Stratus OCT™ with Software Version 5.0

Real Answers in Real Time

ZEISS

Stratus OCT™ — The standard of care system for comprehensive retina and glaucoma management.

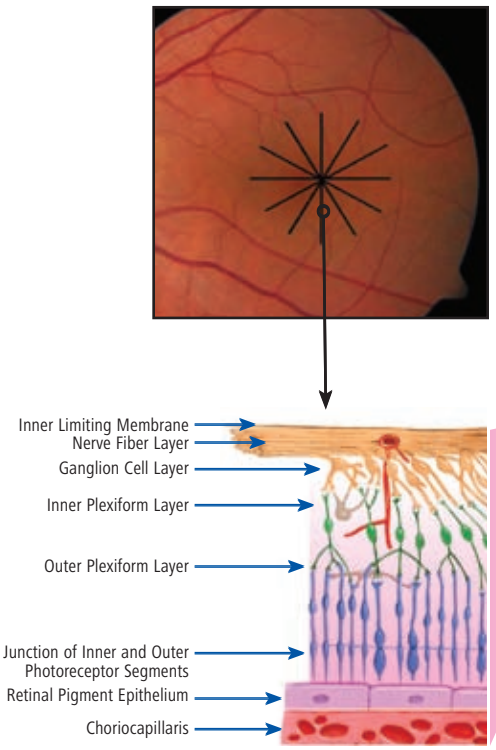
Visualize virtual histology. High resolution cross-sectional imaging for the comprehensive management of glaucoma and retinal disease.

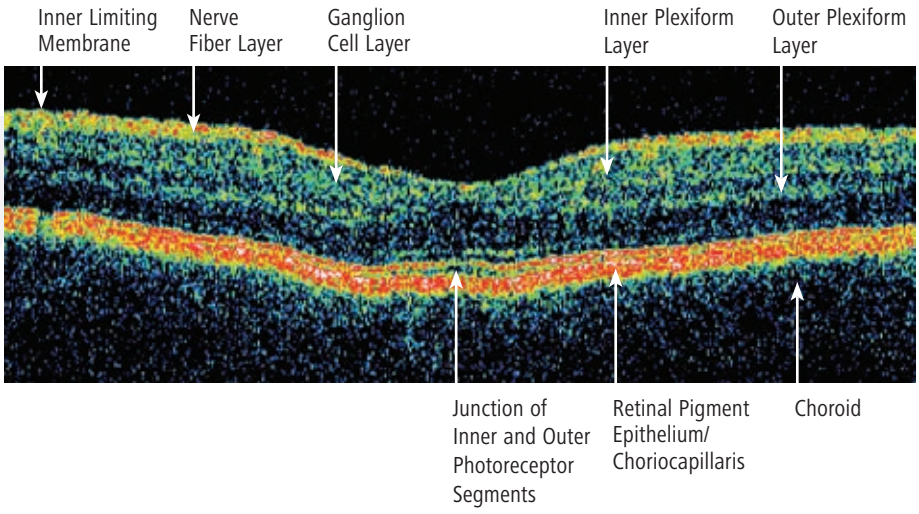
Assess RNFL change. GPA Advanced Serial Analysis reports statistically significant change and rate of change in RNFL thickness.

Expand your clinical confidence. Most extensive library of clinical studies in the industry and over 8000 systems installed worldwide.

Offer comprehensive care. Valuable for pre- and post-op cataract patients to identify and illustrate cause of poor vision.

Increase practice productivity. Operate the full analysis capabilities from the lane, your office or a remote location.

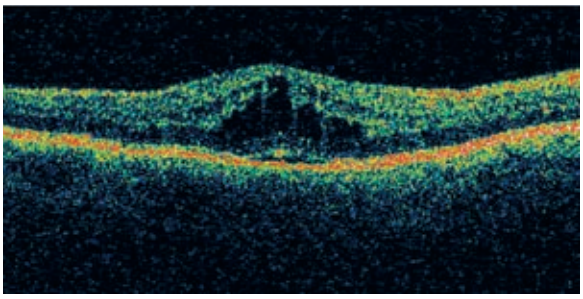




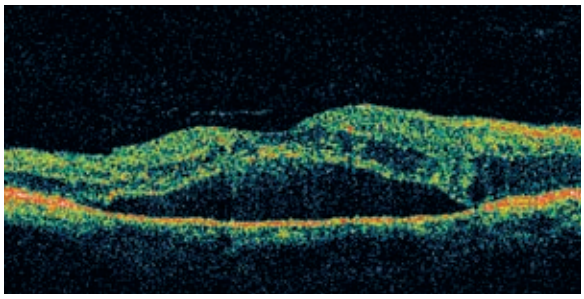
In the Stratus OCT image display, retinal layers with the highest reflectivity appear red. In a healthy retina, these include the nerve fiber layer, retinal pigment epithelium and choriocapillaris. The layers that exhibit minimal reflectivity appear blue or black, such as the photoreceptor layer, choroid, vitreous fluid or blood.

Obtain real-time non-invasive histology of live tissue

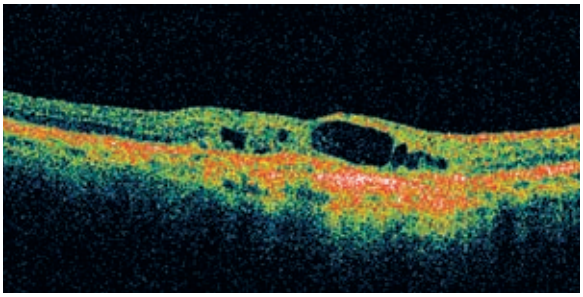
Stratus OCT reveals the retinal layers in high-resolution, cross-sectional views, offering insight for diagnosis, therapy and ongoing management of retinal disorders.



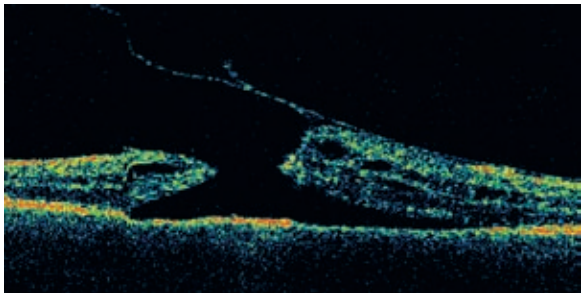
Cystoid Macular Edema



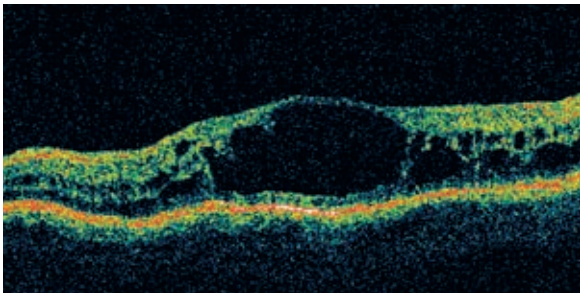
Central Serous Chorioretinopathy



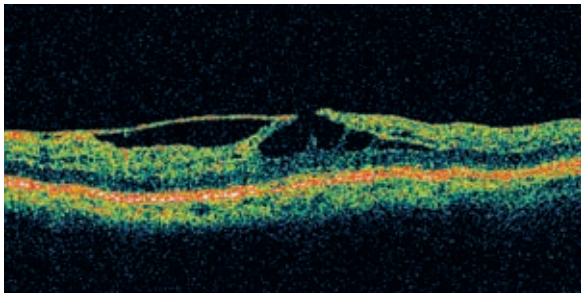
Age-related Macular Degeneration
with Overlying Cystoid Macular Edema



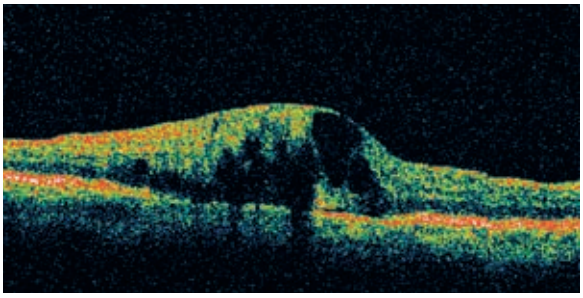
Macular Hole with Operculum



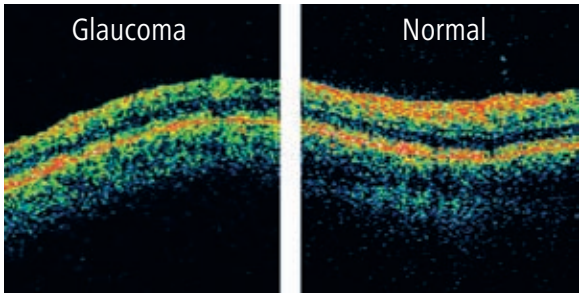
Diabetic Macular Edema



Epiretinal Membrane with Lamellar Hole
and Cystoid Macular Edema

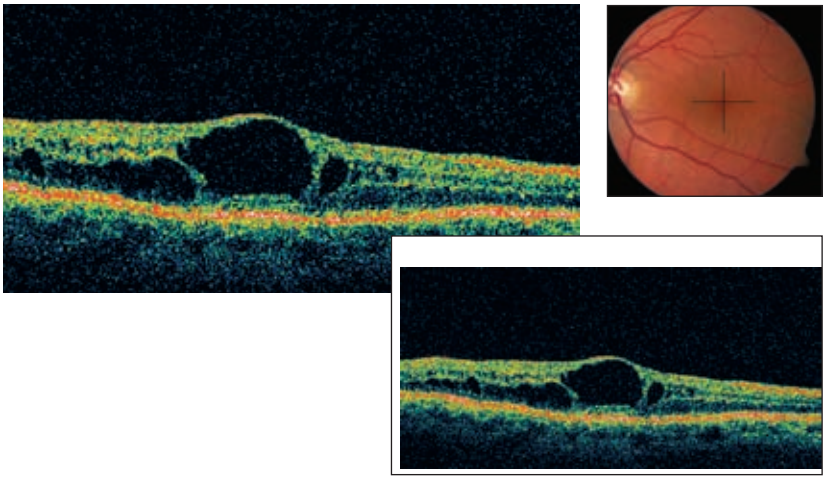


Branch Retinal Vein Occlusion



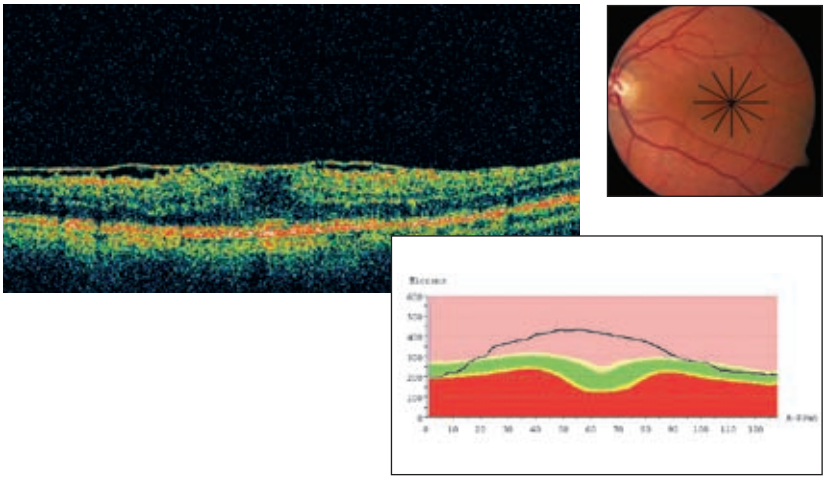
RNFL Loss

Visualize and analyze retinal disorders



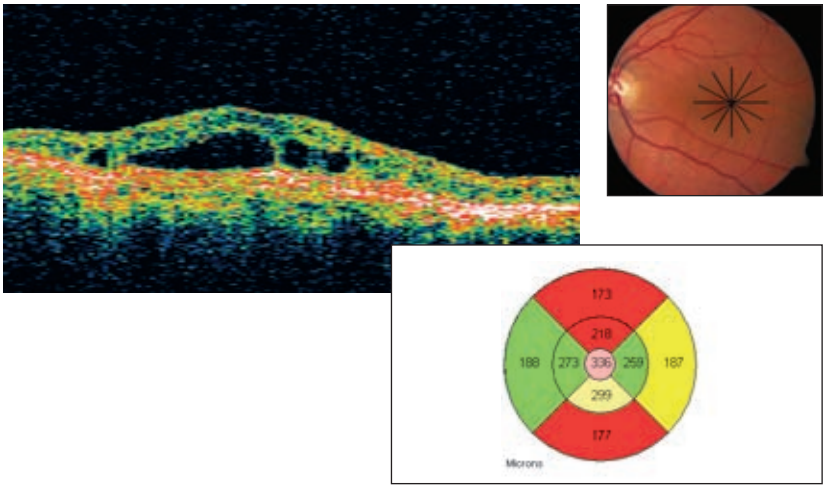
Diabetic Retinopathy

- Stratus OCT reveals and measures diffuse macular thickening and loss of foveal contour
- Intraretinal cysts and fluid accumulation are identifiable as areas of low reflectivity in the cross-sectional scan
- Post-treatment resolution of retinal thickening can be quantified and monitored



Epiretinal Membrane

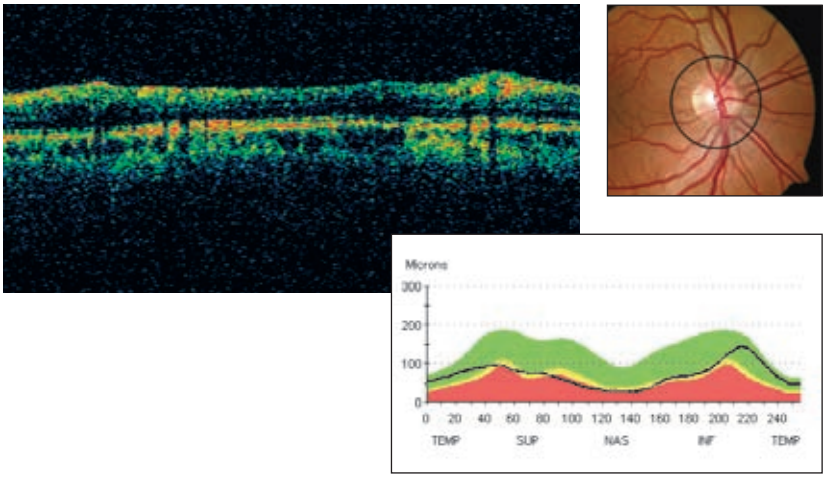
- Stratus OCT scan shows the epiretinal membrane as a highly reflective band on the inner retinal surface
- Separation of the membrane from the retina is visible in areas
- Underlying retina is thickened, with loss of normal foveal contour



Age-related Macular Degeneration

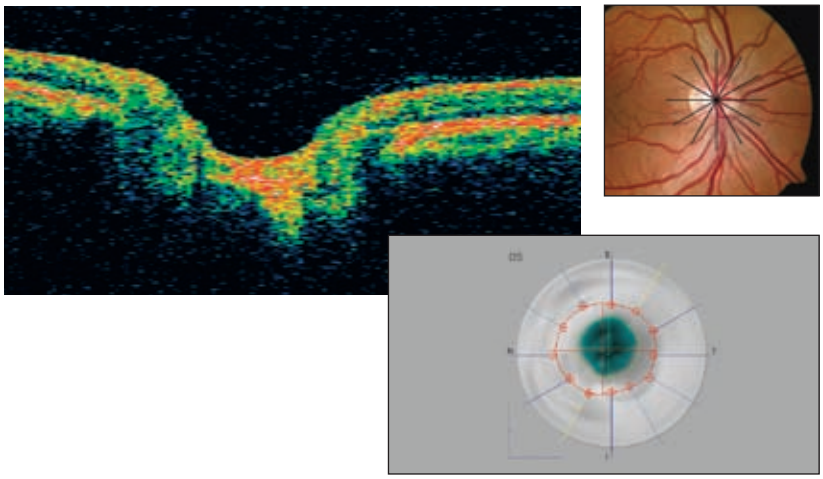
- Disruption of RPE, caused by neovascularization and drusen, can be visualized
- Pockets of interretinal fluid are visible as areas of reduced reflectivity
- Structural changes resulting from therapy can be quantified and monitored

Detect glaucoma damage at an earlier stage



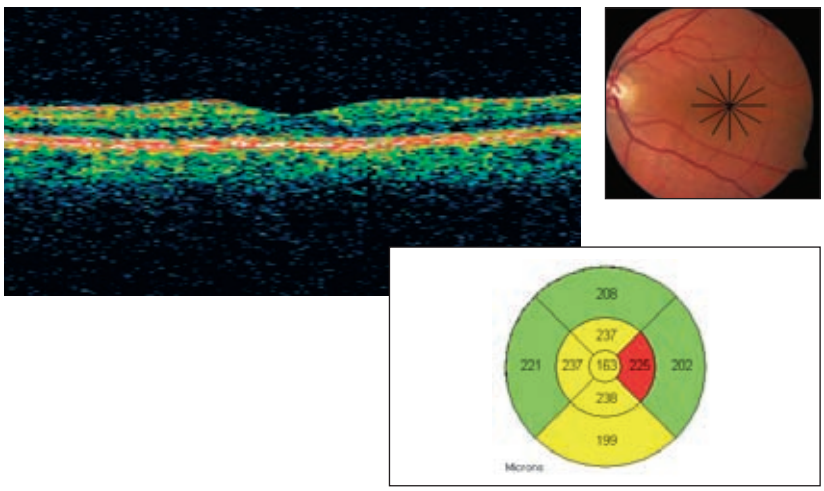
Retinal Nerve Fiber Layer Analysis

- Analysis of RNFL aids in identification of early glaucomatous loss
- Circular scans of 3.4 mm diameter around optic nerve head provide measurement of RNFL in the peripapillary region
- RNFL thickness measurement is graphed in a TSNIT orientation and compared to age-matched normative data



Optic Nerve Head Analysis

- Radial line scans through optic disc provide cross-sectional information on cupping and neuroretinal rim area
- Disc margins are objectively identified using signal from end of RPE
- Key parameters include cup-to-disc ratio and horizontal integrated rim volume[1]



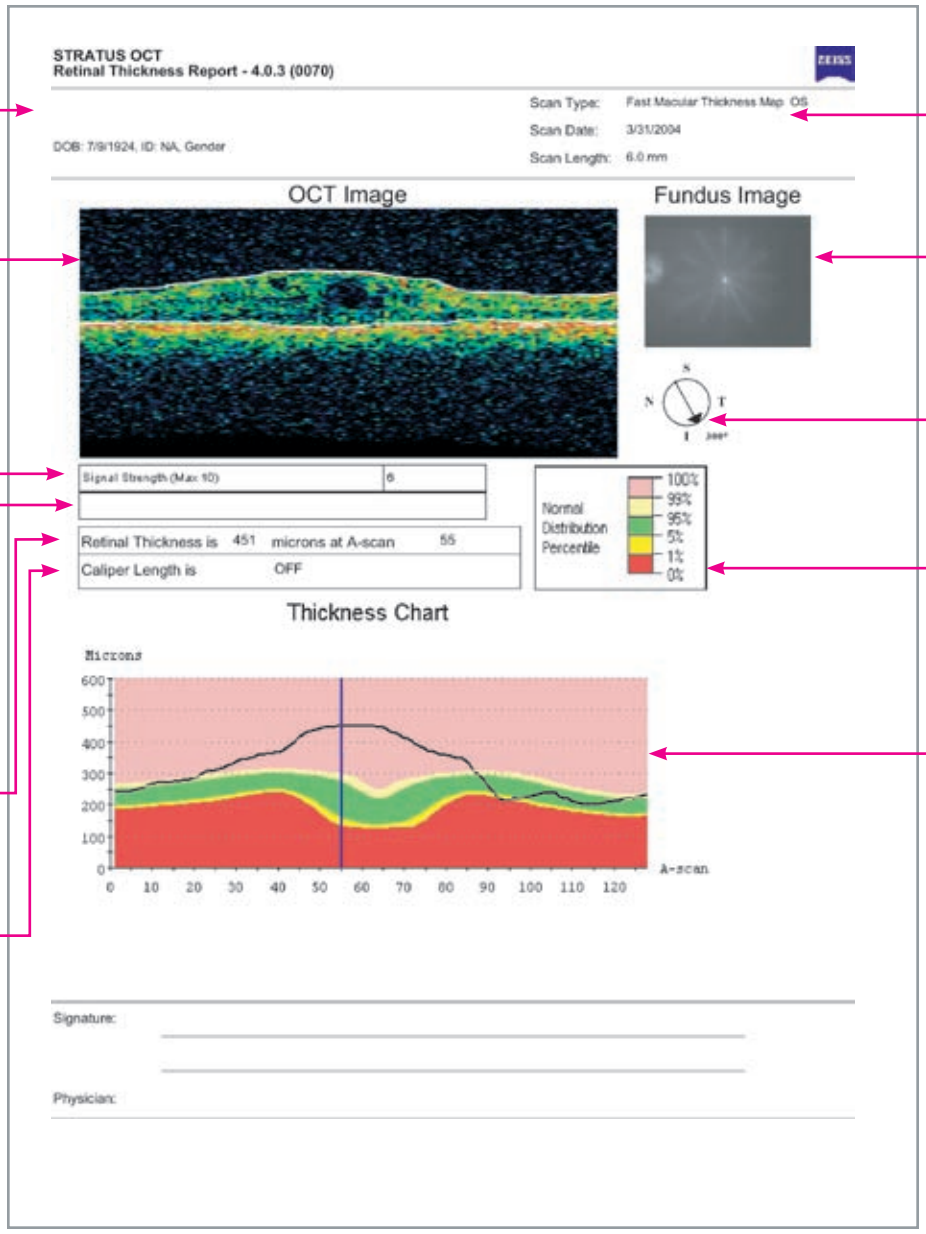
Macular Thickness Analysis

- Thinning of the macula may reflect glaucomatous loss
- Structural analysis of retinal sublayers reveals macular complications
- Cross-sectional view provides visualization and measurement of retinal layers

Stratus OCT Printout

Retinal Thickness Report

Scan Protocol: Fast Macular Thickness, Macular Thickness, Line, Cross Hair
Used for: Assessment of overall macular region or specific areas of interest



Patient Information

Scan Information

Scan Image

The image with the lowest signal strength or with a data message will be shown to facilitate operator review.

Fundus Image

Scan should be centered on fovea.

Signal Strength

Numbers range from 0 (weak) to 10 (strong). Analysis algorithm may fail on scans with low signal strength; therefore, images with a signal strength below 5 should not be used for analysis.

Legend

Arrow indicates direction and angle of individual scan displayed in scan image.

Data Message

"Scan Too High," "Scan Too Low" or "Missing Data" message will be shown, if applicable, regarding placement and completeness of scan.

Normative Data

Distribution is indicated by a stoplight color code, described in detail inside back cover.

Retinal Thickness

Displayed for A scan indicated. This corresponds to A scan (shown here) selected on thickness chart.

Thickness Chart

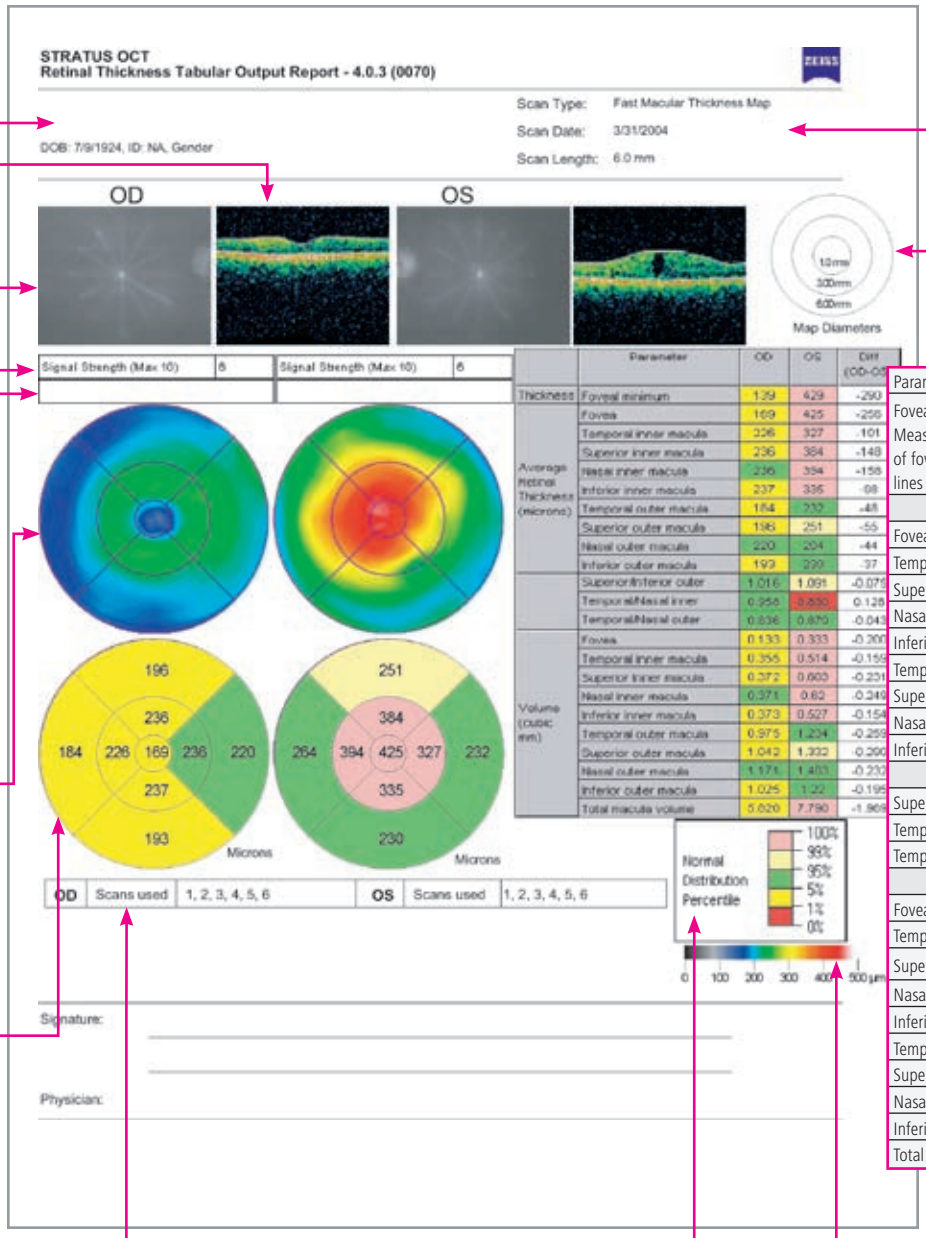
Graphic display of retinal thickness. Colored bands demonstrate range of normative data.

Caliper Length

Measurement indicates distance between calipers if they are placed on scan image during analysis.

Retinal Thickness Tabular Output

Scan Protocol: Radial Lines, Fast Macular Thickness, Macular Thickness
Used for: Imaging and measurement of macular pathology



Patient Information

Scan Image

The image with the lowest signal strength or with a data message will be shown to facilitate operator review.

Fundus Image

Scan should be centered on the fovea.

Signal Strength

Numbers range from 0 (weak) to 10 (strong). Analysis algorithm may fail for scans with low signal strength; therefore, images with a signal strength below 5 should not be used for analysis.

Data Message

"Scan Too High," "Scan Too Low" or "Missing Data" message will be shown, if applicable, regarding placement and completeness of scan.

Map

Thickness is displayed using a color scale. A normal eye will be displayed as blue centrally. Orange and red indicate greater thickness. Legend for color scale appears near bottom right of page.

Sector Averages

Numerical values indicate average thickness of each sector. Colors within each sector indicate comparison to normative data.

Scans Used

If any of the 6 radial line scans has been deselected, analysis might be incomplete.

Legend

Normative data is displayed in stoplight color code, described in detail inside back page.

Color Scale

For thickness maps.

Scan Information

Map Diameters

Diameters at which sector averages are calculated. Can be 1.0, 2.22 and 3.45 mm diameters or 1.0, 3.0 and 6.0 mm diameters as shown here.

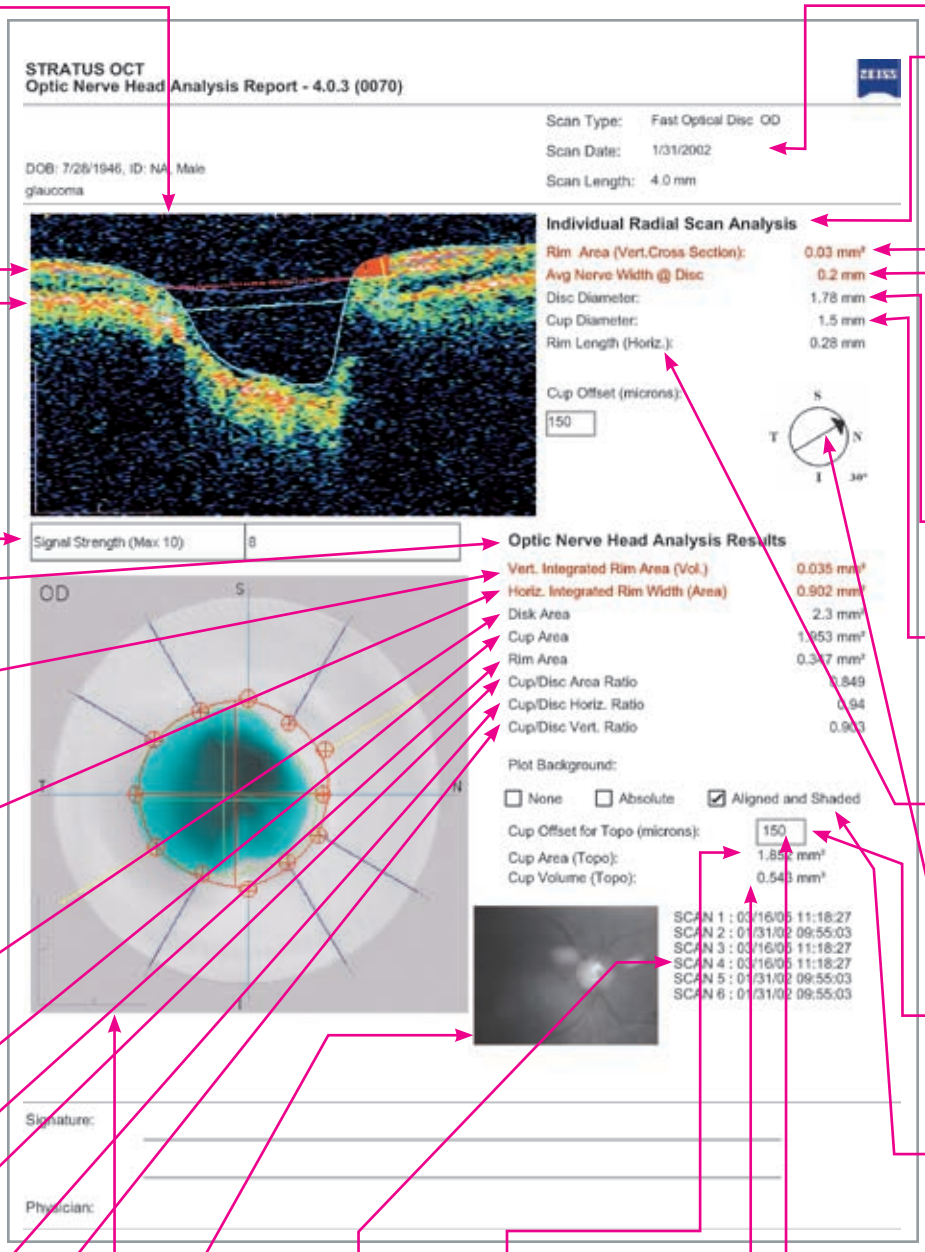
Parameter	Normal Range
Fovea Minimum: Measurement at center of fovea where radial scan lines intersect	135 – 215 µm
	Average Thickness
Fovea	168 – 239 µm
Temporal Inner Macula	240 – 294 µm
Superior Inner Macula	243 – 296 µm
Nasal Inner Macula	240 – 297 µm
Inferior Inner Macula	246 – 297 µm
Temporal Outer Macula	199 – 276 µm
Superior Outer Macula	207 – 256 µm
Nasal Outer Macula	198 – 274 µm
Inferior Outer Macula	207 – 256 µm
	Ratios
Superior/Inferior Outer	0.832 – 1.222
Temporal/Nasal Inner	0.800 – 1.227
Temporal/Nasal Outer	0.557 – 1.845
	Volume
Fovea	0.13 – 0.19 cubic mm
Temporal Inner Macula	0.38 – 0.46 cubic mm
Superior Inner Macula	0.38 – 0.46 cubic mm
Nasal Inner Macula	0.38 – 0.47 cubic mm
Inferior Inner Macula	0.39 – 0.47 cubic mm
Temporal Outer Macula	1.06 – 1.46 cubic mm
Superior Outer Macula	1.10 – 1.36 cubic mm
Nasal Outer Macula	1.05 – 1.45 cubic mm
Inferior Outer Macula	1.10 – 1.35 cubic mm
Total Macula Volume	6.18 – 7.42 cubic mm

Normal distribution, macula thickness normative data, Carl Zeiss Meditec.

Stratus OCT Printout

Optic Nerve Head Analysis Report

Scan Protocol: Optic Disc, Fast Optic Disc
Used for: Evaluation of the optic disc



Patient Information

Cup Markers

The edge of the cup is indicated with a green dot on the scan image and a green x on the composite diagram.

RPE Markers

The end of the RPE is indicated. Shown blue on the scan image, red on the composite diagram.

Signal Strength

Numbers range from 0 (weak) to 10 (strong). Analysis algorithm may fail on scans with low signal strength; therefore, images with a signal strength below 5 should not be used for analysis.

Optic Nerve Head Results

Data are derived from the 6 radial line scans.

Vertical Integrated Rim Area

Total volume of RNFL tissue in the rim is obtained by multiplying the average of the 6 individual rim areas by the circumference of the disc. Normal values are 0.36 ± 0.08 cubic mm.[2]

Horizontal Integrated Rim Width

Total rim area is obtained by multiplying the average of the 6 individual nerve widths by the circumference of the disc.

Disc Area

The area within the red outline on the composite diagram.

Cup Area

The area within the green outline on the composite diagram.

Rim Area

Disc area minus cup area.

Cup/Disc Area Ratio

Ratio of cup area to disc area.

Cup/Disc Horizontal Ratio

Ratio of the longest horizontal line across the cup to the longest horizontal line across the disc.

Cup/Disc Vertical Ratio

Ratio of the longest vertical line across the cup to the longest vertical line across the disc.

Fundus Image

Can be used to verify scan placement.

Composite Diagram

Yellow line indicates individual scan selected and displayed above.

Scan List

For each of the 6 radial line scans, this indicates the date when the scan was last adjusted and saved.

Cup Area

The area within the green outline on the composite diagram.

Cup Volume

Volume of cup area on the topographic display.

Cup Offset for Topo

Default is 150 µm anterior to disc. Represents edge of blue shading on topographic display—the surface of the cup as if it were filled with water.

Scan Information

Individual Radial Scan Analysis

Data relates only to the individual scan image displayed.

Rim Area

Indicated with red shading on scan image, this area is bounded by the cup diameter line and a line from the RPE marker to the anterior surface of the disc, at a 90-degree angle to the cup diameter line.

Average Nerve Width @ Disc

The average of the nerve bundle widths at the disc on each side. Nerve bundle width indicated by yellow line from RPE marker to anterior surface.

Disc Diameter

Illustrated and measured on a straight line between the 2 RPE markers. Blue line on scan image.

Cup Diameter

Illustrated and measured on a straight line parallel to, and 150 µm anterior to, the disc diameter line. Red on image, green on diagram, this line is adjustable.

Horizontal Rim Length

Disc diameter minus the cup diameter.

Legend

Arrow indicates direction and angle of individual scan displayed in scan image.

Cup Offset

Point at which cup diameter is measured. Default placement is 150 µm anterior to the RPE markers; this point is adjustable.

Plot Background

There are 3 optional backgrounds; two are similar to a topographic map. Aligned and Shaded (default) provides a shaded relief topographic map and corrects for patient motion. Absolute provides a non-shaded topographic map with no correction for movement. None shows a solid gray background with no appearance of depth.

RNFL Thickness Average Analysis

Scan Protocol: RNFL 3.4 mm, Fast RNFL 3.4 mm

Used for: Retinal nerve fiber layer thickness assessment and comparison to normative database

Patient Information

RNFL Thickness Chart

Peripapillary RNFL thickness is displayed in TSNIT format. Colored bands demonstrate range of normative data.

Sector Averages

Comparison to normative data in each sector is indicated with stoplight color scheme. Values are displayed numerically.

Quadrant Averages

Comparison to normative data in each quadrant is indicated with stoplight color scheme. Values are displayed numerically.

OD/OS Graph

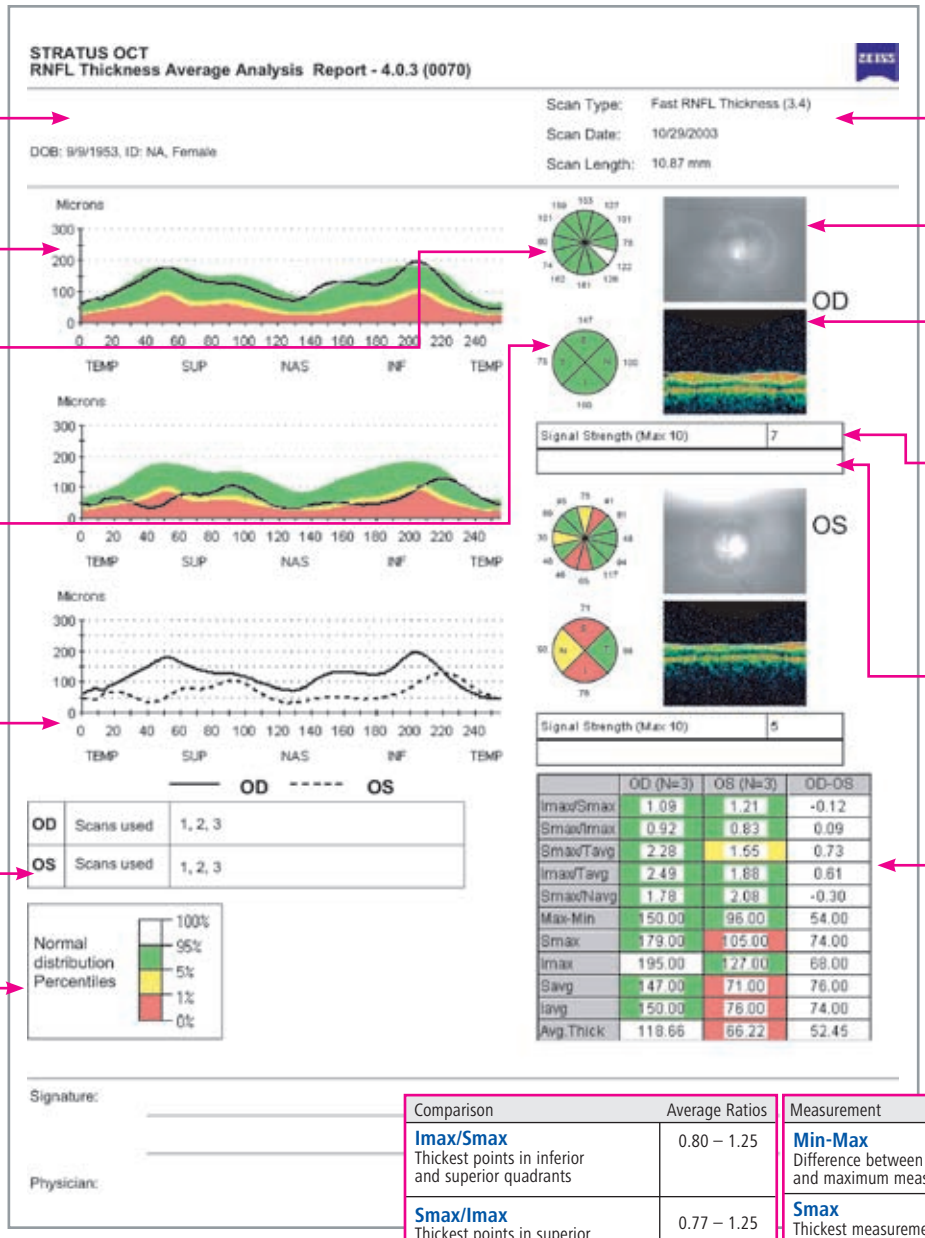
TSNIT line graph displays RNFL thickness in both eyes. Asymmetry may be indicative of glaucomatous loss.

Scans Used

If any of the 3 circular scans has been deselected, analysis might be incomplete and for the fast RNFL scan, normative data will not be displayed.

Legend

Normative data is displayed in stoplight color code, described in detail on inside back cover.



Scan Information

Fundus Image

To verify scan placement.

Scan Image

The image with the lowest signal strength or with a data message will be shown to facilitate operator review.

Signal Strength

Numbers range from 0 (weak) to 10 (strong). Analysis algorithm may fail on scans with low signal strength; therefore, images with a signal strength below 5 should not be used for analysis.

Data Message

"Scan Too High," "Scan Too Low" or "Missing Data" message will be shown, if applicable, regarding placement and completeness of scan.

Tabular Data

For each eye, values are compared to normative data and displayed in stoplight color code, described in detail on inside back cover.

Comparison	Average Ratios
Imax/Smax Thickest points in inferior and superior quadrants	0.80 – 1.25
Smax/Imax Thickest points in superior and inferior quadrants	0.77 – 1.25
Smax/Tavg Thickest point in superior quadrant to average in temporal	1.70 – 3.06
Imax/Tavg Thickest point in inferior quadrant to average in temporal	1.69 – 3.12
Smax/Navg Thickest point in superior quadrant to average in nasal	1.37 – 2.93

Measurement	Average Values
Min-Max Difference between minimum and maximum measurements	96 – 154 µm
Smax Thickest measurement in superior quadrant	124 – 189 µm
Imax Thickest measurement in inferior quadrant	125 – 194 µm
Savg Average measurement in superior quadrant	97 – 152 µm
Iavg Average thickness in inferior quadrant	98 – 156 µm
Average Thickness	82 – 118 µm

Normal distribution, RNFL normative data, Carl Zeiss Meditec.

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GPA™ Advanced Serial Analysis

Scan Protocol: Fast RNFL Thickness (3.4), RNFL Thickness (2.27 x disc)
Used for: Statistical analysis of RNFL thickness change over time. Can be applied to up to 8 OD and/or 8 OS scan groups

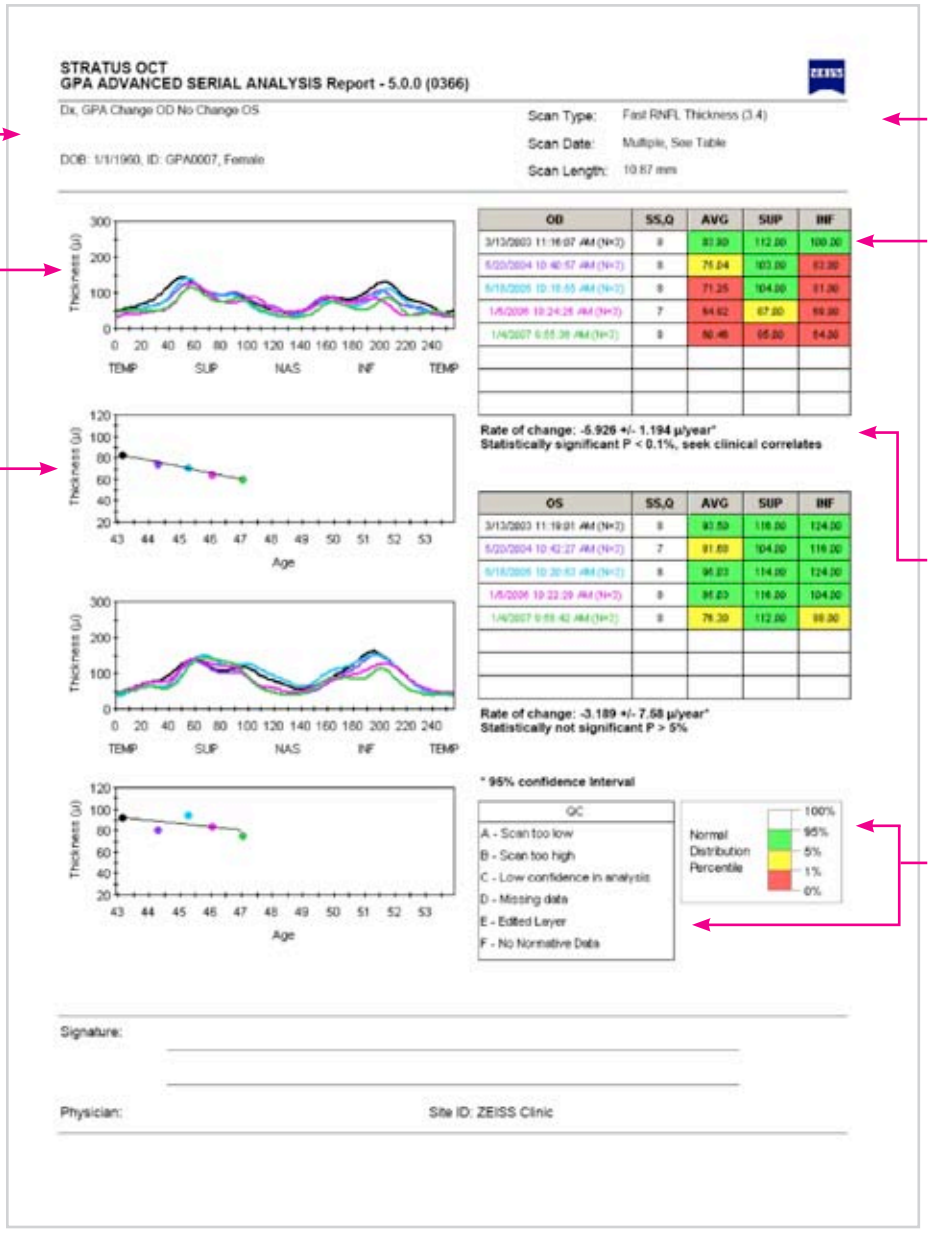
Patient Information

TSNIT Graph

Peripapillary RNFL thickness is displayed in TSNIT format. Line colors correspond to scan date, as shown in the RNFL summary table.

Thickness over time graph

Average RNFL thickness for each exam is plotted. Dot colors correspond to scan date, as shown in the RNFL summary table.



Scan Information

RNFL summary table

Average, superior quadrant and inferior quadrant RNFL thickness values for each scan are displayed in table format. In addition, important signal strength (SS) and quality (Q) notes are shown. The color scheme in each cell corresponds to familiar comparisons to normative data.

Rate of change

Reports rate of change with confidence limits on that rate. Also reports p-value and whether a statistically significant change has occurred.

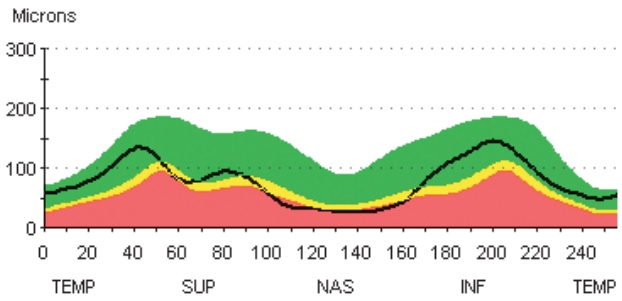
Legends

Normative data is displayed in stoplight color code, described in detail inside back page. The "QC" table provides explanations for quality abbreviations.

Stratus OCT Normative Data

Stoplight Color Scheme

RNFL Normative Data Display

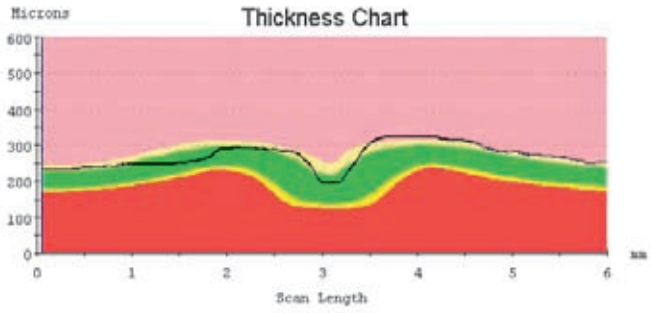


RNFL Normative Distribution

Of the normal population:

5%	100%	5% fall within the white band
90%	95%	95% fall within or below the green band 90% fall within the green band
4%	5%	5% fall within or below the yellow band
1%	1%	1% fall within the red band; considered outside the normal limit
	0%	

Macula Normative Data Display



Macula Normative Distribution

Of the normal population:

1%	100%	1% fall within the light red band; considered outside the normal limit
4%	99%	5% fall within or above the light yellow band
90%	95%	95% fall within or below the green band 90% fall within the green band
4%	5%	5% fall within or below the yellow band
1%	1%	1% fall within the red band; considered outside the normal limit
	0%	

At Carl Zeiss Meditec, we are committed to expanding clinical potential with innovative, precise and clinically advanced instruments that contribute to the enhancement of vision worldwide. And, through lifetime customer care and ongoing technology upgrades, we are also dedicated to ensuring your success now and throughout the future. For more information on the Stratus OCT system or to order, contact your Carl Zeiss Meditec representative today, or visit our website at www.meditec.zeiss.com/stratus.

Technical Specifications

Tomographic Imaging	
Purpose	Cross-sectional imaging of retina
Signal type	Optical scattering from tissue
Signal source	Superluminescent diode, 820 nm
Optical power	≤750 microwatts at cornea
Longitudinal/Axial resolution	≤10 µm in tissue
Transverse sample size	20 µm in tissue
Scanners	Galvanometric mirror
Scan patterns	Line, circle, concentric rings, radial lines
Scan pixels	Adjustable from (1024 axial x 128 transverse) to (1024 axial x 768 transverse)
Longitudinal (depth) range	2 mm in tissue
Scan rate	400 A scan/sec
Fundus Imaging	
Purpose	Fundus alignment, documentation
Signal type	CCD image
Field of view	26° x 20.5°
Viewing method	Flat panel display
Illumination	Near IR/red-free
Internal fixation	32 x 16 LED dot matrix
External fixation	Slit lamp type adjustable blinking LED
Minimum pupil diameter	3.2 mm
Electrical	
Power consumption	100 V approx. (±10%), 50/60 Hz, 6.0 A 115 V approx. (±10%), 60 Hz, 6.0 A 230 V approx. (±10%), 50/60 Hz, 3.0 A 700 VA
Footprint	
Patient module	48 inches x 34 inches, 120 cm x 85 cm
User Features	
Processor	2.4 GHz Pentium® IV
Operating system	Windows® 2000
Memory	512 MB
Standards and Approvals	
UL 2601-1	
CSA 22.2 No. 601.1	
MDD	

Note: All technical specifications are subject to change without notice.

1. Wollstein G, Ishikawa H, Wang J, Beaton SA, Schuman JS. Comparison of three optical coherence tomography scanning areas for detection of glaucomatous damage. *Am J Ophthalmol.* 2005;139(1):39-43.
2. Schuman JS, Wollstein G, Farra T, et al. Comparison of optic nerve head measurements obtained by optical coherence tomography and confocal scanning laser ophthalmoscopy. *Am J Ophthalmol.* 2003;135(4):504-512.

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