

Quick Reference Chart

# Corrected IOP

for Corneal Thickness



Corneal Thickness $\mu\text{m}$	Correction Value mm Hg
445	+7
455	+6
465	+6
475	+5
485	+4
495	+4
505	+3
515	+2
525	+1
535	+1
545	0
555	-1
565	-1
575	-2
585	-3
595	-4
605	-4
615	-5
625	-6
635	-6
645	-7

Correction values for applanation tonometry readings according to corneal thickness.

Calculation based on data of Ehlers et al (1975). Modified from Stodtmeister (1998)

Arithmetic mean of corneal thickness in healthy subjects: 545  $\mu\text{m}$  (Doughty and Zaman 2000)

Correction values according to corneal thickness of 545  $\mu\text{m}$ .

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## SUBJECTIVE: Sonogage History

Sonogage, Inc. was founded in 1985, to provide state-of-the-art ophthalmic instrumentation at economical prices. Sonogage has pioneered instrumentation and has revolutionized ultrasonic pachometry. Technological advances that have been made by Sonogage include:

- Measurement of the Speed of Sound in human cornea—1636 m/sec. This value was adopted as the standard.
- Introduced the first completely solid tip probe for use with ultrasound measuring instrumentation.
- Introduced state-of-the-art electronics for providing the smallest acceptance angle (5°) in the industry.
- Introduced the first continuous read feature in ultrasonic instrumentation.
- Introduced the first 50 MHz transducer for measurement of corneal thickness and corneal epithelium.
- In conjunction with J.C. Casebeer, M.D., developed the Casebeer System Plus™ for refractive surgery. This includes the Corneo-Gage ultrasonic pachometer “continuous-read” feature enabling enhanced reading reproduction and accuracy.
- Introduced advanced electronics featured in a portable A-scan biometer—EYESCAN™--incorporating “continuous-read” feature for ease of use and enhanced measurement reproduction and accuracy.

Sonogage CORNEO-GAGE™ PLUS pachometers are acknowledged to be the most accurate and measurement-reproducible pachometers available due to their use exclusive of 50 MHz transducers and smallest tip footprint available coupled with their advanced electronics and 1000 measurement average for every displayed reading. This technology allows for measurements applicable to all facets and applications of blade refractive surgery: RK/AK, intrastromal ring implantation, LASIK, LASEK, PRK, and corneal reshaping procedures. Presently, over 7500 surgeons worldwide use Sonogage Corneo-Gage™ pachometers and more doctors than all other pachometers combined. Users include: Dr. R. Lindstrom, Dr. M. McDonald, Dr. Geo. Waring, Dr. P. Binder, Dr. J. Salz, Dr. J. Machat, Dr. I. Pallikaris, Dr. D. Durrie, Dr. L. Ruiz, Dr. S. Slade, Dr. H. Gimbel, Dr. T. Werblin, Dr. L. Phillips, Dr. R. Melton, Dr. R. Thomas, Dr. W. Choate, Dr. M.J. Stiegemeier, Dr. L. Rigel, Dr. B. Gaddie, Dr. P. Karpecki and many others.<sup>(2)</sup>

Sonogage is committed to bringing to ophthalmology and optometry the highest quality instrumentation and to excel in customer service and satisfaction. They are available 24 hours a day through fax: (216) 831-3444, and e-mail address [sonogage@algxmail.com](mailto:sonogage@algxmail.com), or call toll free at: (800) 798-1119. You can Visit Sonogage at [www.sonogage.com](http://www.sonogage.com).

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## OBJECTIVE: Features and Specifications

- 50 MHz solid, high frequency transducer: 1.50mm diam.
- Averages 1000 ultrasonic echoes per reading
- Portable, long life (months) rechargeable battery, no power cord or foot pedal
- Battery level indicator
- Solid tip probe
- Exclusive “continuous read” mode
- 100 memory storage locations
- Automatic calibration verification
- Auto storage – no foot pedal
- Optional built-in printer
- Measurement range 0.025mm to 2.00mm
- Repeatability: +/- 3 um
- Display: LCD
- Easy to see white probe touch on the cornea
- Weight: 5 lbs.
- Accuracy: +/- 0.4 um
- Footprint: 13.75 x 8.5 x 6.75 inches



## WHY 50 MHZ?

**SONOGAGE** exclusively uses **50 MHZ** transducers, the same frequency that is available in the ultrasonic biomicroscopes on the market. Why? —Simply because **SONOGAGE** is the leader in pachometer transducer design and is ahead of the competition in offering the latest in technology & precision engineering. Other pachometer manufacturers only offer 10-20 MHz transducers, which limit accuracy, reproducibility and ease of getting measurements.

50 MHz transducers give you 2.5 times the resolution of other pachometer transducers. This is the equivalent of giving you a ruler with 2.5 times the number of demarcations! In addition, 50 MHz gives you a small pulse width, which allows the unit to measure interfaces where the speed of sound differs only slightly---because of this; one can measure stromal bed and epithelium thicknesses accurately & easily. For today's corneal thickness needs 20 MHz is not accurate enough---any error is compounded---articulation is critical (5 degrees for us vs. 15 degrees or greater for others) and the ability to measure thin values (300 microns or less) is essential. Epithelium has up to 2 diopters of refractive error---in PRK and Lasik cases it is important to monitor epithelium regrowth and postoperative thickening to insure the desired results. Sonogage **Corneo-Gage Plus** is the only ultrasonic pachometer capable of measuring epithelial thickness and the 50MHz is the key.

## ASSESSMENT

The Sonogage Corneo-Gage Plus™ is the most sophisticated and technologically advanced pachometer available. The biggest difference is in the fact that they use a 50 MHz high-frequency transducers (the only one to date) and that's what makes them more accurate and able to measure the epi separately. There are other innovative features that they have that have been copied by their competitors. If you are doing Ortho-k (corneal reshaping), myopia containment or just plain RGP fitting, it's wonderful to be able to baseline and then monitor the epi thickness to not get down too thin and cause physiological complications.

James J. Saltz, M.D., in a front page article in, Ocular Surgery News, documents the Sonogage as being the only unit able to measure thin corneal distances. Dr. Saltz states, "This pachometer is particularly good at measuring. You simply touch it to the cornea, and, in a split second, it gives you a reading, without having to wet the cornea."

Mary Jo Stiegemeier, O.D., in a front page article in Primary Care Optometry News, talks about how the Sonogage can differentiate between full corneal thickness and epithelium alone making it invaluable for assessing corneal thickness or swelling in CL modes, during a refractive surgery consultation, in disease entities such as KC or Fuch's or in myopia control or Ortho-K.

Lou Phillips, O.D., states what he thinks is important in a pachometer. *Battery operation.* Permits mobility around the office and ease to bring the instrument to the patient instead of the other way around. *Memory.* You need to be able to scroll through the readings to find the lowest reading. *50 MHZ probe.* The higher frequency probe is theoretically more accurate. "I have used the Sonogage pachometer for over three years, as well as other pachometers. I prefer the Sonogage. The battery needs to be charged about once every six months unless you use a printer. I do not see the need for a printer and it draws power from the battery. ...epithelial thickness may have a role in CRT." Dr. Phillips also prefers the white, easy-to-use probe. As for service he states, "dealings with Sonogage would suggest that they will stand behind their equipment." Dr. Phillips says that the averaging feature of some pachometers can give false high readings as compared to the continuous read that the Sonogage has.

## ECONOMICS:

Pachometry is reimbursable for ocular hypertension suspects and glaucoma patients under CPT code 76514. Presently the reimbursement rate ranges from \$11.00 to \$14.00 for bilateral measurements.