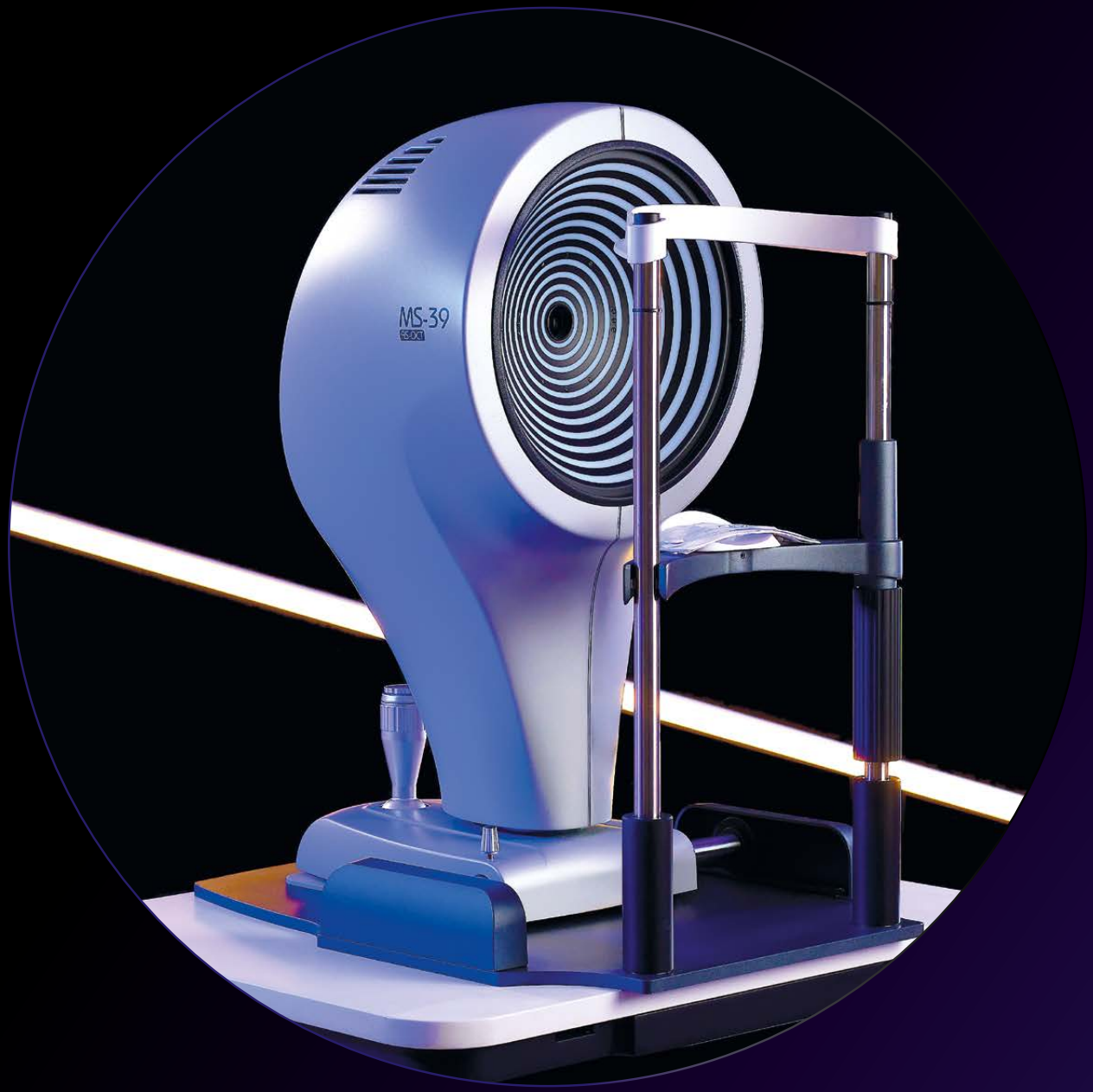


CSO

MS-39

Anterior Segment OCT

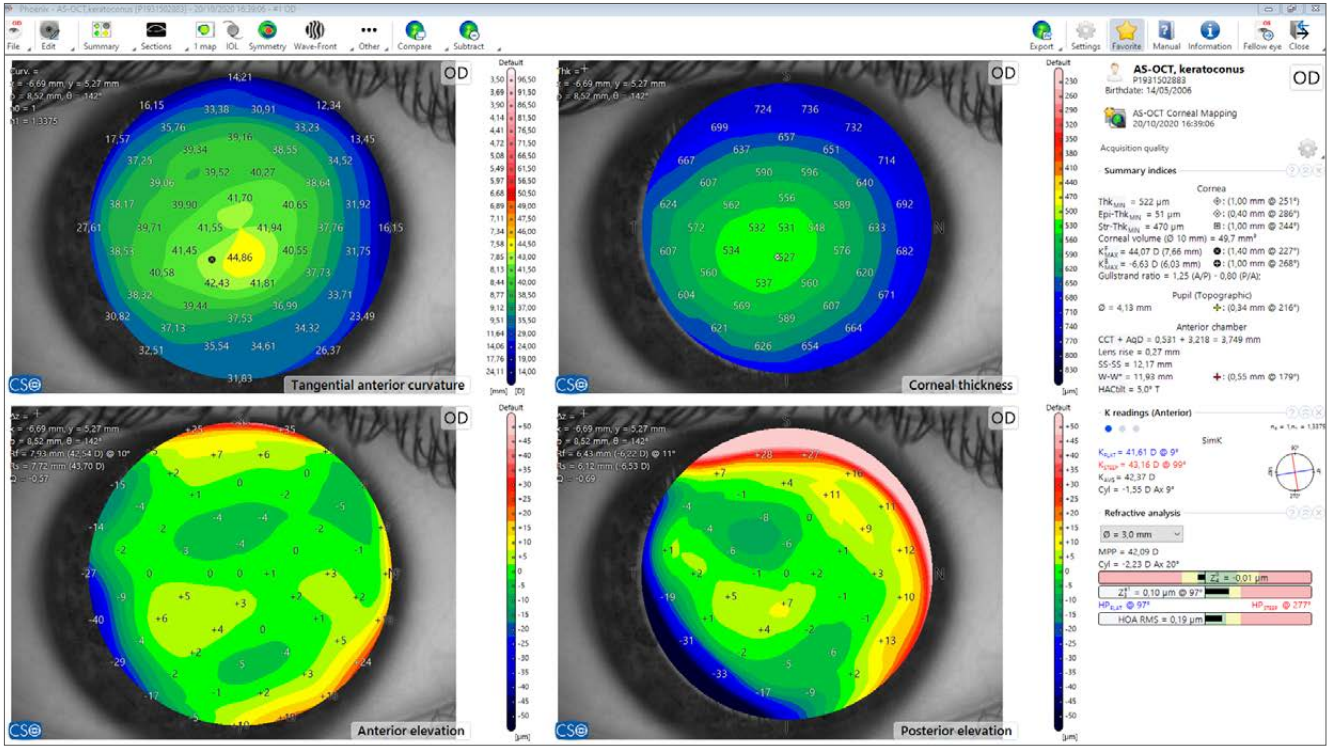
MS

MS-39

MS-39 is an advanced device for the analysis of the anterior segment of the eye.

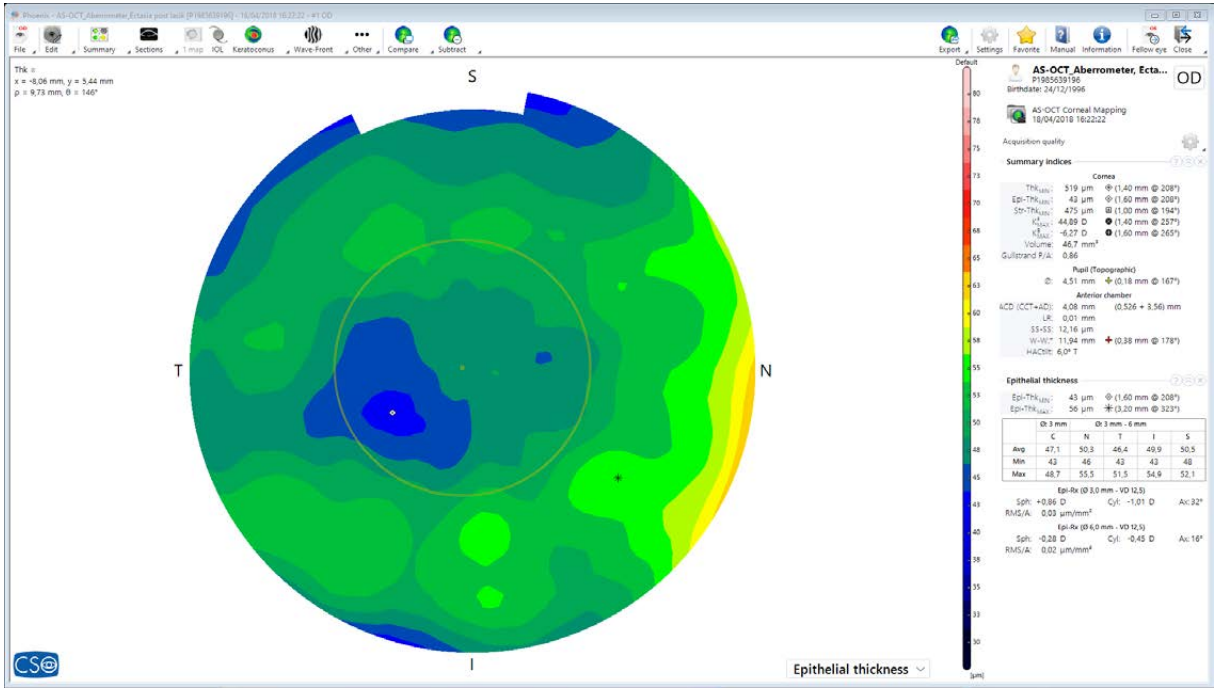
It combines Placido disc corneal topography with OCT-based anterior segment tomography to provide 16 mm diameter cross-sectional images, detailed views of the corneal structure and layers with a resolution of 3.6 µm in tissue and advanced topographic representations of the anterior segment of the eye.

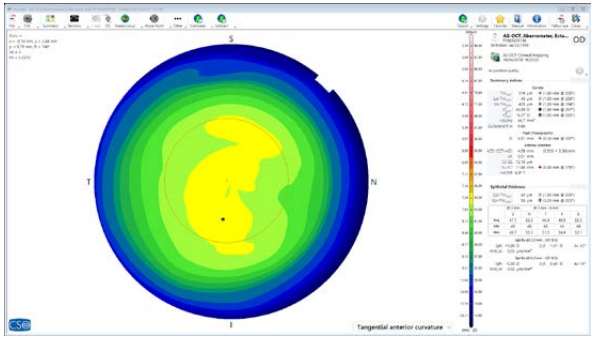
Additionally, the **MS-39** features pupil diameter measurement, Meibomian gland loss analysis and tear film stability assessment.

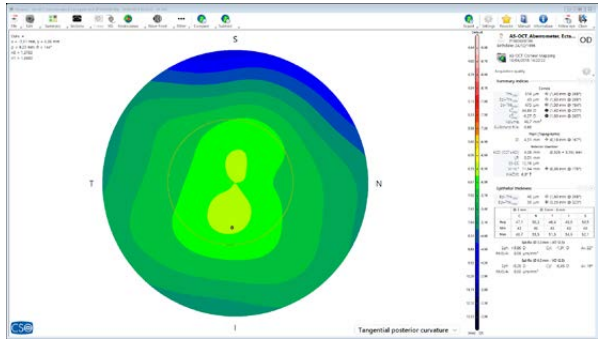


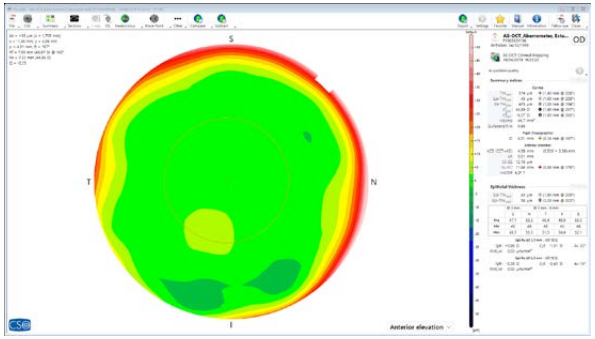
CORNEAL TOPOGRAPHY

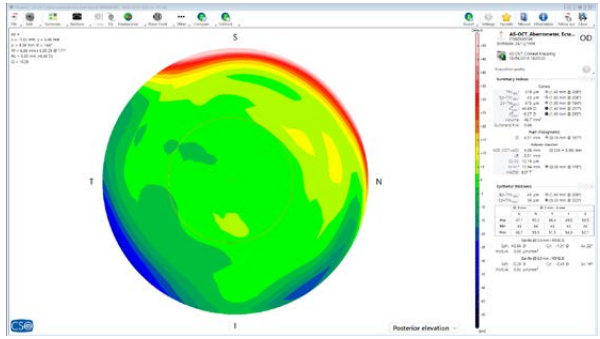
The AS-OCT corneal mapping modality is designed to acquire, in a single scan, a comprehensive set of biometric measurements of the anterior segment of the eye. The measurements are presented as topographic maps and indices and are integrated into diagnostic reports for conditions such as keratoconus and glaucoma, as well as for wavefront analysis and intrastromal corneal ring surgery planning.











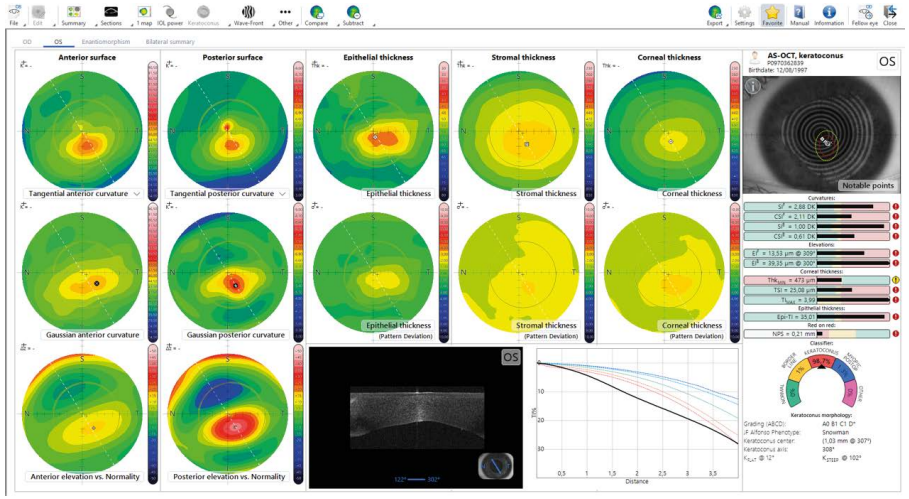
EPITHELIAL THICKNESS MAP

The epithelial thickness map plays a key role in detecting and diagnosing subtle corneal abnormalities and diseases, guiding surgery decisions and monitoring the effectiveness of therapeutic interventions.

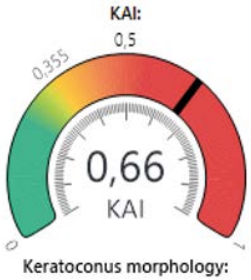
KERATOCONUS SUMMARY

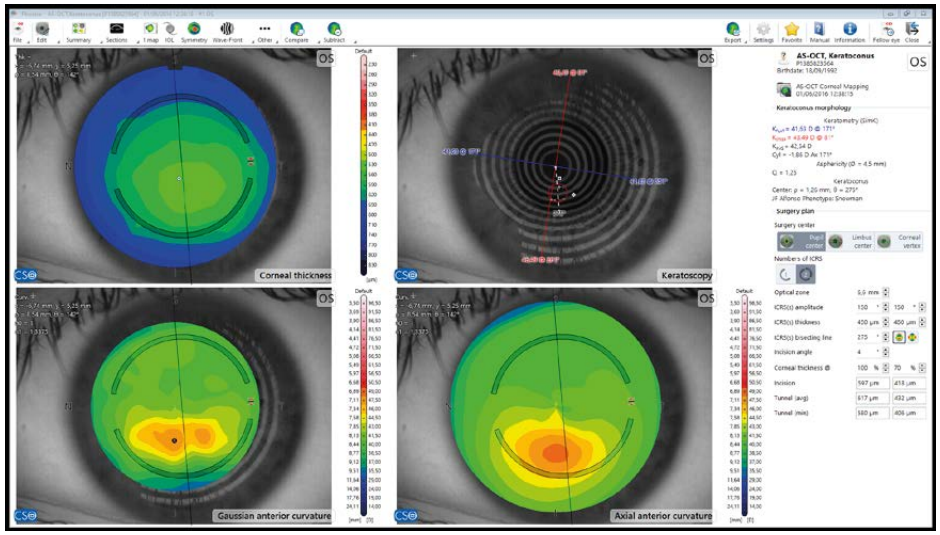
A comprehensive summary of the most representative corneal maps is provided, including anterior and posterior curvature and elevation, corneal, stromal, and epithelial thickness maps, as well as advanced indices for detecting corneal ectasias. Keratoconus summary assists the surgeon in classifying corneal conditions to determine the patient's eligibility for refractive surgery.

Some of these features may not be available in the U.S. market



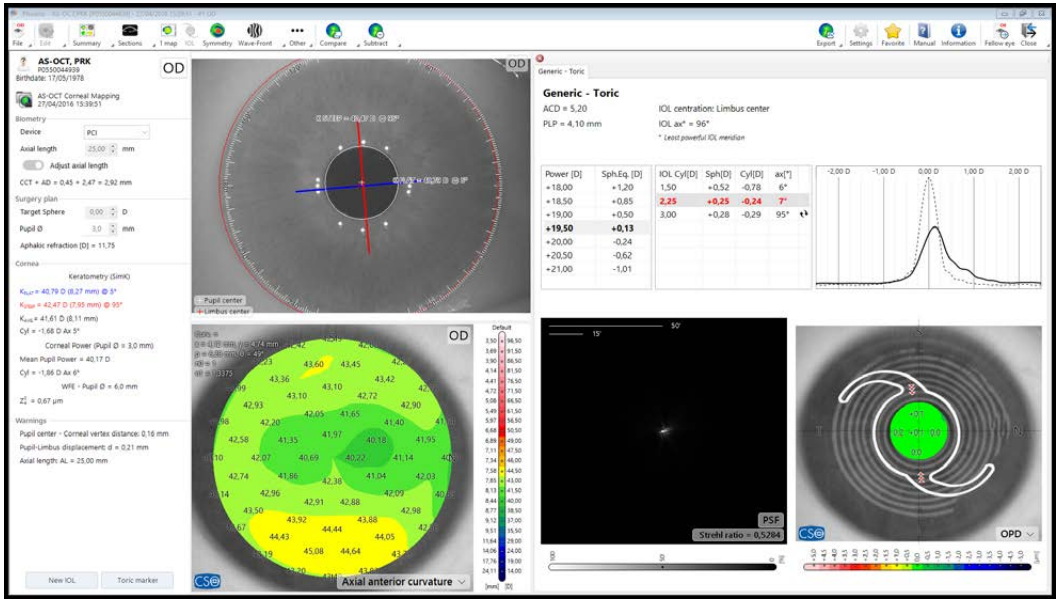
• KAI index: The KAI Index integrates all relevant morphometric parameters for keratoconus detection into a single, comprehensive metric, providing a reliable assessment of corneal compatibility with keratoconus.





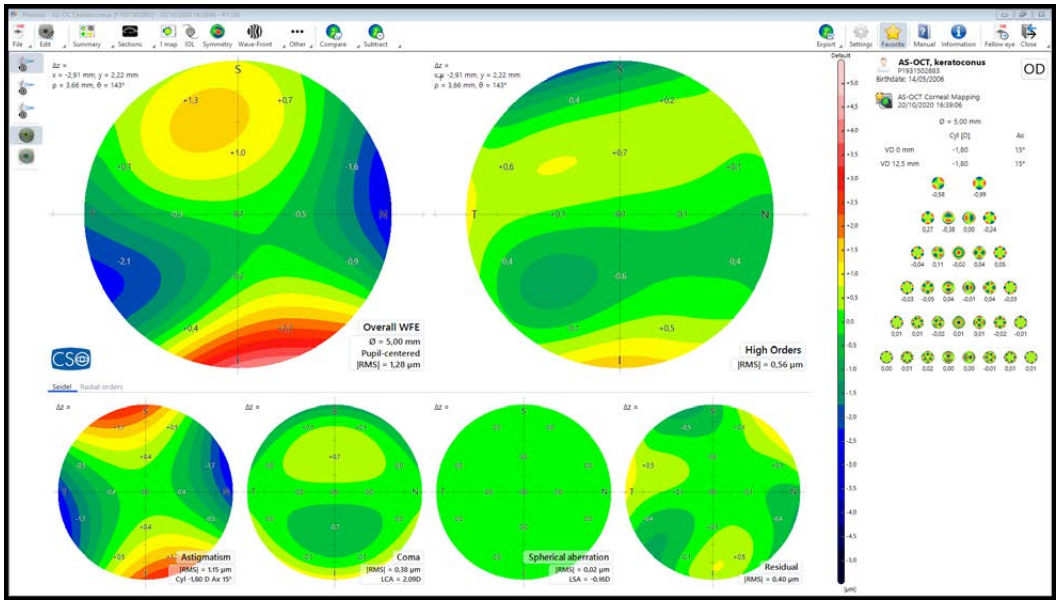
INTRASTROMAL CORNEAL RING SEGMENTS SUMMARY

Based on corneal morphological parameters, MS-39 helps in the planning for intrastromal corneal ring segment surgery, providing with important information about the selection of incision angle, ring amplitude, thickness and centration.



RAY TRACING BASED IOL CALCULATOR

Ray tracing based IOL calculation provides highly accurate measurements of intraocular lens power by simulating the path of light through the eye's optical structures. Unlike traditional methods, ray tracing considers the anatomical and optical properties of each eye, including possible irregularities or changes resulting from previous refractive surgeries

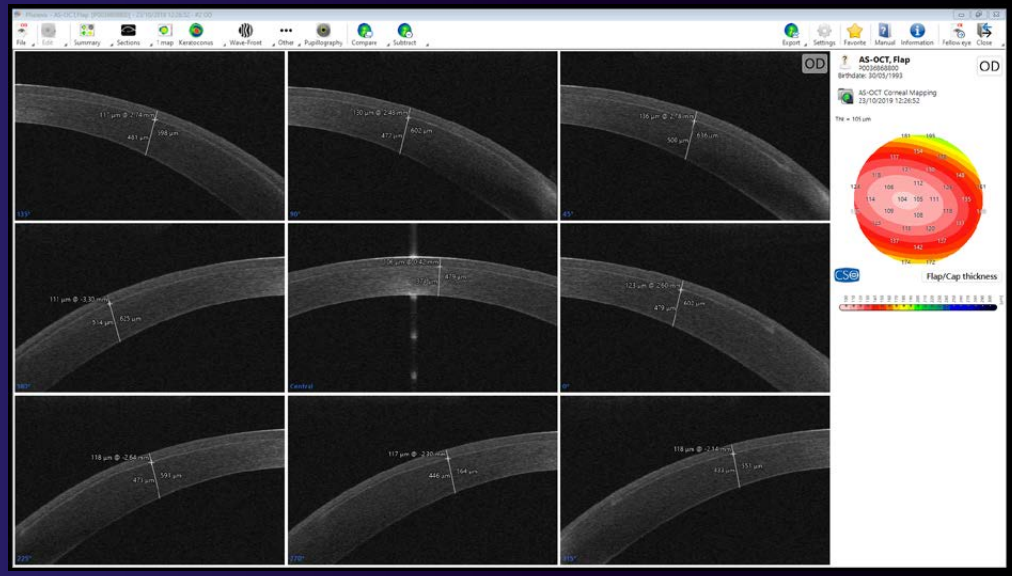


CORNEAL ABERROMETRY AND OPTICAL QUALITY SUMMARY

The aberrometric analysis of the anterior, posterior, the total corneal surfaces and the solely epithelial layer uses Zernike polynomials to comprehensively assess wavefront abnormalities across various simulated pupil diameters. Additionally, MS-39 provides valuable insights into the optical quality of the cornea through parameters such as Point Spread Function (PSF), Modulation Transfer Function (MTF), and simulated visual acuity

REINSTEIN'S FLAP/ CAP DISPLAY

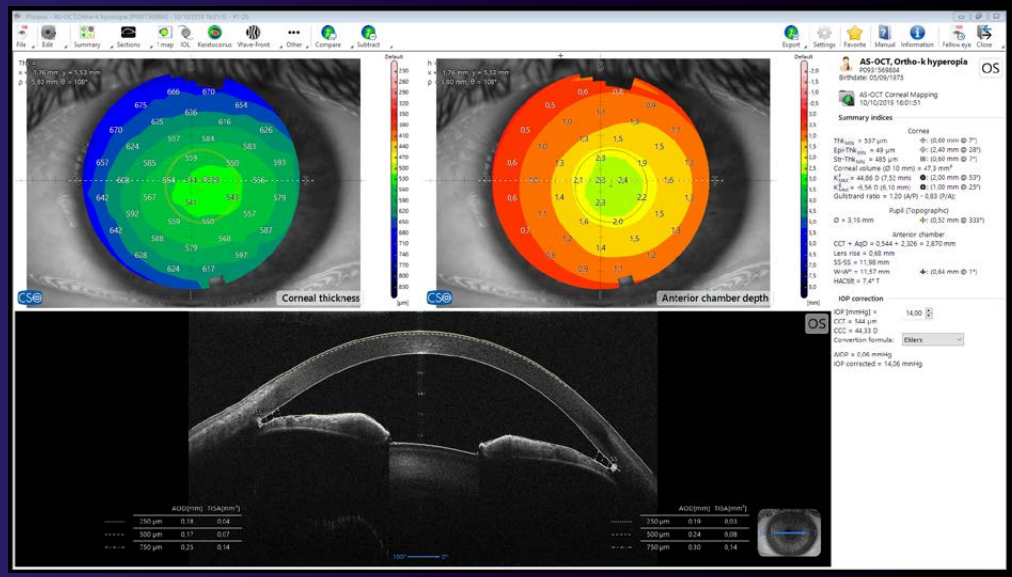
This display provides a detailed assessment of flap/cap regularity, including minimum and maximum depths, assisting refractive surgeons in planning enhancement procedures, further flap cuts, and residual stromal thickness

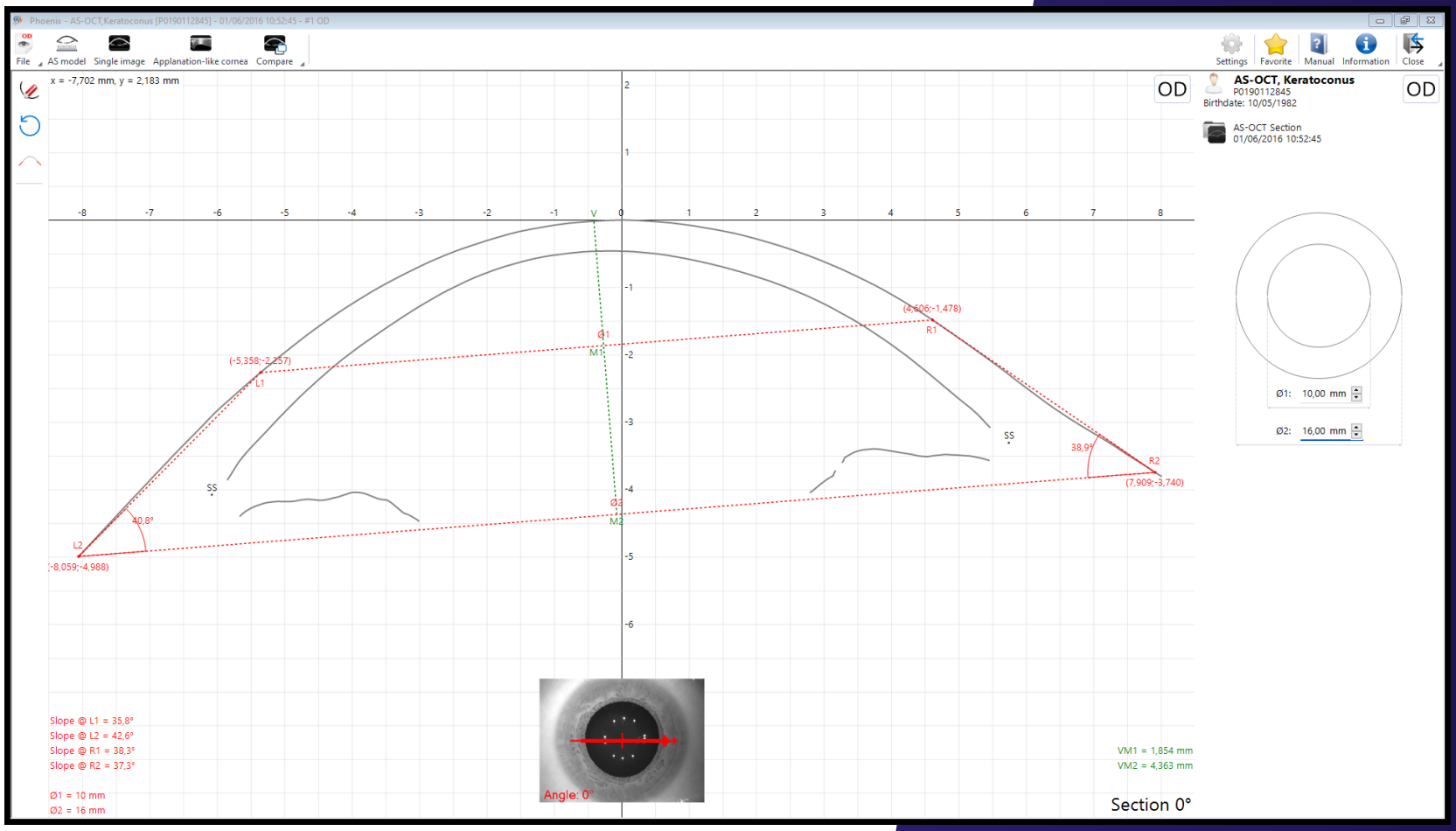


GLAUCOMA SUMMARY

The wide AS-OCT sections along the 360° allow for corneal thickness evaluation, anterior chamber depth assessment and anterior chamber angle measurement by AOD and TISA parameters supporting the diagnosis of glaucoma

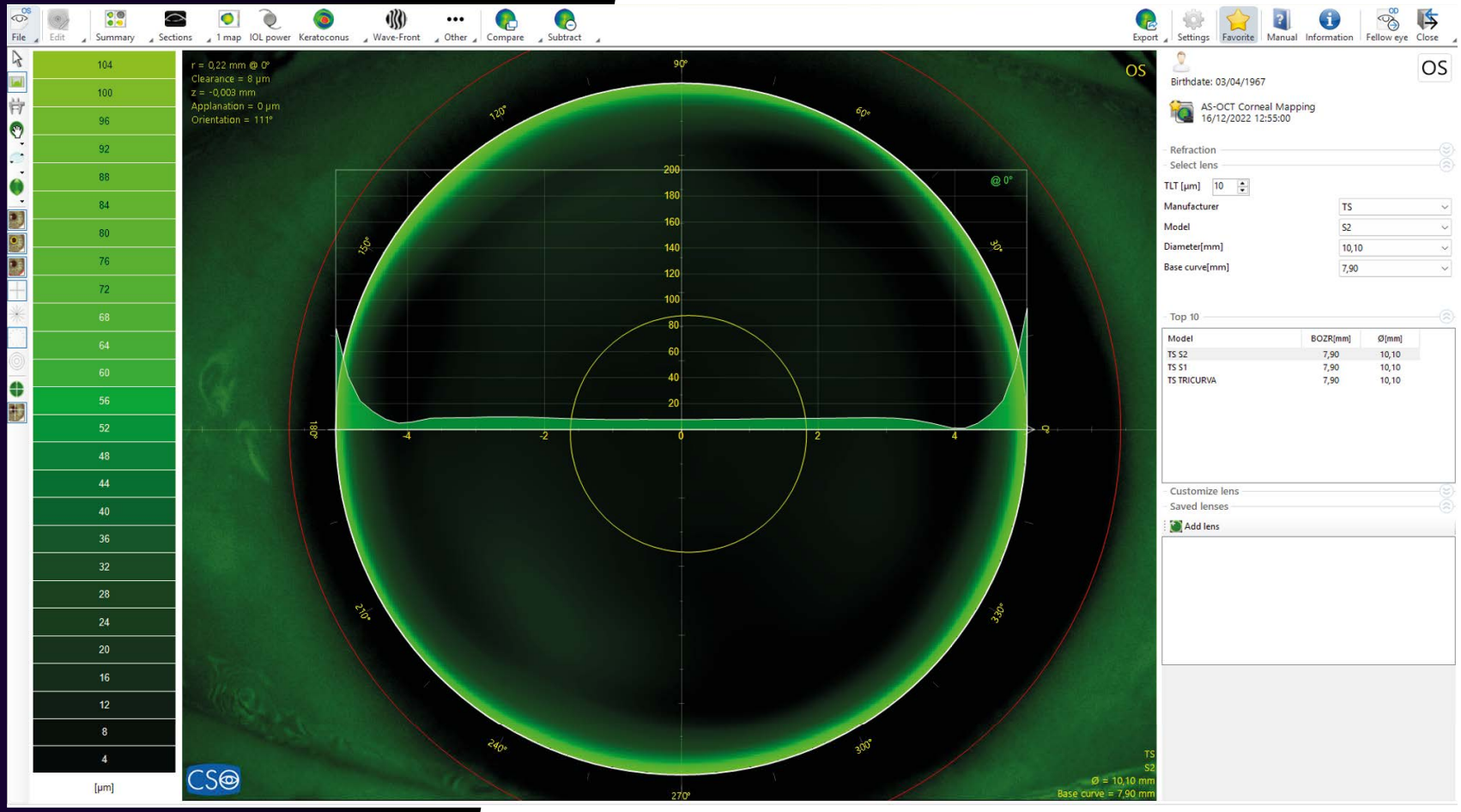
This feature is not available in the U.S. market





SCLERAL LENSES MODULE

Anterior chamber morphological parameters, such as corneal sagittal depth and the slope of corneal and scleral reference points, are depicted in a 2D schematic summary to assist contact lens specialists in the selection or in the design of the most appropriate scleral lens

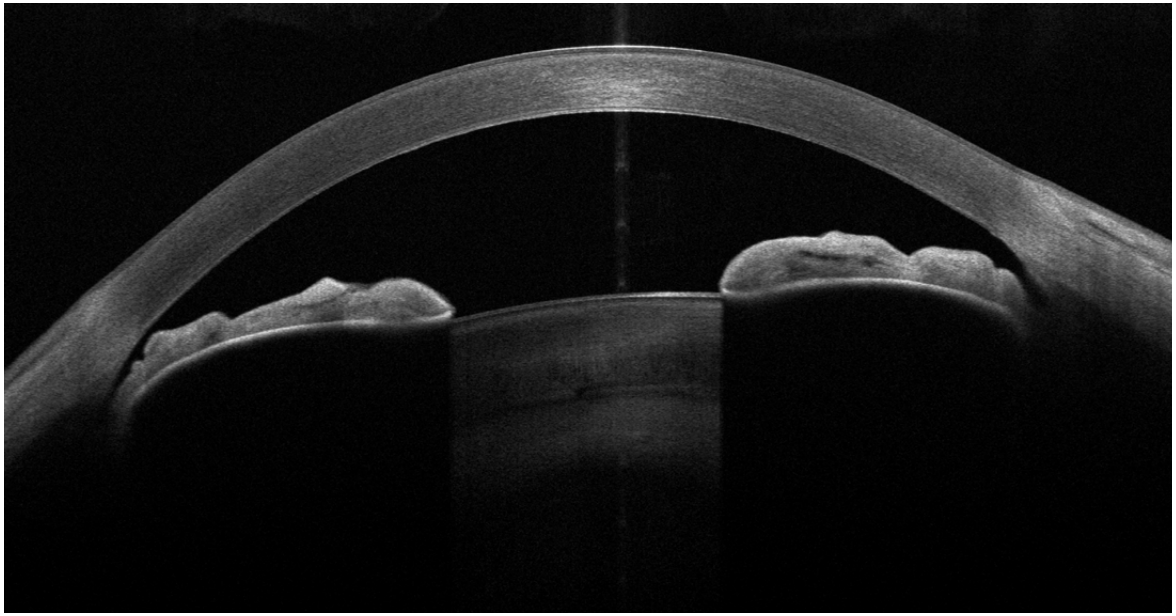


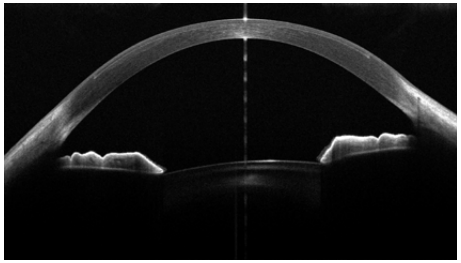
CONTACT LENSES FITTING

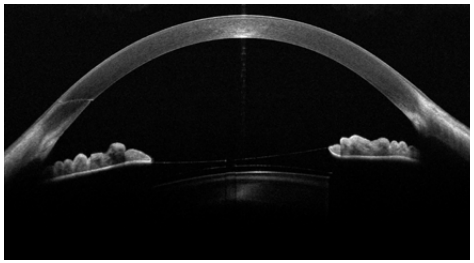
Contact Lens fitting summary assists the user in the selection of the most appropriate RGP (Rigid Gas Permeable) lens according to the corneal shape of the patient

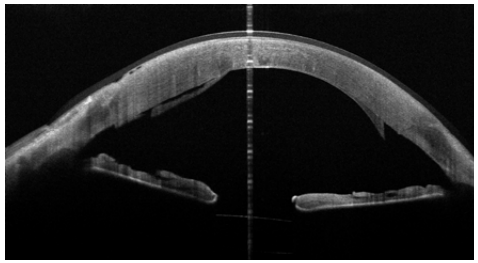
ANTERIOR SEGMENT OCT SECTIONS

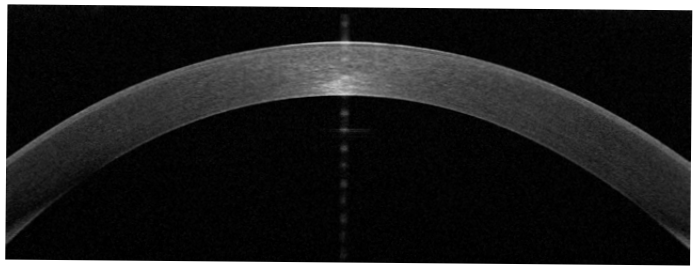
The AS-OCT sections modality enables the acquisition of high-resolution tomographic sections for diagnostic purposes. Various scanning patterns can be used to obtain cross-sectional images, which are essential for monitoring anterior segment surgeries and for supporting contact lens applications. Both manual and automatic calipers can then be used to quantitatively assess the anatomical structures

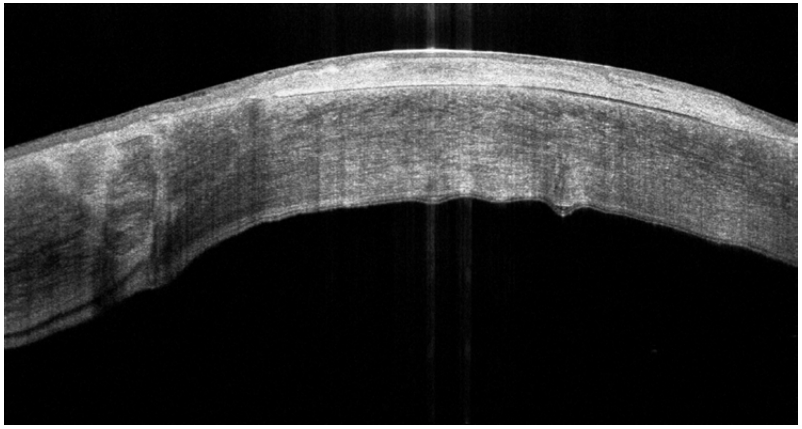


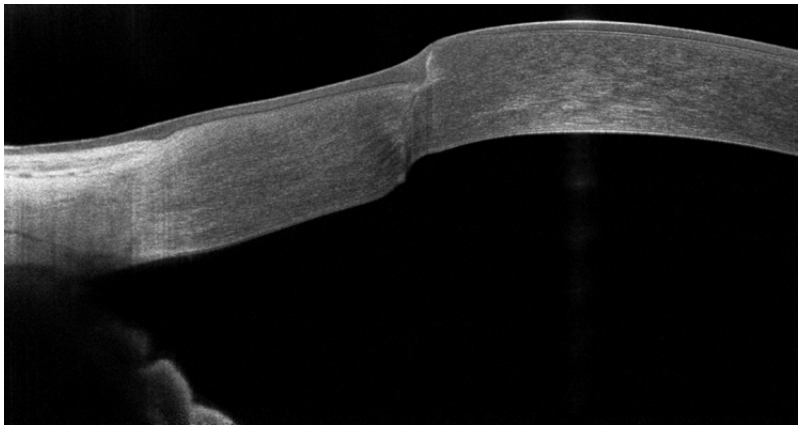








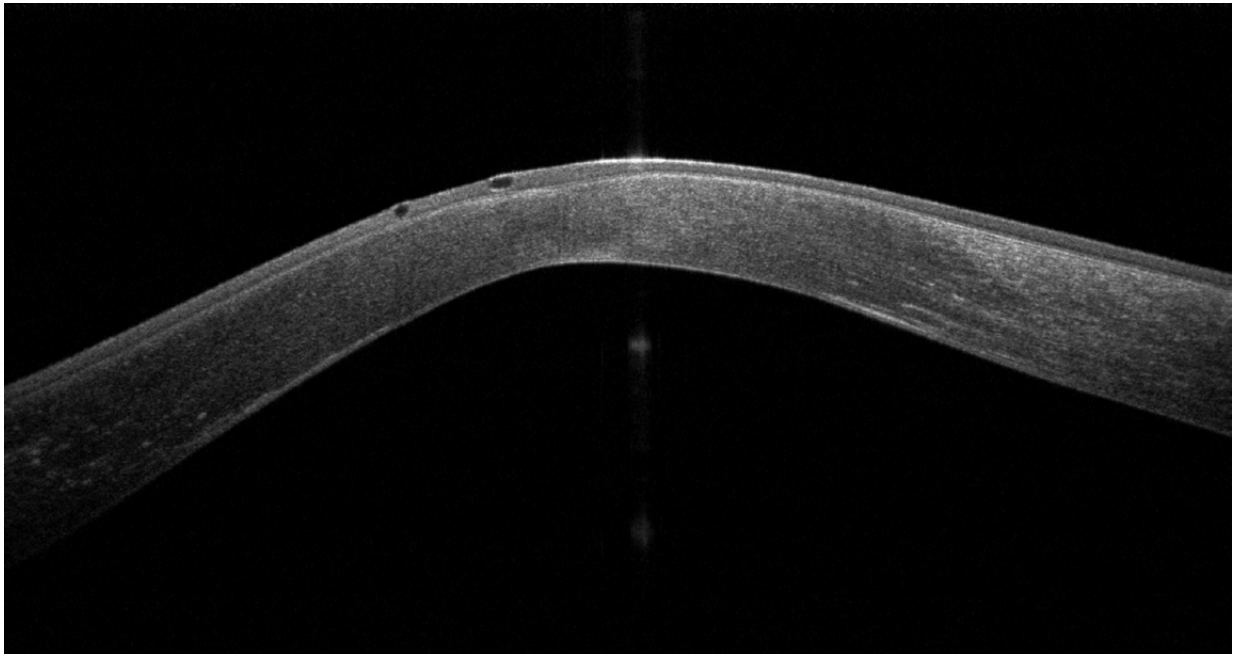




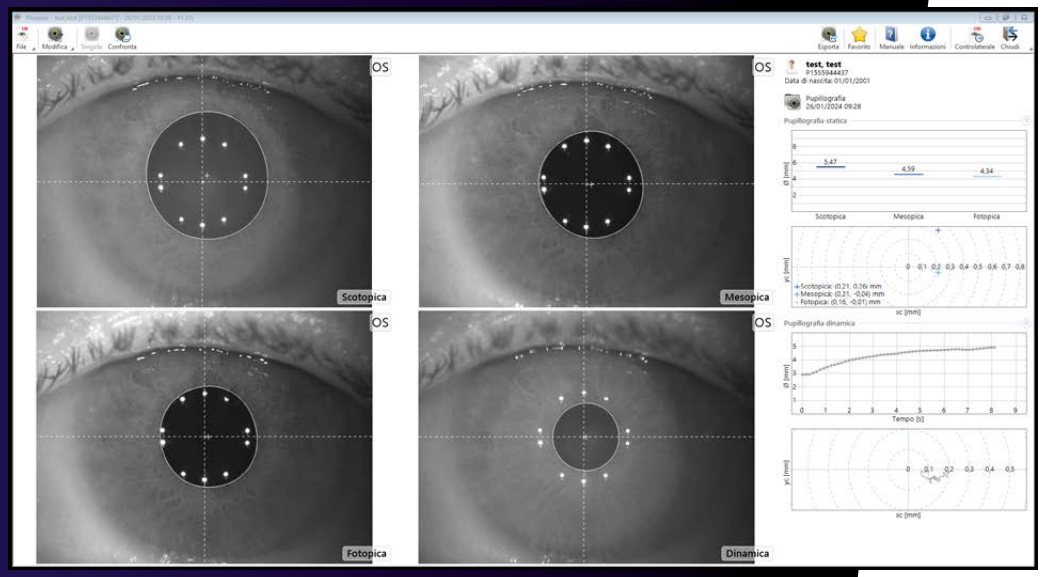
PERICENTRIC ANTERIOR SEGMENT OCT SECTIONS:

Thanks to the Hyperview lens, the MS-39 scans the cornea using a converging, non-telecentric beam geometry, providing high-magnification visualization of corneal microstructures. This enables more detailed preoperative planning and postoperative assessment of corneal layers.

Hyperview lens is not included in the standard configuration

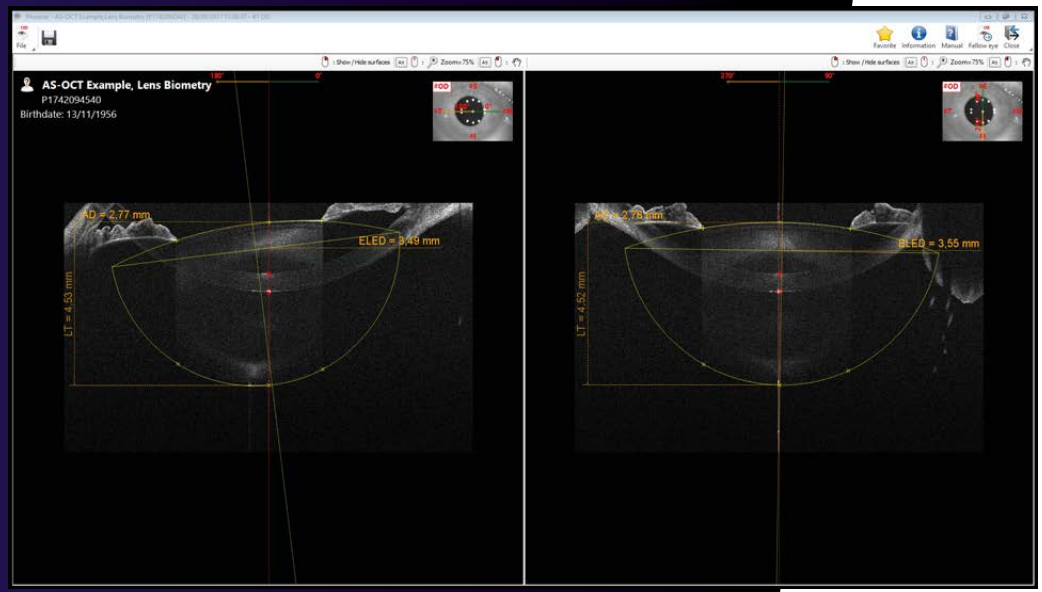



MS-39
Corneal thickness
Tangential anterior curvature
Anterior elevation
Posterior elevation



PUPILLOGRAPHY

The integrated pupillography module allows for the evaluation of pupil diameter under scotopic, mesopic, photopic, and dynamic lighting conditions, providing essential information for many procedures which seek to optimize vision quality



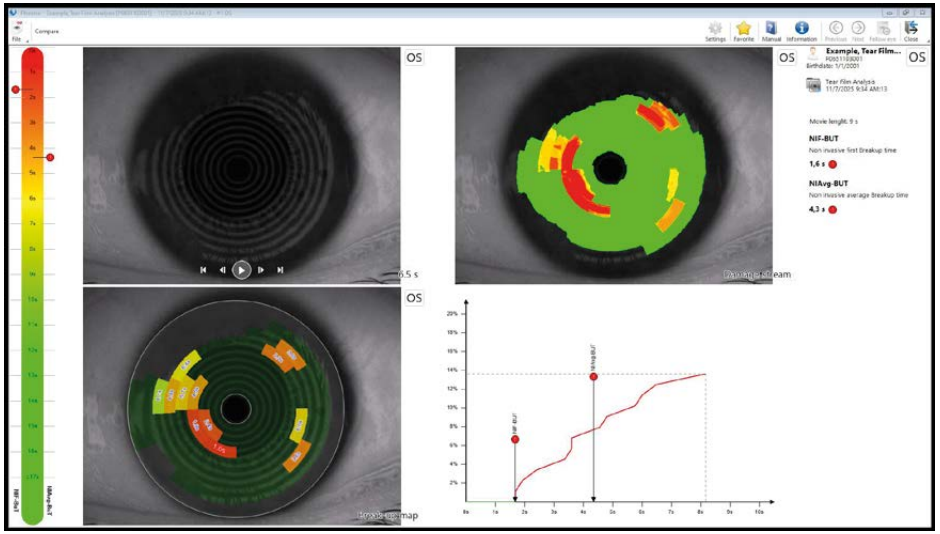
ANTERIOR SEGMENT OCT LENS BIOMETRY

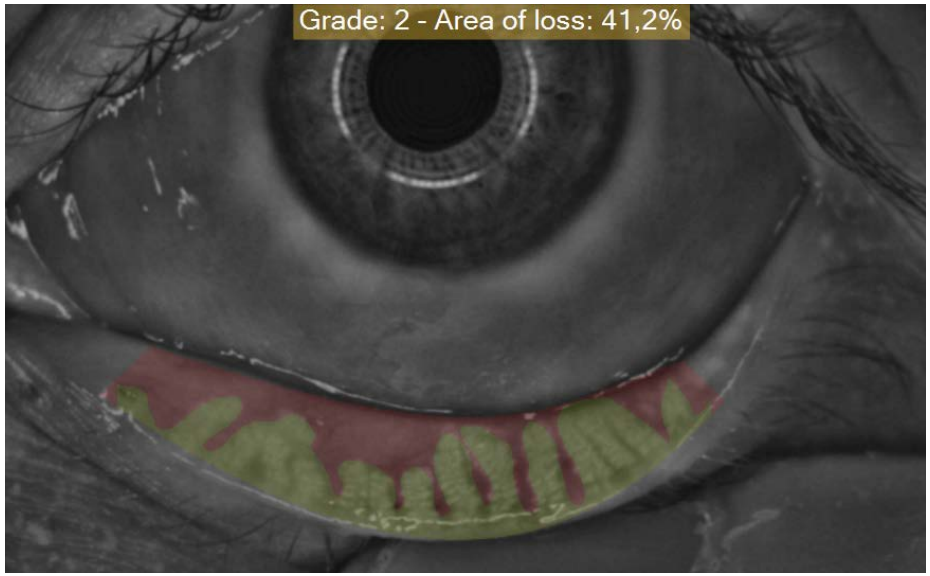
Crystalline lens morphological parameters are required by many intraocular lens (IOL) calculation formulas. Thanks to a fast and easy imaging acquisition system, MS-39 provides the crystalline lens thickness

TEAR FILM ANALYSIS

Based on Placido disc rings reflection, MS-39 is able to evaluate tear film stability through a non-invasive tear film break-up test

This feature is not available in the U.S. market





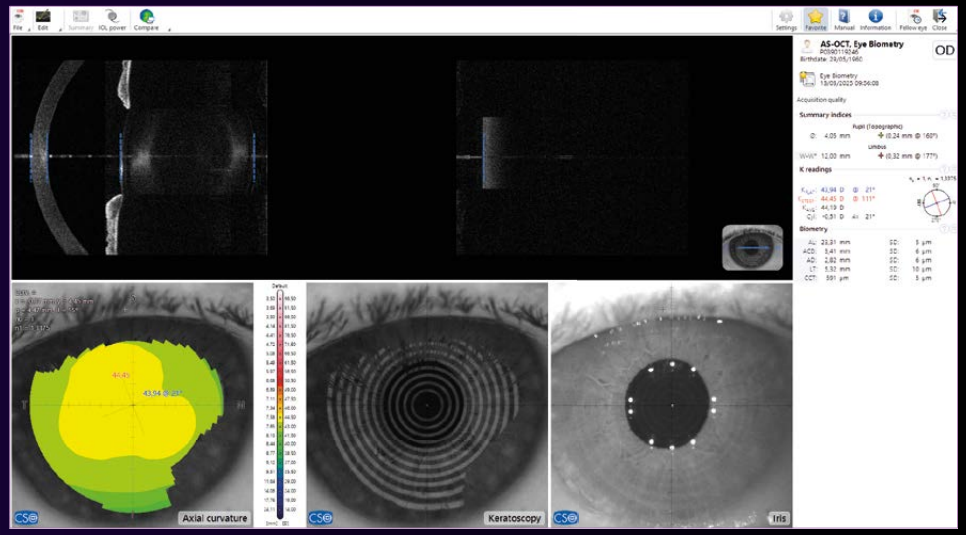
MEIBOGRAPHY

Infrared illumination is used to image the Meibomian glands. Software-based analysis and grading scales assist physicians in assessing Meibomian glands loss. Meibo lens can be used for obtaining a wider field of view

Meibo lens is not included in the standard configuration

OCT-based ocular biometry provides fast, non-contact acquisition of all key parameters required for accurate IOL calculation: axial length, anterior chamber depth, lens thickness, and keratometry (K readings).

IOL power can then be calculated using Kane, EVO v2, PEARL-DGS, and the Hoffer QST suites



Kane suite

A-constant = 119,2
IOL ax = 72°
SIA = 0,25 D (Incision @ 119°)

Keratoconus

IOL [D]	Sph.Eq. [D]
+23,00	+0,92
+23,50	+0,58
+24,00	+0,24
+24,50	**-0,10**
+25,00	-0,45
+25,50	-0,81
+26,00	-1,17

IOL Cyl [D]	Sph [D]	Cyl [D]	Ax [°]
T2 (1.00 D)	+0,10	-0,40	162°
T3 (1.50 D)	**-0,07**	**-0,08**	**162°**
T4 (2.25 D)	+0,10	-0,42	72°
T5 (3.00 D)	+0,35	-0,91	72°
T6 (3.75 D)	+0,60	-1,40	72°

• Kane, Jack X., and Benjamin Connell. "A comparison of the accuracy of 6 modern toric intraocular lens formulas." Ophthalmology 127.11 (2020): 1472-1486.

EVO v2 suite

A-constant = 119,2
IOL ax = 68°
SIA = 0,25 D (Incision @ 119°)

Post Myopic LVC
Post RK
Post Hyperopic LVC
Advanced options

IOL [D]	Sph.Eq. [D]
+23,00	+0,82
+23,50	+0,50
+24,00	+0,18
+24,50	**-0,15**
+25,00	-0,47
+25,50	-0,81
+26,00	-1,14

IOL Cyl [D]	Sph [D]	Cyl [D]	Ax [°]
T2 (1.00 D)	+0,05	-0,37	158°
T3 (1.50 D)	**-0,12**	**-0,04**	**158°**
T4 (2.25 D)	+0,09	-0,46	68°
T5 (3.00 D)	+0,34	-0,95	68°
T6 (3.75 D)	+0,58	-1,44	68°

• Yang, Soonwon, Hyoji Han, and Hyun Soo Lee. "Comparative Accuracy Of Five Modern Toric Intraocular Lens Formulas." American Journal of Ophthalmology 274 (2025): 1-8.
• Anter, Abdelrahman M., et al. "Comparison of legacy and new no-history IOL power calculation formulas in postmyopic laser vision correction eyes." American Journal of Ophthalmology 264 (2024): 44-52.

Acquisition quality

Summary indices

Pupil (Topographic)
Ø: 3,65 mm (+0,14 mm @ 169°)
Limbus
W-W*: 12,08 mm (+0,41 mm @ 178°)

K readings

n_0 = 1, n_1 = 1,3375
K_{FLAT}: 40,96 D @ 170°
K_{STEEP}: 42,73 D @ 80°
K_{AVG}: 41,82 D
Cyl: -1,77 D Ax 170°

Biometry

AL:	23,35 mm	SD:	5 µm
ACD:	3,40 mm	SD:	8 µm
AD:	2,87 mm	SD:	8 µm
LT:	4,13 mm	SD:	13 µm
CCT:	539 µm	SD:	5 µm

PEARL-DGS

A-constant = 119,2

Post LVC
Post RK
Non-physiological

IOL [D]	Sph.Eq. [D]
+23,00	+0,70
+23,50	+0,36
+24,00	+0,02
+24,50	**-0,33**
+25,00	-0,68
+25,50	-1,03
+26,00	-1,38

• Debellemanière, Guillaume, et al. "The PEARL-DGS formula: the development of an open-source machine learning–based thick IOL calculation formula." American Journal of Ophthalmology 232 (2021): 58-69.

Hoffer QST suite

pACD-constant = 5,6
IOL ax = 74°
SIA = 0,25 D (Incision @ 119°)

IOL [D]	Sph.Eq. [D]
+23,00	+0,77
+23,50	+0,43
+24,00	+0,09
+24,50	**-0,26**
+25,00	-0,61
+25,50	-0,96
+26,00	-1,32

IOL Cyl [D]	Sph [D]	Cyl [D]	Ax [°]
T2 (1.00 D)	-0,04	-0,44	164°
T3 (1.50 D)	**-0,21**	**-0,09**	**164°**
T4 (2.25 D)	-0,05	-0,42	74°
T5 (3.00 D)	+0,21	-0,94	74°
T6 (3.75 D)	+0,47	-1,46	74°

• Taroni, Leonardo, et al. "Comparison of the new Hoffer QST with 4 modern accurate formulas." Journal of Cataract & Refractive Surgery 49.4 (2023): 378-384.

This feature is not included in the standard configuration and it is not available in the U.S. market

ACCESSORIES

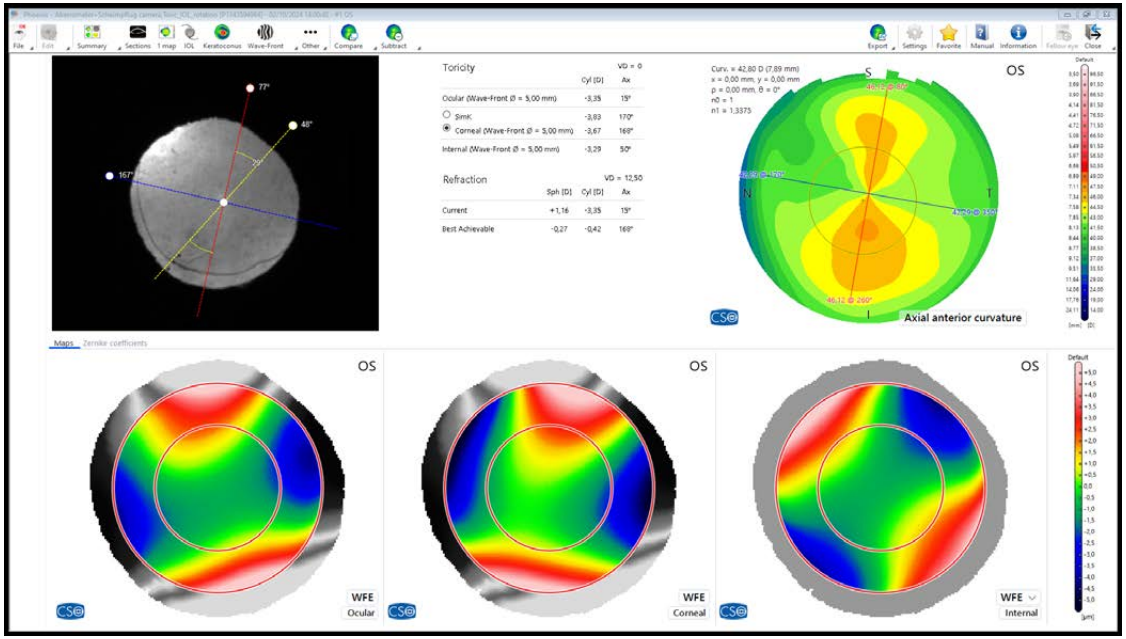
Meibo lens: Thanks to its magnetic positioning system, the Meibo Lens can be quickly and securely attached to the front of the OCT optics and removed just as easily. It expands the field of view during meibography examinations, enabling a more comprehensive visualization of the meibomian glands

Hyperview lens: Featuring the same magnetic positioning system as the Meibo Lens, the Hyperview Lens can be easily attached and removed without interrupting the workflow. It is required for acquiring pericentric anterior segment OCT scans


MS-39
AS-OCT
CSO

PHOENIX INTEGRATION

Phoenix application software allows for MS-39 management and for the integration of all CSO devices into a single platform for a shared storage of patients and exams. Phoenix facilitates the analysis, comparison, and follow-up of patients' clinical conditions and merges data from different CSO devices to create combined diagnostic summaries.



MS-39 Anterior segment OCT,
in combination with the ocular aberrometer Osiris:
By combining the ocular wavefront measured with Osiris and the corneal wavefront acquired with MS-39, Phoenix calculates the corneal, internal, and residual refractive astigmatism, enabling the Toric IOL Assistant.

Designed for the postoperative assessment of toric IOL implantation, the Toric IOL Assistant determines the optimal toric IOL rotation axis when the achieved astigmatic outcome differs from the intended target, helping maximize astigmatic correction and optimize postoperative visual outcomes.


MS-39
Osiris
Axial anterior curvature
OS
WFE
Ocular
WFE
Corneal
WFE
Internal

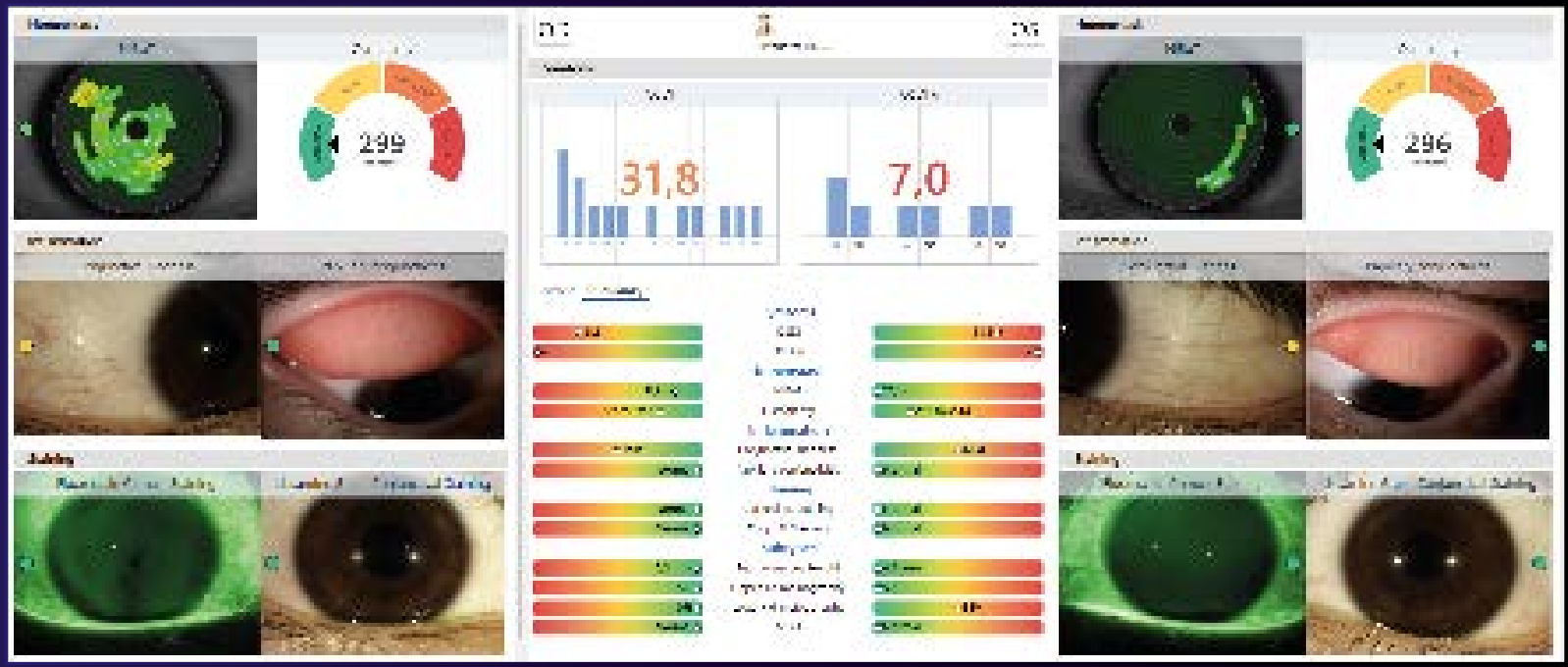
MS-39 Anterior segment OCT, in combination with other CSO devices

Enables the evaluation and classification of dry eye disease according to the DEWS III criteria (Dry Eye Workshop III) through a wide range of tear film tests

	Antares+	Sirius+	MS-39	Osiris-t	SL9900_99K ELITE	SL9900_99K with Mizar camera
OSDI questionnnaire	✓	✓	✓	✓	✓	✓
NIBut	✓	✓	✓ *	✓	✗	✗
Conjunctival redness	✓	✓	✗	✗	✓	✓
Papillary conjunctivitis	✓	✓	✗	✗	✓	✓
Corneal fluorescein staining	✓	✓	✗	✗	✓	✓
Conjunctival lissammine green staining	✓	✓	✗	✗	✓	✓
Lid Wiper	✓	✓	✗	✗	✓	✓
Meibomian glands ducts analysis	✓	✓	✗	✗	✓	✓
Meibography	✓	✓	✓	✗	✓	✗
Lipid layer interferometry	✓ It requires the Placido light diffuser	✓	✗	✗	✓ It requires Polaris	✓ It requires Polaris
Tear meniscus height	✓	✓	✗	✗	✓	✓
Blink rate	✓	✗	✗	✗	✗	✗
Osmolarity To be Imported by 3° party devices	✓	✓	✓	✓	✓	✓
MMP-9 To be Imported by 3° party devices	✓	✓	✓	✓	✓	✓
IgE To be Imported by 3° party devices	✓	✓	✓	✓	✓	✓
LT-α To be Imported by 3° party devices	✓	✓	✓	✓	✓	✓

** This feature is not available in the U.S. market*


OD
OS
NIBUT
Osmolarity
299
296
31,8
7,0
Symptoms
Staining
Fluorescein Corneal Staining
Lissamine Green Conjunctival Staining


299
296
31,8
7,0

TECHNICAL DATA	
Data transfer	USB 3.0
Power supply	external power source 24 VDC In: 100-240Vac - 50/60Hz - 2A - Out: 24Vdc - 100W
Power cable	IEC C14 plug
Dimensions (HxWxD)	511 x 315 x 259mm
Weight	11.2 Kg
Chin rest movement	70mm ± 1mm
Minimum height of the chin cup from table	23cm
Base movement (xyz)	105 x 110 x 30mm
Working distance:	74mm
LIGHT SOURCES	
Placido disk	LED @635nm
OCT source	SLED @845nm
Pupillography and Meibography	LED @950nm
TOPOGRAPHY	
Placido disk rings	22
Measured points	up to 69632 (anterior surface) up to 64000 (posterior surface)
Topographic covering	10 mm
ISO 19980; 2021	Compliant Class A
SECTION	
Image field	16mm x 8mm
Axial resolution	3.6 µm (in tissue)
Transversal resolution	35 µm (in air)

BIOMETRY	
Axial length	14–35 mm
Axial length (repeatability)	<20 µm (test-retest)
Aqueous Depth	0.5–8 mm
Aqueous Depth (repeatability)	<35 µm (test-retest)
Lens Thickness	0.1–5.6 mm
Lens Thickness (repeatability)	<80 µm (test-retest)
Central Corneal Thickness	0.2–1.2 mm
Central Corneal Thickness (repeatability)	<11 µm (test-retest)
ISO-22665-2012	compliant
KERATOMETRY	
K-readings	5-10 mm
Whito to White	8–15.5 mm
ISO 10343;2014	compliant
IOL FORMULAE	
IOL calculation formulae	Kane, EVO v.2, PEARL-DGS, Hoffer QST suites
ACCESSORIES	
Meibo lens	
Hyperview lens	
DICOM	
DICOM Version 3 ; IHE integration profile: Unified Eye Care Workflow (Eye Care Image, Broad Worklist Query, Patient Based Worklist Query, Encapsulated PDF Option for Evidence Documents, Imaging Procedure Status Update (DICOM), Procedure Status Tracking (DICOM MPPS) Option	

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