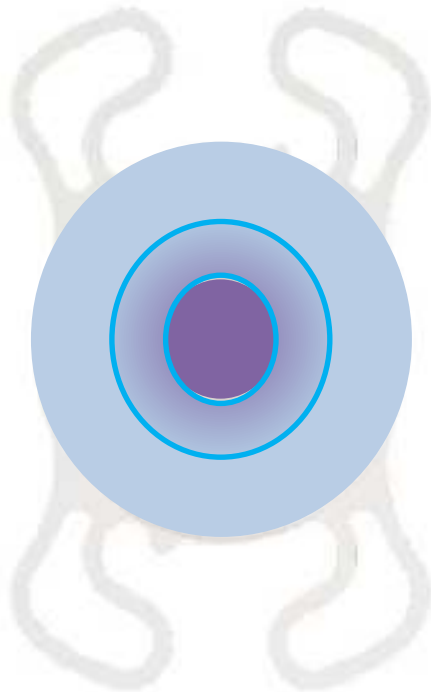


PURE REFRACTIVE OPTICS

PATENTED TRANSITION ZONE

- Transition zone designed to smoothly decrease the optic vergence from the center to the periphery.
- Transition designed to take part of the 4th and 6th spherical aberration orders management.
- Transition designed to control the trajectory of light rays to ensure no light is outside range of vision (no light loss).

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**PURE
REFRACTIVE OPTICS**

MONOFOCAL PERIPHERY

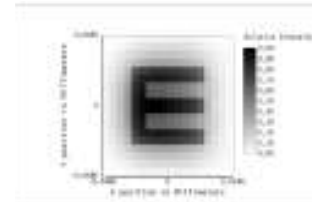
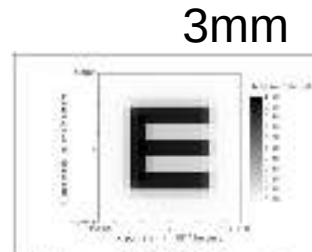
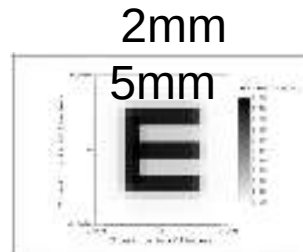
Monofocal aspheric surface

Aberration free

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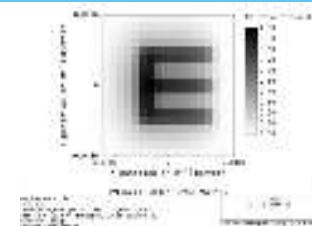
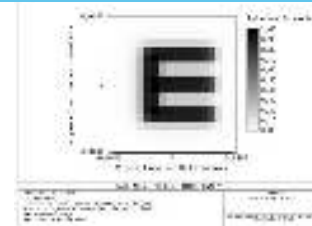
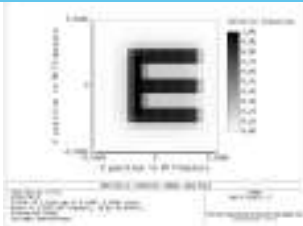
OPTICAL MODELING - RETINAL IMAGES

Centered

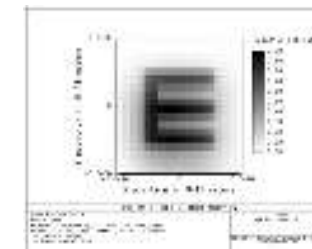
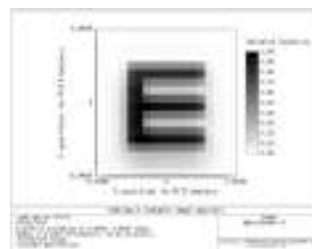
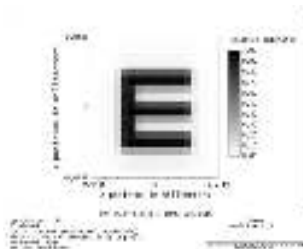


OPTIC RESISTANT TO TILT AND DECENTRATION

5° tilt

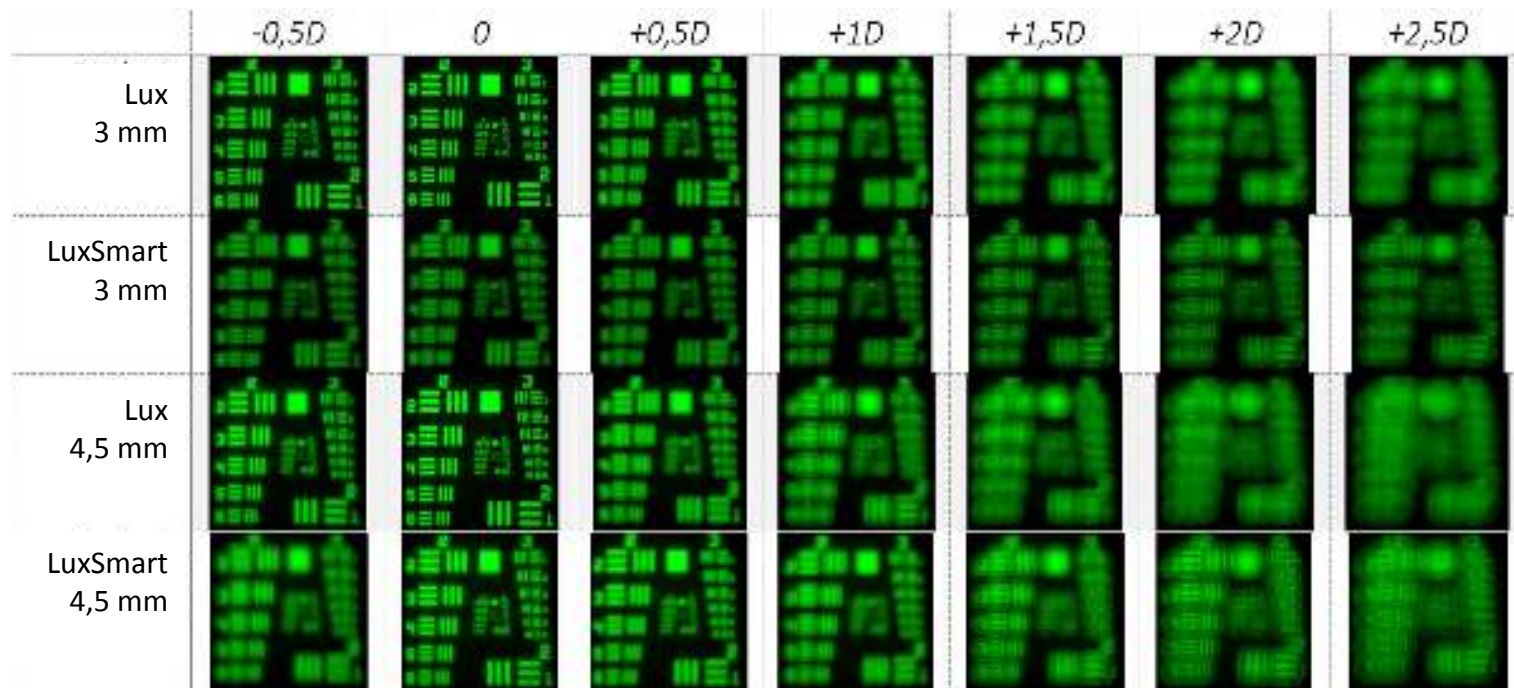


**0.4 mm
decentration**



LuxSmart™ The New EDOF IOL

USAF Images



The quality of the image affected by blurring:

LUXsmart - Greater depth of field - Sharper images (some details can still be distinguished down to 2D, even 3D)

LuxSmart™ The New EDOF IOL

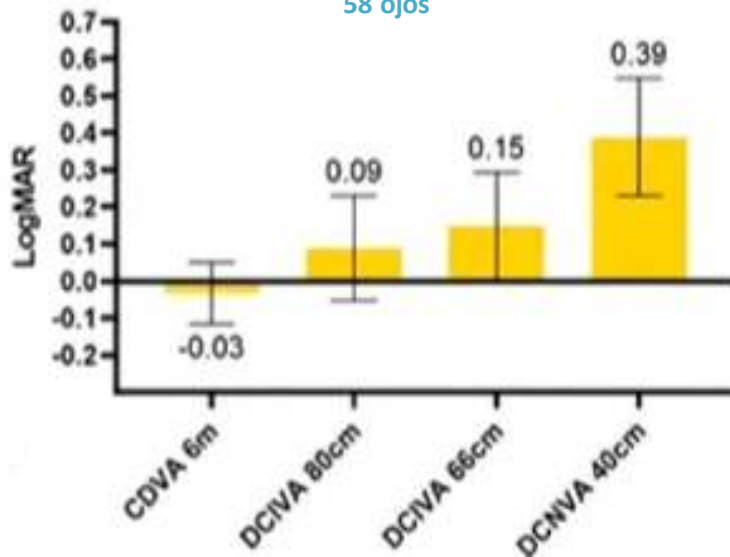
Lens characteristics	
Material	Hydrophobic, Clear or violet light filtering
Refractive index	1,54 at 35°C
Overall design	One-piece, 4 point-fixation, C-Edge+ ≤ 5microns 360° square edge
Optical design	Biconvex, Aspheric with extended depth of focus
Angulation	0°
Optic diameter	6 mm
Overall diameter	11 mm
Power Range	0.00 to +34.00D - 1.00 D steps from 0.00 D to +10.00 D - 0.50 D steps from +10.00 D to +34.00 D
Incision size	≥ 2.2 mm
Platform	4 point-fixation haptics
Water content	< 0.5 %



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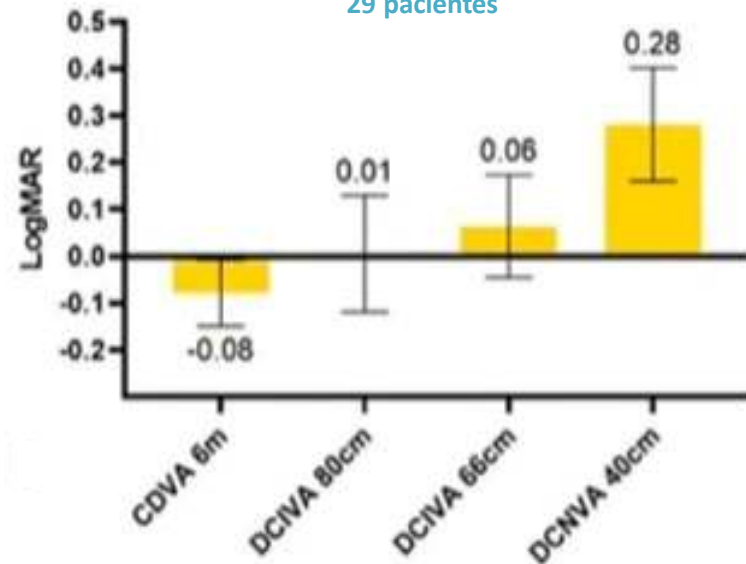
MONOCULAR VA

58 ojos



BINOCULAR VA

29 pacientes

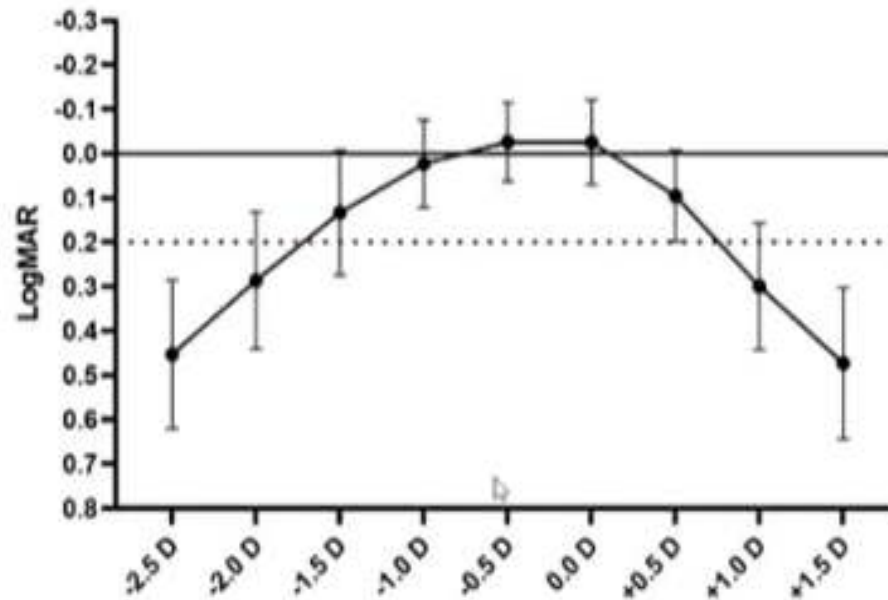


Excellent VA in far & intermediate distances (intermediate 60-80 cms).

Good near visión

LuxSmart™ The New EDOF IOL

MONOCULAR (3m) defocus Curve



Excellent range of vision from -1.75 D to +0.75 D for VA 0,2 LogMAR



LuxSmart™ The New EDOF IOL

Comparative optical bench analysis of a new premium intraocular lens designed for distance and intermediate vision

AUTHORS Juan Antonio Azor | Fidel Vega | Jesús Armengol | María S. Millán

Grupo de Óptica Aplicada y Procesado de Imagen (GOAPI) Department of Optics and Optometry
Universitat Politècnica de Catalunya BARCELONATECH. Barcelona, Spain

- Determination of the Through-Focus Modulation Transfer Function (MTF) at the single spatial frequency of 50 cycles/mm with monochromatic light ($\lambda=530$ nm). The setup was in agreement with the International Organization for Standardization (ISO) 11979-2 (2014) recommendations [ISO Standard].
- The MTF is obtained with three pupil diameters (2.0, 3.0, 4.5 mm) at the IOL plane.

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The Area under the Modulation Transfer Function (MTFa) and its relationship with the Visual Acuity

- The MTFa is an objective in vitro MFT-based metric to assess the optical quality of an intraocular lens: the larger the MTFa value, the better the IOL optical quality.
- As opposed to MTF at single spatial frequency, the MTFa is the area under the MTF curve calculated from 0 to 50 cycles/mm.
- Studies^{1,2,3} have shown high correlation between MTFa and clinical visual acuity, so that it can be used to predict the visual performance at different level of focus of pseudophakic patients.

1. Visual acuity of pseudophakic patients predicted from in-vitro measurements of intraocular lenses with different design. F. Vega et al. Biomed. Opt. Express 9, 4893-4906 (2018).

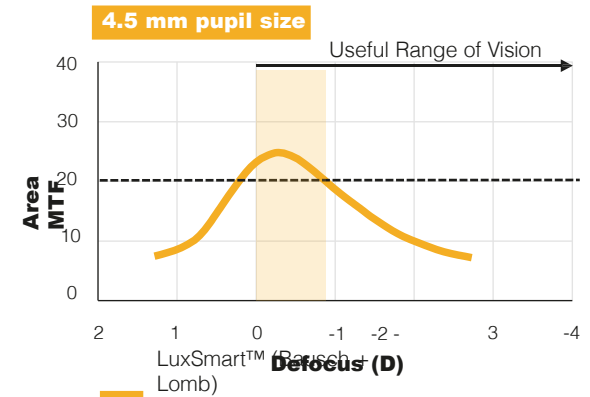
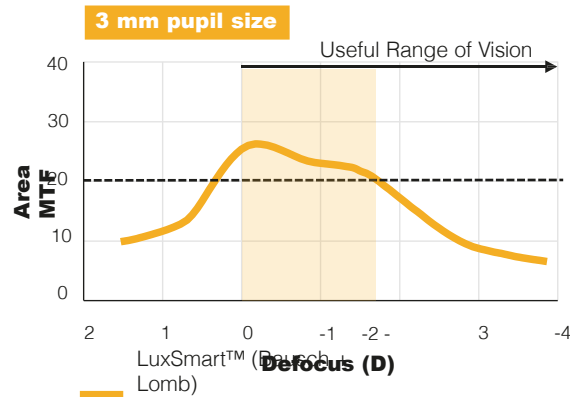
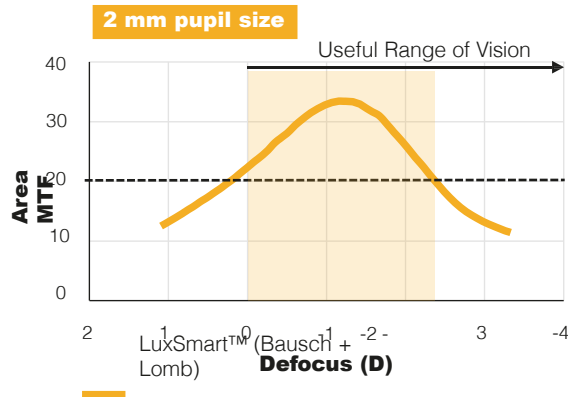
2. Preclinical metrics to predict through-focus visual acuity for pseudophakic patients. A. Alarcon et al. Biomed. Opt. Express 7, 1877-1888 (2016).

3. Equivalence of two optical quality metrics to predict the visual acuity of multifocal pseudophakic patients. J. Armengol et al. Biomed. Opt. Express 11, 2818-2829 (2020)

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MTFa, Area under the Modulation Transfer Function (MTF curve integrated from 0 to 50 cycles/mm)

LuxSmart™ useful range of vision: defocus range for which MTFa ≥ 20 and thus visual acuity ≈ 0.0 logMAR is expected^{1,2,3}



1. Visual acuity of pseudophakic patients predicted from in-vitro measurements of intraocular lenses with different design. F. Vega et al. Biomed. Opt. Express 9, 4893-4906 (2018).
2. Preclinical metrics to predict through-focus visual acuity for pseudophakic patients. A. Alarcon et al. Biomed. Opt. Express 7, 1877-1888 (2016).
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CONCLUSION

- EDoF IOLs provide us with an excellent option to improve the quality of vision of our demanding patients, achieving excellent far and intermediate vision usually with improved depth of focus that helps the patient in his daily activities.
- Compared to multifocal or Trifocal IOLs, it is true EDoF IOLs have their limitation for near, but on the other hand, they provide a natural continuous vision of high quality in the other distances preserving almost normal contrast sensitivity and without suffering the adverse phenomena like dysphotopsias, haloes and glare.

LuxSmart™ The New EDOF IOL

Practical Points & Recommendations

- LuxSmart IOL gives an excellent quality of vision for far & Intermediate distances. And in most of the patients, even very good near vision to the point that in many cases with bilateral LuxSmart IOL implantation the patient does not need optical correction for near vision.
- LuxSmart IOL gives best results in pupil diameters between 2-5 mm. So it is important to take it in consideration.
- It is important to explain well to the patient that the range of focus is from far vision till 60-80 cms. If the patient gains more near vision, (which happens frequently) it is always an added advantage .

LuxSmart™ The New EDOF IOL

Practical Points & Recommendations

- LuxSmart IOL is sensitive to negative residual refraction (residual Myopia). So it is recommended to choose the IOL power with first positive residual defect (residual Hyperopia) on the IOL calculation. The patient tolerates perfectly a low residual hyperopia.
- LuxSmart IOL is not very tolerant to astigmatic residual defects above -1,0 D cylinder. So we usually combine femto-laser Arcuate Incisions with the cataract procedure on patients with cylinders above -0,75 D

LuxSmart™ The New EDOF IOL

Practical Points & Recommendations

- To obtain best results, treat any existing MGD as it affects negatively the quality of vision and patient satisfaction in all premium IOL implantation.
- We usually treat patients with dry eye & MGD with IPL Laser before and after surgery as part of the protocol of Premium Cataract Surgery.

Keratograph 5M

Sistema de Medición y Evaluación para Topografía Corneal
y Screening de Ojo Seco



Muchas Gracias

