PREMIUM HYDROPHOBIC IOL

For your daily range of vision
The ESCRS Functional Vision Working Group reported that Europeans who are 55 years and older spend at least 6 hours per day on leisure activities¹, including playing games and computer use, relaxing/thinking, reading, watching television, socializing and communicating, participating in exercise, recreation, and other activities, including travel.

Figure 1. People aged ≥ 50 years old spending at least 3 hours per week on physical activity outside work

Figure 2. People aged 65-74 years who have never used a computer, 2008 vs. 2017

Figure 3. Time spent on shopping and personal services, > 65 years old

Figure 4. Average time that consumers who cook at home spend cooking each week (hours)

Besides leisure activities, several working distances are also needed for performing other common daily tasks, such as cooking, seeing the speedometer in a car, or walking on uneven ground.

¹ Ribeiro, Filomena MD, PhD; Cochener, Beatrice MD, PhD; Kohnen, Thomas MD, PhD; Mencucci, Rita; Katz, Gregory PhD, PharmD, MBA; Lundstrom, Mats MD, PhD; Casanovas, Antoni Salvà MD, PhD; Hewlett, David. Definition and clinical relevance of the concept of functional vision in cataract surgery. ESCRS Position Statement on Intermediate Vision. Journal of Cataract & Refractive Surgery: February 2020 - Volume 46 - Issue - p S1-S3 doi: 10.1097/j.jcrs.0000000000000096
PURE REFRACTIVE OPTICS (PRO) Technology
With no diffractive optical profile; the IOL* has a refractive surface across the entire optical diameter.

ELONGATED FOCUS CENTER
2 mm center with combination of 4th and 6th orders of spherical aberration of opposite signs

PERIPHERY
Refractive aspheric surface

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 orders of spherical aberration management
Transition designed to control the trajectory of light rays to ensure no light is outside the range of vision (no light loss)

*IOL: Intraocular lens
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.

Studies²,³,⁴ have shown high correlation between MTFa and clinical visual acuity, so that it can be used to predict the visual performance at different levels of focus of pseudophakic patients.

Figure 5. LuxSmart™ experimental Through-focus MTFa and predicted defocus range³

For defocus values where the MTFa value is ≥ 12 (dotted line), the expected visual acuity would be around 0.2 logMAR (required for driving license).

Figure 6. Depth of Focus comparison of experimental Through-focus MTFa and predicted defocus range for LuxSmart™ (Bausch + Lomb) and Acrysof™ IQ Vivity™ (Alcon)⁵

For defocus values where the MTFa value is ≥ 20, the expected visual acuity would be around 0.0 logMAR.

Figure 7. Pinhole images and halos for LuxSmart™ (Bausch + Lomb) and Acrysof™ IQ Vivity™ (Alcon) at distance (top) and intermediate (+1.50 D) focus (bottom) at 4.5 mm pupil. Images are displayed in logarithmic scale for visualization purposes⁶

Images of a pinhole object obtained at the distance focus of each lens with pupils of 4.5 mm. The images are displayed in logarithmic grayscale. The pinhole is a small but extended object which subtends an angle with respect to the model eye similar to the angle subtended by a car headlight of 10 cm observed at 100 m.

A double halo structure has an inner part with higher intensity due to the overlapping of the intermediate and distance defocused contributions.

FOR OPTIMIZED EFFECTIVENESS AGAINST PCO*

LuxSmart™ has a 360° continuous square edge on the posterior surface to reduce incidence of posterior capsule opacification in preventing epithelial lens cell migration under the IOL optic.6

Nixon and Woodcock7 demonstrated that a continuous 360° square edge had significantly less PCO than a square edge that was interrupted at the optic-haptic junction.

PROTECTION FROM UV LIGHT

Figure 8. Spectral transmission curves of LuxSmart™ and LuxSmart™ Crystal. The continuous vertical line marks the separation (380 nm) between the ultraviolet band and the visible spectrum.

Ultraviolet radiation wavelength cutoff values at 10 % of transmittance:
- LuxSmart™ Crystal: 393.5 nm
- LuxSmart™: 397 nm

PLATFORM STABILITY

The shape of the LuxSmart™ has been designed to optimize its post-operative behavior in the capsular bag.

- IOLs with a similar 4-point fixation haptic design have shown:
  - To have good centration8
  - To have similar postoperative performances in terms of CDVA, inflammation and PCO compared with the C-loop design8
  - To have rotational stability. 90 % of lenses rotate less than 5 degrees at 6 months9
  - To be stable in the eye and even suitable for the application of a toric surface to correct corneal astigmatism10

*PCO: Posterior capsule opacification
10. Buckhurst, Phillip J.; Wolffsohn, James S. PhD; Naroo, Shehzad A. PhD; Davies, Leon N. PhD Rotational and centration stability of an aspheric intraocular lens with a simulated toric design, Journal of Cataract & Refractive Surgery: September 2010 - Volume 36 - Issue 9 - p 1523-1528
SINGLE STEP FULLY PRELOADED INJECTION

LuxSmart™ and LuxSmart™ Crystal are only available in a preloaded version, taking the advantage of:

- Less risk of IOL damage and mishandling
- Usage of preloaded injection systems, which have been shown to produce faster and more predictable IOL delivery with less wound stretching
- It is thought that during the next several years, use of preloaded disposable injectors is expected to grow and may well represent the industry’s future

DELIVERY SYSTEM

Fully preloaded system with push injection: Accuject™ Pro
Recommended incision size: ≥ 2.2 mm (wound assisted technique)

TECHNICAL SPECIFICATIONS

**MATERIAL**
- Material: Acrylic hydrophobic
- Overall diameter: 11.00 mm
- Optic diameter: 6.00 mm
- Platform design: Single piece, 4 fixation points and 360° posterior square-edges
- Optical design: Asphericity modulation design with the combination of 4th and 6th orders of spherical aberration of opposite signs
- Haptics angulation: 0°
- Light Filter:
  - LuxSmart™ Crystal: UV filter
  - LuxSmart™: UV and violet filters
- Diopter range:
  - From 0.00 D to +10.00 D (1.00 D steps)
  - From +10.00 D to +34.00 D (0.50 D steps)
- Refractive index: 1.54 at 35°
- Orientation features: Top right and bottom left

**CONSTANTS***

**OPTICAL CONSTANTS**
- SRK/T A constant: 118.5
- Hoffer Q pACD: 5.23
- Holladay I Surgeon factor: 1.48
- Haigis: a0: 1.045 / a1: 0.4 / a2: 0.1
- EVO A constant: 118.5
- Barret A constant: 118.4 / Lens Factor: 1.57
- Hill-RBF 2.0 A constant: 118.32

*Constants are estimates only. It is recommended that each surgeon develops their own values.

Scan the code to access a real implantation video.

Courtesy of Dr. Hoerster, Germany
DIVE DEEP INTO THE LUXSMART™ MOVEMENT

Discover peer and patient testimonials and how LuxSmart™ can help you.

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