

ZEISS CT LUCIA

THREE KEY HIGHLIGHTS OF THE MONOFOCAL, HYDROPHOBIC LENS

ZEISS is committed to continuously investing in its product portfolio, spending a significant amount of its annual turnover in 2015/2016 on research and development. With respect to its hydrophobic acrylic lens – CT LUCIA®, the company has specifically focused on perfecting its fully preloaded injector system, optimizing the optical performance of the lens as well as improving its lens design. This article provides an overview of three important key highlights of the lens and summarizes a recent study of postoperative refractive results.

HIGHLIGHT NO. 1: PATENTED ASPHERIC ZEISS OPTICS DESIGN.

The uniqueness of every human eye provides additional challenges when it comes to centration of the lens in the eye, including the visual outcome after implantation. When the IOL is not correctly centered, degradation of contrast sensitivity can occur in some conditions, especially in low light. The patented aspheric ZEISS Optics design (Figure 1) compensates for a range of aberrations that can occur from various corneal shapes and with lens misalignments. With its patented design, the CT LUCIA can provide better image quality for patients in a variety of real-life conditions.

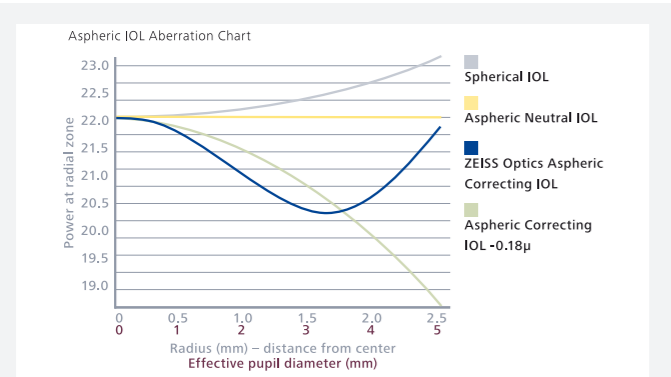


FIGURE 1. The different levels of optical designs and asphericities currently available in the market.

HIGHLIGHT NO. 2: 360° SQUARE EDGE.

In the constant process of improving its IOLs, ZEISS achieved a posterior 360° square edge of the LUCIA to a radius of less than 3 µm (Figure 2). Proprietary lathe cut manufacturing technology provides edge sharpness and edge integrity, which can prevent cell migration and early posterior capsular opacification (PCO).

Research has shown that square-edged IOLs blocks lens epithelial cells from migrating past the barrier, preventing PCO development.¹ This effect has been demonstrated in hydrophobic acrylic, silicone, and polymethylmethacrylate IOLs.²

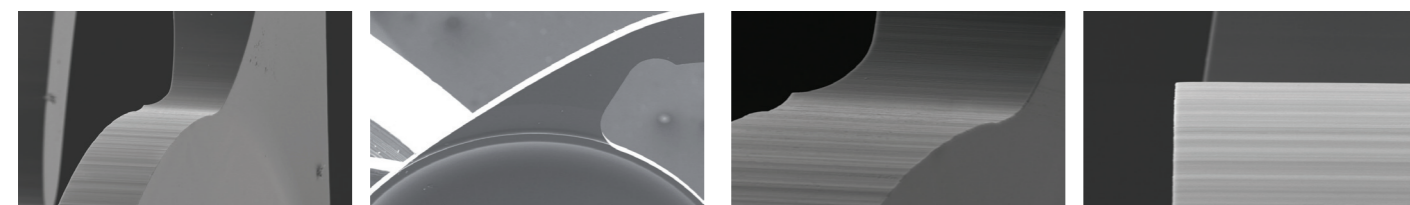


FIGURE 2. Scanning electron microscope images at 200 µm (top) and 80 µm (bottom), depicting the high-quality sharp-edge design of the ZEISS CT LUCIA. The images were taken at the Technical University of Berlin.

HIGHLIGHT NO. 3: BLUEJECT™ - THE NEW ENHANCED FULLY PRELOADED INJECTOR SYSTEM.

The CT LUCIA comes completely preloaded in ZEISS' latest injector, the BLUEJECT™ (Figure 3). Thanks to its advanced design and the lens being fully preloaded, lens preparation is fast and easy, while avoiding unwanted IOL manipulation. The injector is available in a variety of tip sizes and can be used with the entire diopter range of CT LUCIA IOLs. The BLUEJECT™ 2.0 mm tip injector can be used for the diopter range of 4.00 to 24.00 D, the BLUEJECT™ 2.2 tip injector for the diopter range of 24.50 to 30.00 D, and the BLUEJECT™ 2.4 tip injector for the diopter range of 30.50 to 34.00 D. The incision size is recommended to be 0.2 mm larger than the actual tip size. With a 2.0 mm injector tip and heparin coating on the IOL surface, ZEISS CT LUCIA can be implanted through small incisions with smooth unfolding into the capsular bag – without the haptics sticking to the optic.³



FIGURE 3. The BLUEJECT™ injector, compatible with the ZEISS CT LUCIA.

POSTOPERATIVE OUTCOMES

Several studies have documented the excellent postoperative outcomes of the CT LUCIA lens platform. In one recent study of 336 patients who had the CT LUCIA 601P or 601PY implanted during cataract surgery, 67.5% achieved a postoperative refraction within ±0.50 D of predicted refraction, and 91.6% were between ±1.00 D when the Haigis formula was used as a benchmark (Table 1). A similar result was obtained when the SRK/T formula was used as a benchmark (Table 1). In this model, 68.1% of patients achieved a postoperative refraction within ±0.50 D of predicted refraction, and 93.1% were within ±1.00 D. Table 2 shows the refractive outcomes using the means of the Haigis and SRK/T formulas as benchmarks. In short, **69.3%** of patients achieved a postoperative refraction within **±0.50 D** of predicted refraction and **93.4%** within **±1.00 D**. Roland Ling BM, BCh (Oxford), FRCOphth (London), performed all procedures. The results compared favorably with the Royal College of Ophthalmologists guidelines⁴, which state that refractive outcomes should be within ±1.00 D of the target in 85% of cases. "In summary, the refractive outcomes of cataract surgery at the Medical Eye Clinic, Exeter, United Kingdom, using the combination of IOL Master 700 biometry (ZEISS) and implantation of the CT LUCIA IOL had been excellent," stated Mr. Ling, Consultant Ophthalmic Surgeon.⁵

Table 1. Refractive outcomes using haigis and SRK/T formulas as benchmarks

Actual Postoperative Refraction	Haigis: Number of Patients (%)	SRK/T: Number of Patients (%)
> -1.00 D	11 (3.3)	10 (3)
-0.50 to -1.00 D	34 (10.1)	37 (11)
0 to -0.50 D	117 (34.8)	111 (33)
0 to 0.50 D	110 (32.7)	118 (35.1)
0.50 to 1.00 D	47 (14)	47 (14)
> 1.00 D	17 (5.1)	13 (3.9)
Total	336	336

Table 2. Refractive outcomes using the means of haigis and SRK/T formulas as benchmark

Difference Between Actual Refraction and Mean of Haigis & SRK/T Prediction (Spherical Equivalent)	Number of Patients	% of Total
> -1.00 D	8	2.4
-0.50 to -1.00 D	34	10.1
0 to -0.50 D	115	34.2
0 to 0.50 D	118	35.1
0.50 to 1.00 D	47	14.0
> 1.00 D	14	4.2
Total	336	100

SUMMARY

The CT LUCIA is a reliable monofocal lens choice as part of the ZEISS IOL portfolio. Through constant enhancements and continual testing by the ZEISS research and development team and by cataract surgeons in their clinical practices, the performance of the lens has been maximized even further in order to provide patients with a fully enhanced and optimized lens design that meets their growing expectations. ■

REFERENCES

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5. Mr Roland Ling BM, BCh (Oxford), FRCOphth (London) Consultant Ophthalmic Surgeon, Royal Devon & Exeter Hospital Medical Director, the Medical Eye Clinic, Refractive outcomes study, Data on file, Exeter, United Kingdom, 2016.