ZEISS CT LUCIA

Treating a wide range of patients
with a unique ZEISS Optic

(Based on the ZEISS CT LUCIA 621P/PY)

zeiss.com/lucia

ZEISS

Seeing beyond

ZEISS CT LUCIA

Treating a wide range of patients with a unique ZEISS Optic.

ZEISS CT LUCIA® 621P/PY – a new generation of aspheric, monofocal, hydrophobic C-loop IOLs with the patented ZEISS Optic (ZO) Asphericity concept. Designed to mitigate against potential decentration issues and to confidently deliver good visual outcomes.

The architecture of the IOL enables very stable positioning in the capsular bag for consistent and excellent performance. The latest CT LUCIA 621P/PY comes in a new and improved fully preloaded injector system for an easy and intuitive cataract workflow.

Key benefits:

- Consistent visual outcomes*
- Excellent stability
- Intuitive injector handling

Part of the **ZEISS Cataract Workflow**

zeiss.com/cataract-workflow

ZEISS CT LUCIA

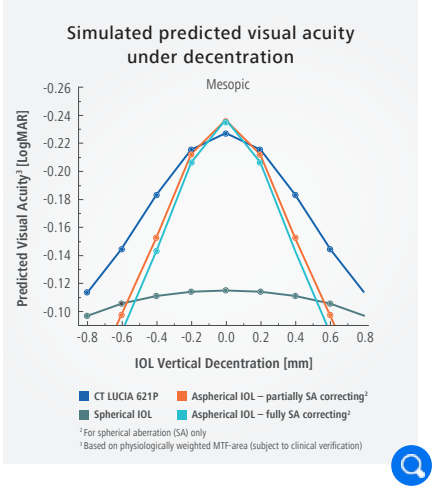
Aspheric C-loop
ZEISS CT LUCIA 621P
- Monofocal
- Aspheric (aberration-correcting)
- Hydrophobic acrylic with heparin-coated[1] surface

Aspheric C-loop
ZEISS CT LUCIA 621PY
- Monofocal
- Aspheric (aberration-correcting)
- Hydrophobic acrylic with heparin-coated[1] surface
- Blue light filter

Spherical C-loop
ZEISS CT LUCIA 221P
- Monofocal
- Spheric
- Hydrophobic acrylic with heparin-coated[1] surface

3 key benefits

CONSISTENT VISUAL OUTCOMES*



ZEISS Optic Design
The sophisticated and patented ZEISS Optic (ZO) Asphericity Concept of the ZEISS CT LUCIA 621P/PY is designed to compensate for a wide range of aberrations resulting from different corneal shapes and lens positions. With its uniquely forgiving design, it delivers good visual outcomes for a broad range of patients and surgical situations.

EXCELLENT STABILITY

Optic-haptic junction – designed to ensure refractive stability
Coupled with step-vaulted C-loop haptics, enable easy centering while maximizing direct capsular contact, thus ensuring stability and supporting a consistent and stable axial IOL position in the capsular bag.

INTUITIVE INJECTOR HANDLING

Enhanced design – for a simplified surgical workflow
The design of the latest fully preloaded injection system of the ZEISS CT LUCIA has been improved to make handling easier and more intuitive.

Recent enhancements simplify the surgical workflow, providing a smooth preparation process that enables successful implantation of the lens in an easy and efficient manner.

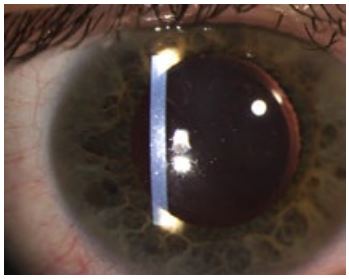
Consistent visual outcomes*

Forgiving to decentration – beneficial to visual acuity*

Every eye is as individual as the patient. Typically, the human eye is not optically symmetric, which can lead to IOL decentration.

Does decentration matter?

Yes! Decentrations of varying magnitudes are not uncommon. Besides the asymmetry of the eye, decentration of IOLs can occur due to poor capsular or zonular support, decentered capsulorhexis, asymmetric shrinkage of the capsular bag, misplacement of the haptics or IOL luxation in eyes with pseudoexfoliation. ZEISS CT LUCIA 621P/PY IOLs, with ZEISS Optic features, are designed to compensate for potential decentration and lens misalignments. Reducing the risk of decentration allows you more time to focus on your patients and their needs.



Slit lamp examination showing a misalignment of the pupil and IOL

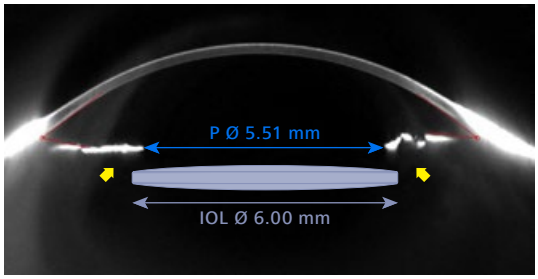


Image of the off-centered position of the IOL

Benefits for you and your patients

With its sophisticated ZEISS Optic asphericity profile, the ZEISS CT LUCIA 621P/PY ensures a smooth surgery and consistent visual outcomes,* even in challenging cases.

What is the secret behind the unique ZEISS Optic?

The ZEISS CT LUCIA 621P/PY offers the best of both worlds: Leveraging a unique asphericity concept to provide excellent visual outcomes for a broad range of patients and surgical situations, and compensating for a wide range of aberrations due to different corneal shapes and lens positions. Optical simulations with various aspherical optic designs show that the ZEISS CT LUCIA 621P delivers excellent image quality under mesopic (Fig. 1) conditions, even at larger decentrations.

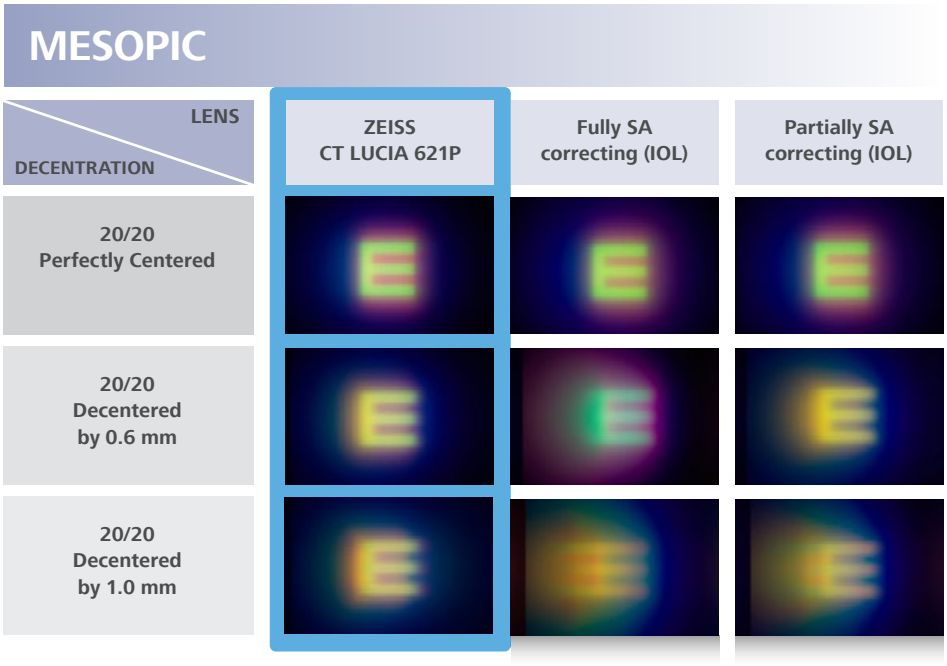


Fig. 1: Table: Optotype simulation for best-corrected distance vision*

High tolerance to decentration for better visual acuity and image quality*

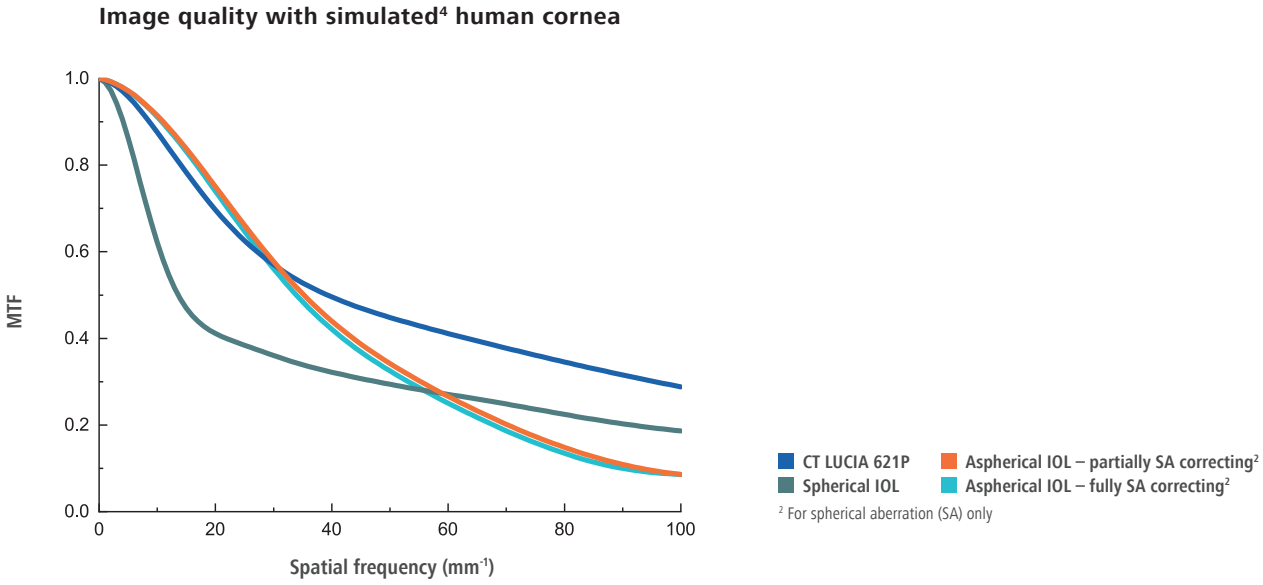


Fig.2: Modulation transfer function (MTF) of various optic designs in an eye model with a simulated human cornea of 4.5 mm aperture and 0.5 mm lens decentration[4]

The ZEISS Optic was engineered based on the realistic Liou-Brennan eye model[4], which is optimized for a pupil size typically found in cataract patients.

Central zone with negative spherical aberration to balance corneal aberration for an improved image quality (Fig. 2)

Peripheral zone with positive spherical aberration to increase decentration tolerance (Fig. 3, 4)

Ideal balance between aberration correction and neutral effects (Fig. 5)

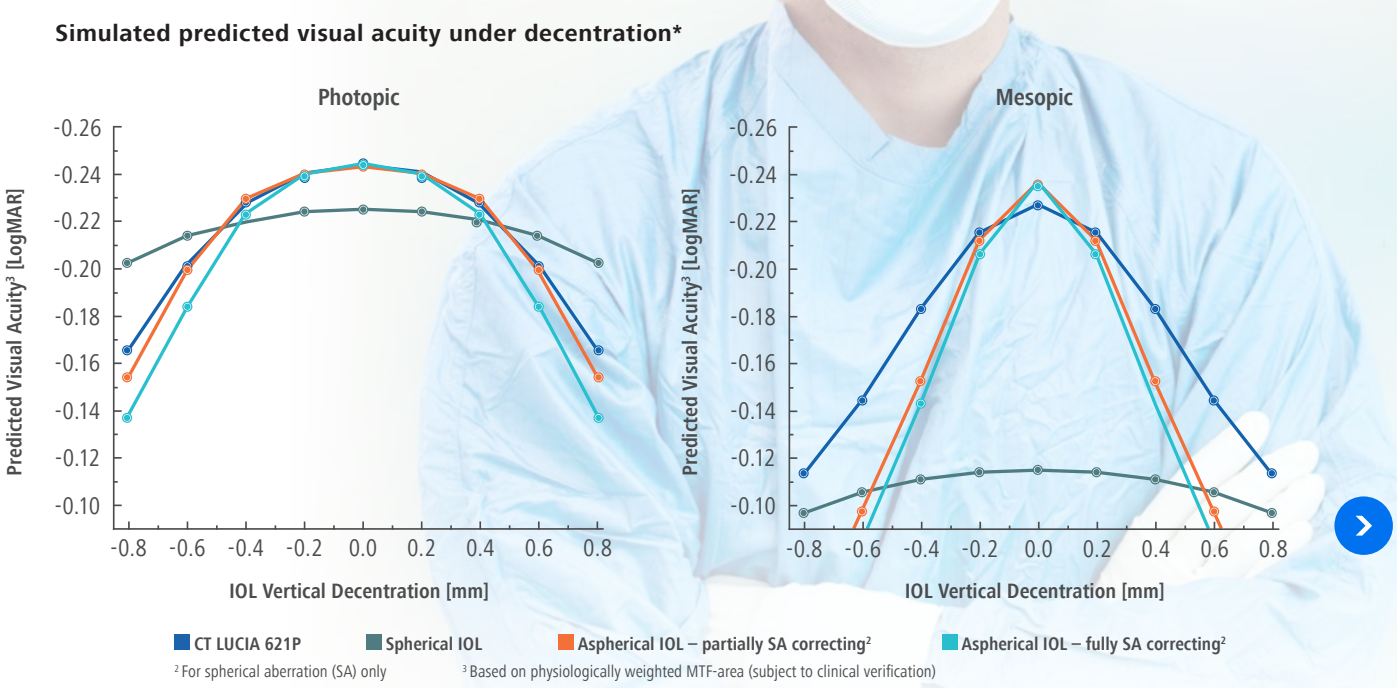


Fig. 3: Influence of decentration on photopic predicted visual acuity.

Fig. 4: Influence of decentration on mesopic predicted visual acuity.

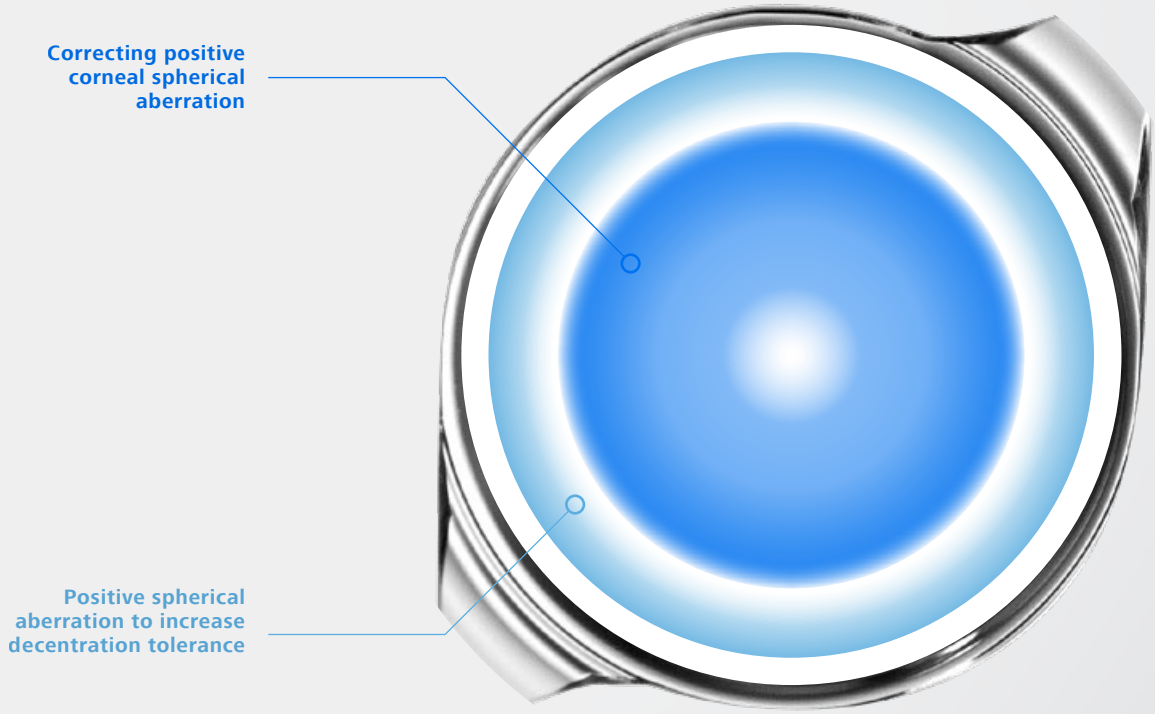


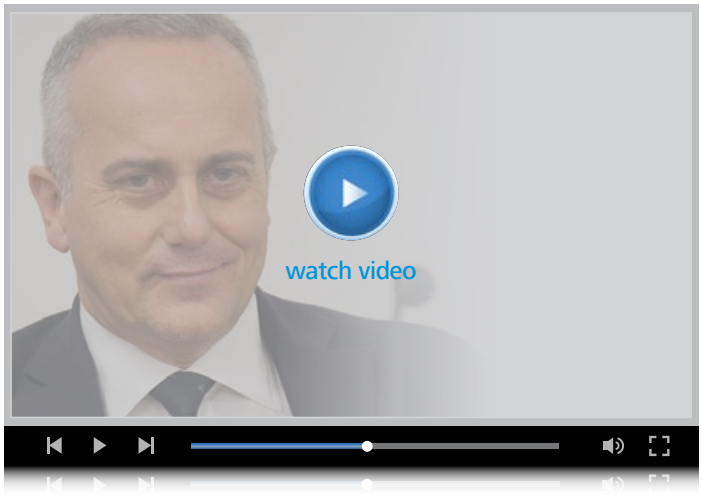
Fig. 5: Aberration profile of the ZEISS CT LUCIA 621P/PY with non-uniform power distribution (schematic visualization, image not to scale)

Excellent stability

ZEISS CT LUCIA 621P/PY IOLs feature an optic-haptic junction designed for refractive stability. Coupled with step-vaulted C-loop haptics, this enables centering while maximizing direct capsular contact, thus ensuring stability and supporting a consistent, stable axial IOL position in the capsular bag.

> *I appreciate the reproducibility in unfolding the haptics in the bags and also the stability in the first part of the injection, and the proximity of finding the lens exactly in the same place in which I left it.*

Dr. di Carlo, Turin, Italy[5]



Dr. di Carlo, Turin, Italy[5]

The sophisticated sharp-edge design of the ZEISS CT LUCIA

"… most researchers agree that the best IOL is one that has a sharp edge for the entire 360 degrees of the posterior surface of its optic."[6]

Sophisticated edge design

The lathe-cut manufacturing technology provides edge sharpness and integrity. The ZEISS CT LUCIA 621P/PY provides a 3 µm radius sharp-edge design to prevent early cell migration and posterior capsule opacification.

The following images were produced at the Technical University of Aalen using scanning secondary electron microscope (SEM) analysis with ZEISS Sigma 300 VP secondary electron contrast (image size 3072 × 2304 pixels) to visualize the sharp-edge design of the ZEISS CT LUCIA 621P/PY (Fig. 6 a – d).

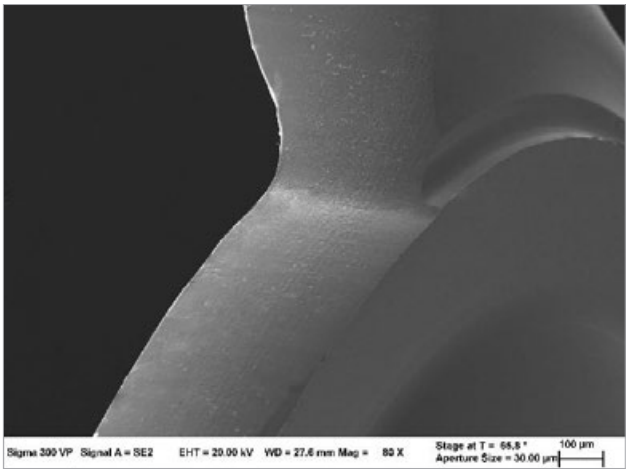


Fig. 6 a

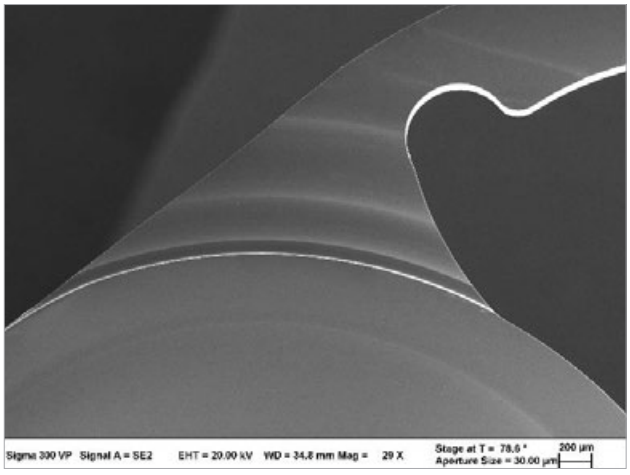


Fig. 6 b

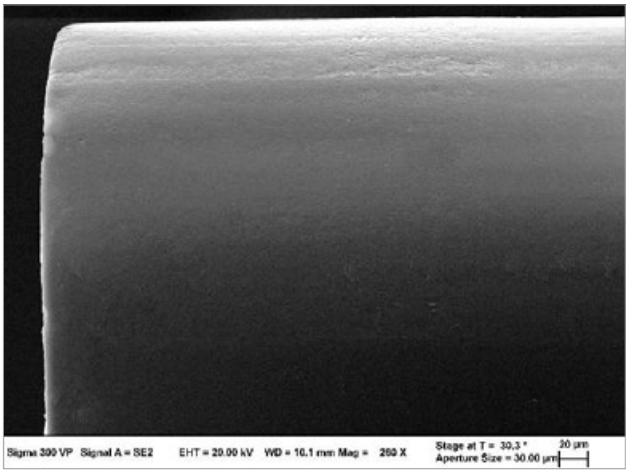


Fig. 6 c

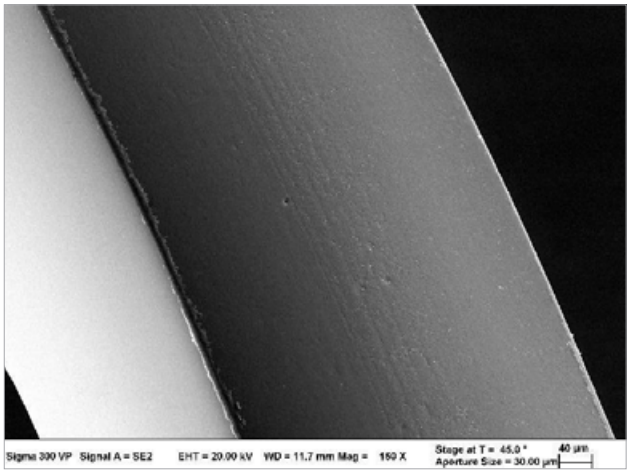
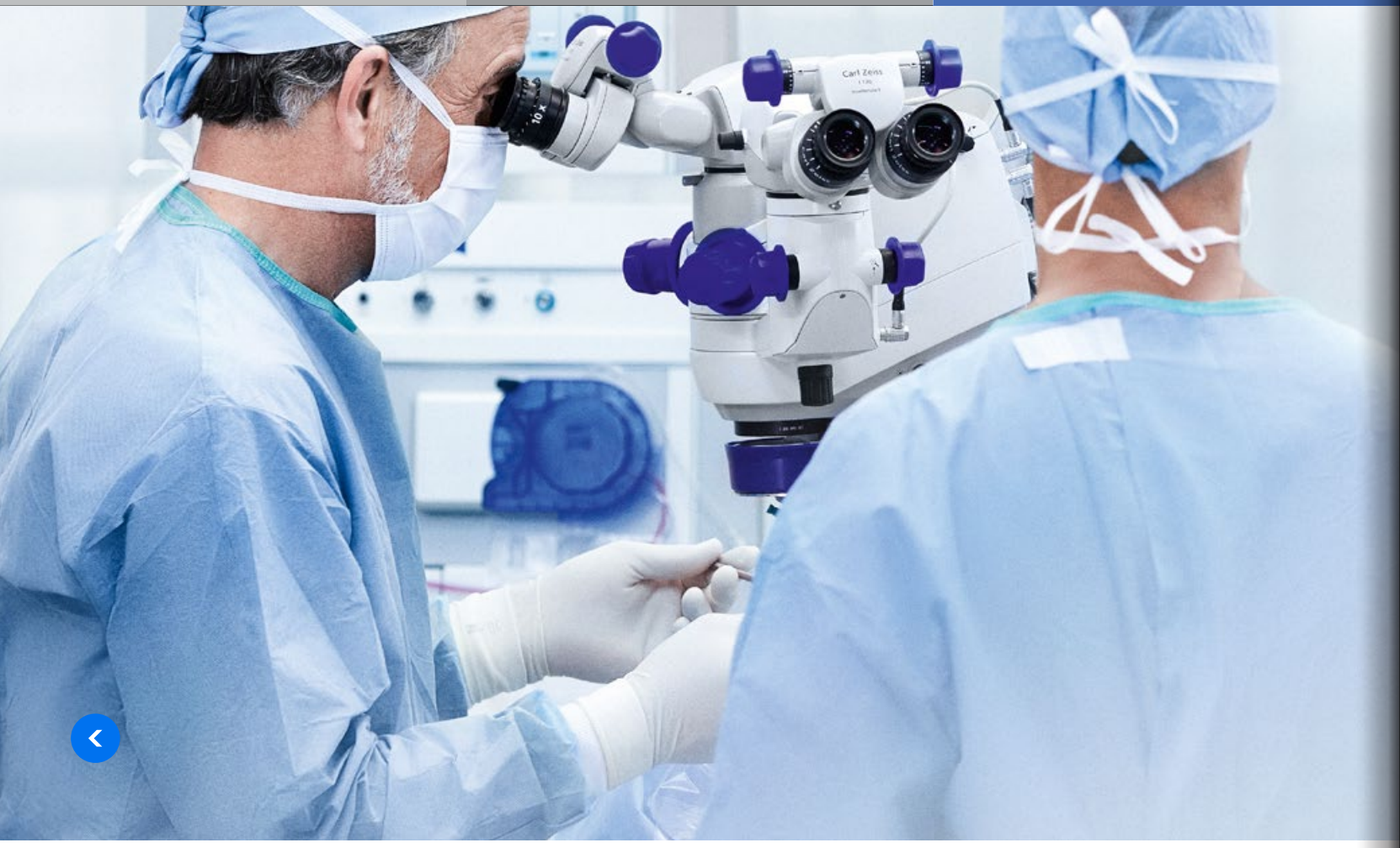


Fig. 6 d

Fig. 6 a – d: The ZEISS CT LUCIA 621P/PY optic-haptic-junction – and images of the sharp-edge (Scanning secondary electron microscopic analysis (SEM) with ZEISS Sigma 300 VP secondary electron contrast)



Excellent stability

Proven in practice

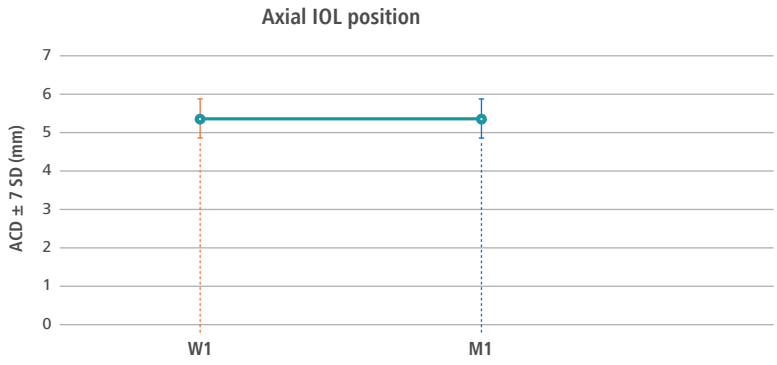
A recent “real-world” evaluation of cataract surgery using the ZEISS CT LUCIA 621P in a routine setting by Dr Antonino Cuttitta[5] (Palermo, Italy)[7] confirms the robust predictability and safety of the IOL, with very good clarity of vision for patients postoperatively.
The evaluation included 60 eyes with cataracts, with the majority of patients also reported as having concomitant diseases such as hypertension or diabetes that could potentially affect visual outcomes. The age of the patients in this cohort ranged from 51 to 91.

Conclusion

The ZEISS CT LUCIA 621P provides a combination of high optical quality and an intuitive and easy-to-use preloaded delivery system, helping the surgeon to fulfill patients' expectations of a predictable and impressive visual performance.

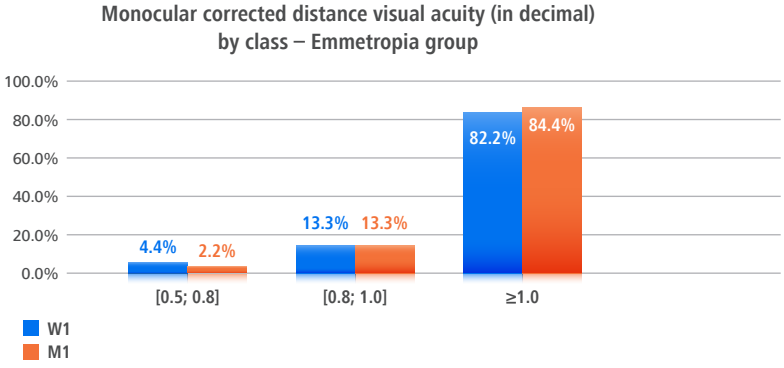
Stable lens position

The axial IOL position and stability of the ZEISS CT LUCIA 621P was assessed with the ZEISS IOLMaster 700.
Anterior chamber depth (ACD) was also measured to reflect the positional stability of the implanted IOL. The ZEISS CT LUCIA 621P showed an **excellent positional stability**, with no significant changes between 1 week and 1 month after surgery.



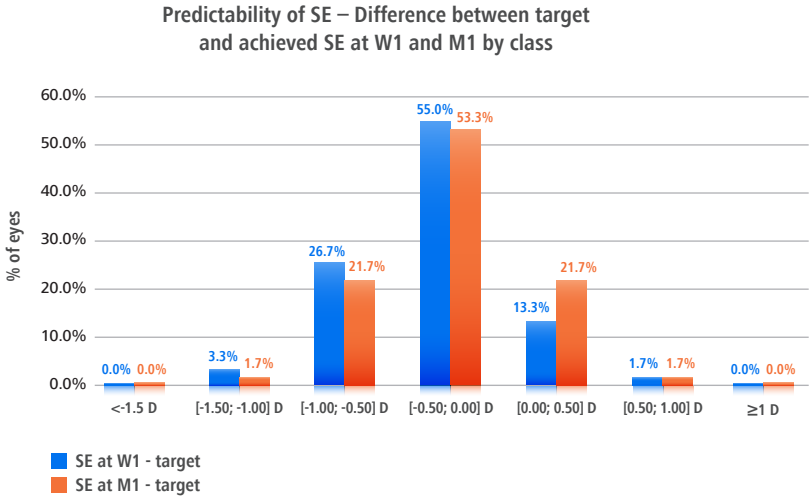
Visual acuity

In real-world situations, the ZEISS CT LUCIA 621P achieved very good corrected distance visual acuity (CDVA) results, with a mean monocular CDVA for eyes targeted for emmetropia (n=45) of 0.97 ± 0.08 (decimal; mean ± SD) one month after surgery. Over 84% of eyes in this group achieved a CDVA of 1.0 (decimal) or better.



Refractive predictability

Using a patient data set that compared achieved and targeted refraction, it was found that 75% (53.3% + 21.7%) of eyes achieved a spherical equivalent (SE) within ±0.5 D of the targeted refraction (some patients had astigmatism, which was not corrected during surgery; this explains the percentage of patients outside the ±0.5 D result).



Intuitive injector handling

Surgeons' experiences with ZEISS CT LUCIA 621P/PY

The design of the latest fully preloaded injection system of the ZEISS CT LUCIA 621P/PY has been improved to make handling easier and intuitive for the target users. Recent enhancements simplify the surgical workflow, providing a smooth preparation process that enables successful implantation of the lens in an easy and efficient manner.

Surgeons and nurses from around Europe recently had the chance to experience the ZEISS CT LUCIA 621P/PY preloaded injector system in 521 implantations during an early access program. They provided positive feedback on the ease of use of the improved injector, as well as a high level of reproducibility.

> *It is a three-step designed, fully preloaded injector system, and, I guess, for rookies and for high-volume surgeons, very beneficial in daily routine. The reliability and the stability of the injector are much better than in the predecessor. It's very easy now, and it's very reliable.*
>
> ***Dr. Borkenstein, Graz, Austria[5]***

Dr. Borkenstein, Graz, Austria[5]

Conclusion

98% of the testing surgeons and nurses agreed that the overall performance of the CT LUCIA 621P/PY is preferred over other injections of choice, even over known gold standard injectors. Particularly advantageous was the homogenous injector force, resulting in a high percentage of reproducibility and ease to implant the lens in the bag.[8]

Surgeons' evaluations: In total 11 doctors & 9 nurses in Germany, France, Spain, Italy, Portugal, Sweden & Austria were involved[5]

Dr. Adam + resident – Paris, France, **Dr. Amaro + nurse –** Lisbon, Portugal, **Dr. Borkenstein –** Graz, Austria, **Dr. Cuttitta –** Palermo, Italy, **Dr. di Carlo + nurse –** Turino, Italy, **Dr. Hettlich + nurse –** Minden, Germany, **Dr. Johansson + nurse –** Kalmar, Sweden, **Dr. Loqvist + nurse –** Elskistuna, Sweden, **Dr. Merkoudis + nurse** – Elskistuna, Sweden, **Dr. Monnet + resident –** Paris, France, **Dr. Roldan + nurse –** Seville, Spain

Report on performance in surgery

ZEISS CT LUCIA 621P/PY

Easy to handle

In most operating rooms, the surgical staff is responsible for preparing the IOL for implantation before handing it to the surgeon.
The ZEISS CT LUCIA 621P/PY scored very highly in this preparatory phase and helps to reduce surgery time with its intuitive and easy use.

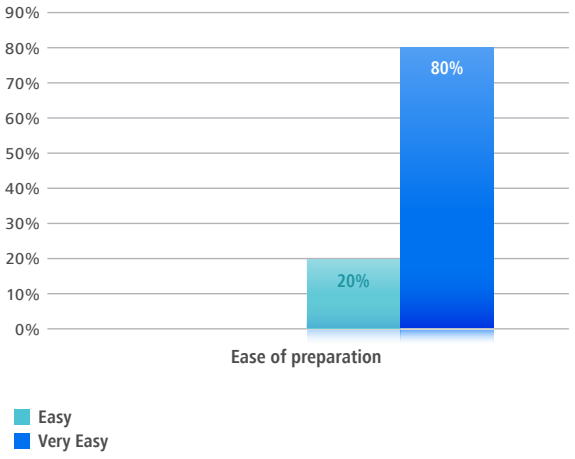
Smooth and controlled injection

The preloaded ZEISS CT LUCIA 621P/PY has a heparin-coated[1] surface for a smoother injection and unfolding process. Minimal injection force was needed to advance the lens, and nurses and surgeons appreciated the use of audible clicks to track progress as the lens reached the injector tip.
The IOL was also found to leave the injector tip in a safe, predictable and highly reproducible fashion, with no issues of trailing or trapped haptics or other complications.

Excellent performance

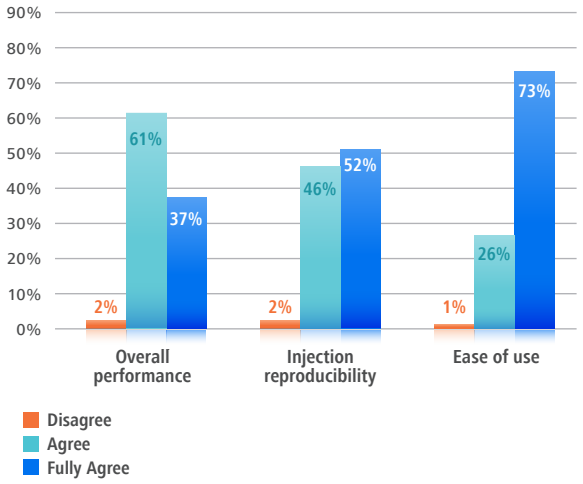
The ZEISS CT LUCIA 621P/PY represents a fully preloaded delivery system. All respondents who have influence on the choice of IOL, reported that they would use the ZEISS CT LUCIA 621P/PY on a routine basis, mainly due to its ease of use, injection reproducibility and overall performance.

Preparation (Nurse)**



** Based on 521 CT LUCIA 621P implantations.

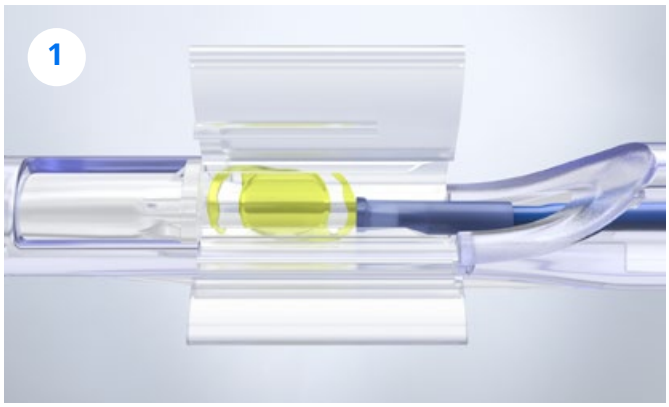
Are you more satisfied with CT LUCIA 621P compared to your current device?**



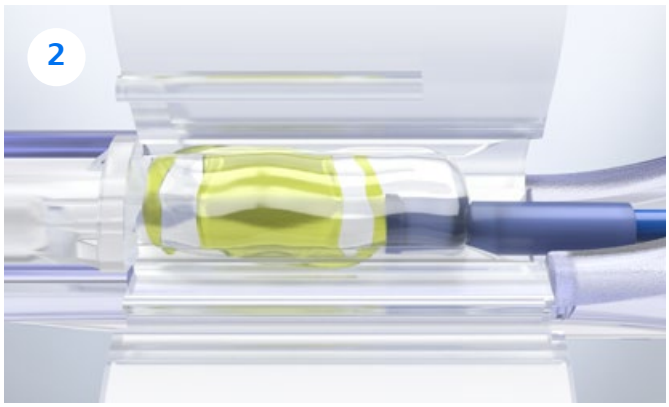
** Based on 521 CT LUCIA 621P implantations.

Handling instructions

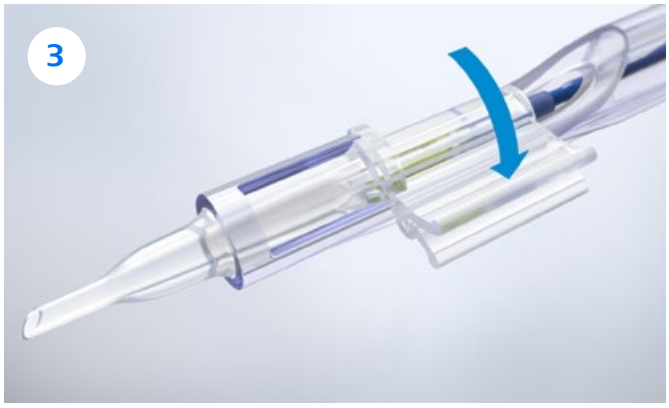
Preparing the new ZEISS CT LUCIA 621P/PY



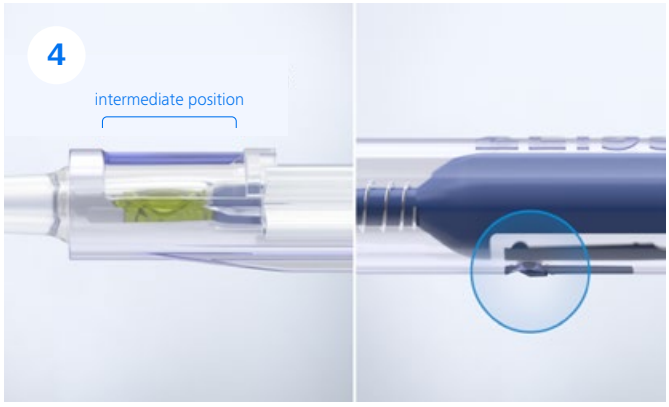
Verify the lens is central and secure in the IOL chamber.



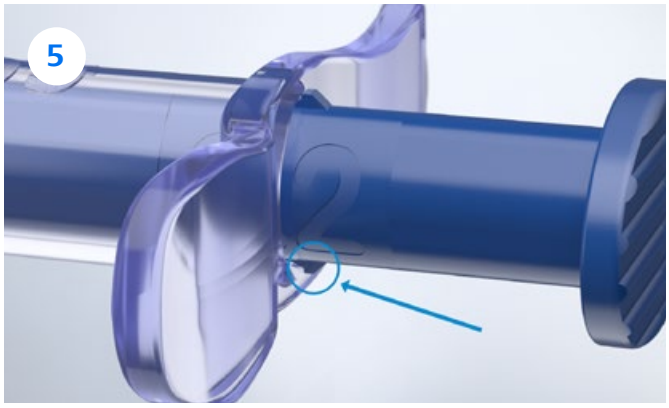
Cover the whole lens and blue plunger tip with a generous amount of OVD. Avoid touching the lens and blue plunger tip.



Close the lid of the IOL chamber.
IMPORTANT: Allow the lens to remain in this position until the surgeon is ready to deliver it to the eye.



Advance the lens to the intermediate position. Gently press the plunger forward until an audible 'click' is heard.
IMPORTANT: The lens should be implanted immediately.



Slowly advance the lens until it has been released from the injector. If delivery is incomplete, apply additional pressure to the thumb flange to release the lens.

6 Carefully position the lens in the capsular bag.
7 Discard the device. Do not reuse the delivery system.

Implantation recommendations

General advice: before implantation, please check the orientation of the IOL and retract the plunger to ensure there is a space between the plunger and the IOL.

Possible haptic configuration	Possible IOL behavior	Recommendation	CT LUCIA 621PY injection picture	Schematic drawing
Both haptics are tucked on the optic (ideal scenario)	Correct position	Proceed		
Leading haptic is looped but not over the optic	Haptic can swing out and is slightly off-axis but pointing in the correct direction.	Proceed		
Leading haptic twisted	The leading haptic becomes twisted and can point downward and/or to the right, the optic can begin to roll counter clockwise and even roll upside down.	Rotate the injector clockwise (bevel left) to ensure the leading haptic is correctly positioned in the capsular bag and proceed as normal.		
Plunger overriding trailing haptic	The haptic could become pinned between the cartridge and the plunger cushion and the IOL could become stuck in the injector tip. It is possible that the haptic could tear.	Do not proceed		

Technical specifications

ZEISS CT LUCIA 621P/PY

CT LUCIA® 621P – fully preloaded	
Optic Design	Monofocal, aspheric (aberration correcting)
Material	Hydrophobic acrylic with heparin coated[1] surface
Optic Diameter	6.0 mm
Total Diameter	13.0 mm
Haptic	Step vaulted
Lens Design	Single-piece
Company Labeled A-Constant[9]	120.2
Incision Size	2.2 – 2.6 mm (depending on diopter)
Diopter Range	From 0.0 to +34.0 D, 0.5 D increments
ACD[9]	6.29
Abbe Number	51
Refractive Index	1.49
Implantation in	Capsular bag

CT LUCIA 621PY – fully preloaded	
Optic Design	Monofocal, aspheric (aberration correcting)
Material	Hydrophobic acrylic with heparin coated[1] surface and blue light filter
Optic Diameter	6.0 mm
Total Diameter	13.0 mm
Haptic	Step vaulted
Lens Design	Single-piece
Company Labeled A-Constant[9]	120.2
Incision Size	2.2 – 2.6 mm (depending on diopter)
Diopter Range	From 0.0 to +34.0 D, 0.5 D increments
ACD[9]	6.29
Abbe Number	50
Refractive Index	1.49
Implantation in	Capsular bag

Injector/Cartridge Set	
Relevant for CT LUCIA 621P and CT LUCIA 621PY	BLUESERT™ 2.2 Injector for diopter range 0.0 to +24.0
	BLUESERT 2.4 Injector for diopter range +24.5 to +30.0
	BLUESERT 2.6 Injector for diopter range +30.5 to +34.0

Technical specifications

ZEISS CT LUCIA 221P

CT LUCIA 221P – fully preloaded	
Optic Design	Monofocal, spheric
Material	Hydrophobic acrylic with heparin coated[1] surface
Optic Diameter	6.0 mm
Total Diameter	13.0 mm
Haptic	Step vaulted
Lens Design	Single-piece
Company Labeled A-Constant[9]	119.8
Incision Size	2.2 – 2.6 mm (depending on diopter)
Diopter Range	From 0.0 to +34.0 D, 0.5 D increments
ACD[9]	6.03
Abbe Number	51
Refractive Index	1.49
Implantation in	Capsular bag

Injector/Cartridge Set	
	BLUESERT™ 2.2 Injector for diopter range 0.0 to +24.0
	BLUESERT 2.4 Injector for diopter range +24.5 to +30.0
	BLUESERT 2.6 Injector for diopter range +30.5 to +34.0

* The data is taken from a simulation. The transferability of the results of such a simulation to patients with an actual implanted intraocular lens has not yet been scientifically proven. Whether the simulated impressions correspond to the actual visual impressions must be clarified in future invasive studies.

[1] Fragment of heparin used in IOL surface coating with no pharmacological, immunological or metabolic action.
[2] For spherical aberration (SA) only.
[3] Based on physiologically weighted MTF-area (subject to clinical verification).
[4] The model by Liou and Brennan contains features of the biological eye that were not considered in previous eye models, such as the distribution of a decentered pupil. Furthermore, it has great reliability as it takes into account the mean value of the empirical measurements of the in vivo eye in order to define its size and parameters such as anterior and posterior curvature of cornea, axial length, etc.
Hwey-Lan Liou and Noel A. Brennan: "Anatomically accurate, finite model eye for optical modeling", Journal of the Optical Society of America A, Vol. 14, Issue 8, pp. 1684-1695 (1997)
[5] The statements of the doctors presented reflect only their personal opinions and do not necessarily reflect the opinions of an institution with which they are affiliated. The doctors shown have a contractual or other financial relationship with Carl Zeiss Meditec and have received financial support.
[6] *Review of Ophthalmology*, "IOL Design Closes Off PCO", 01/2003
[7] Based on cohort data collected from Dr Cuttitta (University of Palermo, Italy) after implantation of CT LUCIA 621P IOLs in sixty eyes. Internal report on CT LUCIA 621P data collection (Dr Cuttita) - Version 1.1 dated 19.11.2019
[8] CT LUCIA 621P – Surgeon evaluation report (Apr-Sep 2019) - Report on surgery Performance CT LUCIA 621P injector. Results are based on 521 implantations.
[9] For optimized A Constants and ACD Constants, refer to IOLCon: www.iolcon.org

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ZEISS CT LUCIA 221P
ZEISS CT LUCIA 621P/PY

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