Sensitometers and densitometers work in tandem. Sensitometers imprint a standard set of exposures on a photographic or x-ray film sample. When the film sample is developed, a densitometer is used to read the optical density of the exposures and chart a profile against a known set of standards. This profile alerts you to fluctuations in processing conditions and allows you to take corrective action.

Densitometers and Sensitometers for your Processor QC

Consistent Image Quality

Functional Performance Specifications

396 Sensitometer

Exposure Stability
±.02 log exposure per year

Unit to Unit Repeatability
±.02 log exposure

Temperature Sensitivity
±.02 log exposure from 15° C;
(59°F) to 30°C (86°F)

Power Requirement
9 volt alkaline battery (included)
approx. 10,000 exposures/battery

Light Modulation
21-step Wedge, 0.15D per step

Blue Color Peak Wavelength
455nm ± 10nm

Green Color Peak Wavelength
512nm ± 10nm

Warm-Up Time
None

Exposure Time
.1 second typical regulated
by light accumulation system

Recycle Time
2 seconds

Physical Dimensions
2.3" H (5.84cm)
3.75" W (9.50cm)
7.0" L (17.78cm)

Weight
.9 lbs. (410g)

Features
DIN V 6868-55

301 Densitometer

Measuring Range
0-5.0D with 2 and 3mm apertures
0-4.0D with 1mm aperture

Accuracy
±.02D

Repeatability
±.01D

Operating Temperature Range
10° - 40°C   50° - 104°F

Power Requirements
301 (Domestic): 100-130VAC,60Hz
301X (Export): 200-240VAC,
50Hz (80VA max.)

Warm-Up Time
60 seconds

Scale Factor (slope) Stability
±1% per 6 months

Null Drift
± .03D max.
± .01D typical

Options
301X – 230V,50Hz power line
301RS – RS-232 serial
output – 300 baud

Physical Dimensions
5.25" H (13.3cm)
10.25" W (26.0cm)
15.0" L (38.0cm)

Weight
8.5lbs (3.9kg)

331 Densitometer

Measuring Range
0-3.5D (1mm)   0-4.0D (2mm)

Accuracy
±.02D

Repeatability
±.01D

Operating Temperature Range
10° - 40°C   50° - 104°F

Power Requirements
P/N SE30-45 (115VAC) or
P/N SE30-46 (230VAC) 50-60Hz

Warm-Up Time
None

Scale Factor (slope) Stability
±1% per 6 months

Zero Stability per 8 hours
±.02D (.01 typical)

Measuring Area
1 & 2 mm

Measuring Length
5.5 inches

Power Supply
4 rechargeable AA Ni-Cad
batteries and charger

Physical Dimensions
2.0" H (5.08cm)
2.9" W (7.46cm)
7.0" L (17.78cm)

Weight
1.5lbs (680g)

390/391 Densitometer

Measuring Range
0-4.5D

Accuracy
±.02D (0-3.0D) ±2% (3.0-3.4D)

Repeatability
±.01D (0-3.0D), ±1% (3.01-3.5D),
±2% (3.51-4.0D)

Operating Temperature Range
10° - 40°C   50° - 104°F

Power Requirements
12V DC, Universal 100-240VAC
adapter; 50/60 Hz P/N SE30-77

Spectral Response
ANSI Visual

Reading Speed
1.2 inches per second

Accessories
Operation manual, AC adapter,
cable and interface adapter.

Data Storage
12 Channels / 31 readings
per channel (391)
4 Channels / 1 reading
per channel (390)

Features (391 Only)
Aim Value Editor
Control Limit Editor

Physical Dimensions
2.8" H (7.1cm)
7.2" W (18.3cm)
6" L (15cm)

Weight
2.5lbs (1.14kg)

Consistent quality images for diagnosis

Fewer retakes and less patient exposure to radiation

Progress in meeting standards requirements

L8-022 (09/05)

In an industry that wakes up to change every morning, companies need to anticipate and exceed the expectations of hospital radiology departments, clinics, mobile units, and medical offices. X-Rite has been doing that for nearly half a century.

The X-Rite product line includes both manual spot reading and auto-scanning densitometers. Our spot reading models are perfect for field use, providing the same accuracy as larger, table-top models. Our auto-scanning densitometers perform automated calculations (including daily control parameters) and can generate daily D-log E curves. Their internal memory is capable of storing data from multiple processors. The scanning densitometers are also able to communicate data through networking software to a central database, eliminating the need for a computer at every facility.
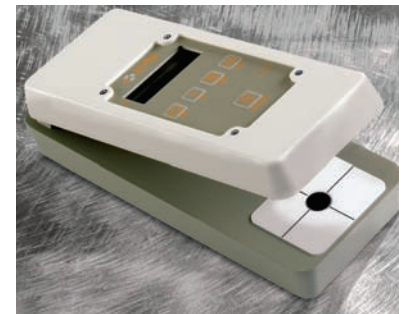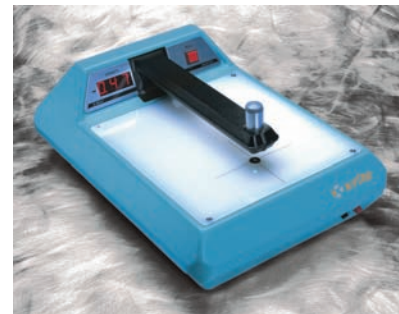
396 Sensitometer

Performance Features
Small and convenient, the 396 Dual-Color Sensitometer provides single-sided exposures and produces repeatable 21 step exposures on film.

Easy to Use
Set the battery operated 396 to the proper exposure, place the film inside, then firmly press down on the cover. When you hear the beep, the exposure is complete.

DIN Specifications
Designed and manufactured to comply with the calibration requirements described in DIN V 6868-55.

301 Densitometer

Performance Features
The 301 Densitometer provides highly repeatable and accurate measurements of black and white film densities up to 5.0D – more subtle than can be seen by the naked eye.

An optional RS232 output allows you to connect to your current computer.

Easy to Use
Operation is as simple as "push and read," and the large LED numerals can be read easily in bright or dim light. Internal memory and the null button allow the operator to make comparative density measurements across a piece of film.

331 Densitometer

Performance Features
Though the 331 Densitometer is portable and compact, it has the same accuracy and repeatability as larger countertop units, measuring densities up to 4.0 D.

Easy to Use
The built-in light table eliminates the need for an external light source and easily accommodates film up to eleven inches wide. The 331 has push-button zeroing, an on/off switch to prevent battery drainage, a certified step wedge, a low-battery indicator, and instrument carrying case.

390 Densitometer

Performance Features
The 390 Densitometer can read and calculate a complete set of control strip data in under a minute, saving you time and virtually eliminating data-taking errors. The 390 easily interfaces with quality control software such as x-Read QC Analysis software.

Easy to Use
The 390 automatically reads, calculates, stores, and displays data. With the push of a button, you can view the measurements just taken.

391 Densitometer

Performance Features
The 391 includes all of the capabilities of the 390 and automatically establishes **aim values and control limits, calculates cross-over values, and plots monthly control charts** – freeing the technologist to focus on patient care. Thirty-one daily readings for up to twelve processors can be stored in the internal memory. Networking capabilities of the 391 enable facilities with multiple processor sites to communicate processor quality control information across phone lines.

Easy to Use
The 391 reads and stores densities in less time than it takes to measure manually. Immediately after completing a measurement, the 391 displays the 21 density readings in addition to QC parameters, such as base plus fog, speed, contrast index, average gradient, D-Max, and gamma.

x-Read QC Analysis Software

Performance Features
x-Read, from Medical Cost Containment Consultants, Inc., sets standards and user-defined high/low allowances for each processor. Create history graphs, store unlimited number of readings, and monitor an unlimited number of processors.

Specifications
Windows 95, 98, 2000, or NT compatible. Connects to X-Rite 390, 391, 380, and 381 densitometers.

Cost Saving Packages

Package 1:
390 densitometer,
396 sensitometer,
x-Read QC Analysis Software,
cable

Package 2:
390 densitometer,
x-Read QC Analysis Software,
cable

X-Rite

Critical X-Ray Process Control Package

- **390 Auto-Scan Densitometer**
- **396 Dual-Color Process Control Sensitometer**
- **x-Read QC Analysis Software**

Proven Accuracy and Reliability

To safeguard the health of your patients, monitor your film processing daily with quality control instrumentation from X-Rite. Proper quality control ensures the highest quality films, reduces the need for repeat examinations, and alerts you to changes in processing conditions.

X-Rite offers both the finest QC technology in the medical imaging industry and the finest QC analysis software, x-Read from Medical Cost Containment Consultants, Inc.

Accurate, durable, and reliable, X-Rite densitometers and sensito-meters are backed with unsurpassed technical support and service, freeing you to devote more time to patient care. Our instrument service contract includes two annual recertifications and a total of three years of service coverage.

Available in the U.S.A. only.

390

The 390 quickly and accurately measures 21-step sensitometric strips from any X-Rite sensitometer.

The 390 Auto-Scan Densitometer:

- Displays density values and calculates base plus fog, speed or mid-density, contrast or density difference, average gradient, D-Max, and gamma
- Performs darkroom fog, film/screen contact, and most common Phantom tests
- Generates daily D-log E curves that include control parameter measurements
- Connects to third-party software programs or printers through RS232 interface
- Transmits readings to a computer for data storage, analysis, and reporting
- Verifies calibration automatically

396

Repeatability and simplicity are the hallmarks of the 396.

The 396 Dual-Color Sensitometer:

- Provides highly repeatable results on single/dual-sided, blue/green-sensitive film
- Meets performance standards outlined in the DIN V 6868-55 specification
- Features exposure-time control
- Adapts to x-ray, roll, or cine film

x-Read Software

To eliminate the drudgery of hand-entering data, interface your processors with your personal computer using x-Read software.

Features:

- Works with any Windows® 95-, 98-, 2000-, or NT-compatible computer
- Stores an unlimited number of readings in each processor file
- Sets standards and user-defined hi/lo allowances for each processor
- Creates history graphs for each processor, representing any time period you select (up to 31 days)
- Monitors an unlimited number of processors

Specifications for 390 & 396

390

MEASURING RANGE
0-4.5D

ACCURACY
±.02D (0-3.0D) ±2% (3.0-3.4D)

REPEATABILITY
±.01D (0-3.0D), ±1% (3.01-3.5D), ±2% (3.51-4.0D)

SPECTRAL RESPONSE
ANSI Visual

POWER REQUIREMENTS
12V DC, Universal 100-240VAC adapter, 50/60 Hz
P/N SE30-77

READING SPEED
1.2 inches per second

OPERATING TEMPERATURE RANGE
10° - 40°C   50° - 104°F

PHYSICAL DIMENSIONS
2.8" H (7.1cm) 7.2" W (18.3cm) 6" L (15cm)

ACCESSORIES
Operation manual, AC adapter, cable and interface adapter.

396

EXPOSURE STABILITY
±.02 log exposure per year

UNIT TO UNIT REPEATABILITY
±.02 log exposure

TEMPERATURE SENSITIVITY
±.02 log exposure 15° C (59°F) to 30° C (86°F)

POWER REQUIREMENTS
9 volt alkaline battery (included) approx. 10,000 exposures/battery

BLUE COLOR PEAK WAVELENGTH
455nm ± 10nm

GREEN COLOR PEAK WAVELENGTH
512nm ± 10nm

EXPOSURE TIME
.1 second typical regulated by light accumulation system

RECYCLE TIME
2 seconds

LIGHT MODULATION
21-step wedge, 0.15D per step

PHYSICAL DIMENSIONS
2.3" H (5.84cm) 3.75" W (9.50cm) 7.0" L (17.78cm)

WEIGHT
.9 lbs. (410g)

Specifications and design subject to change without notice.

X-Rite®

ISO 9001
Certified

X-RITE WORLD HEADQUARTERS
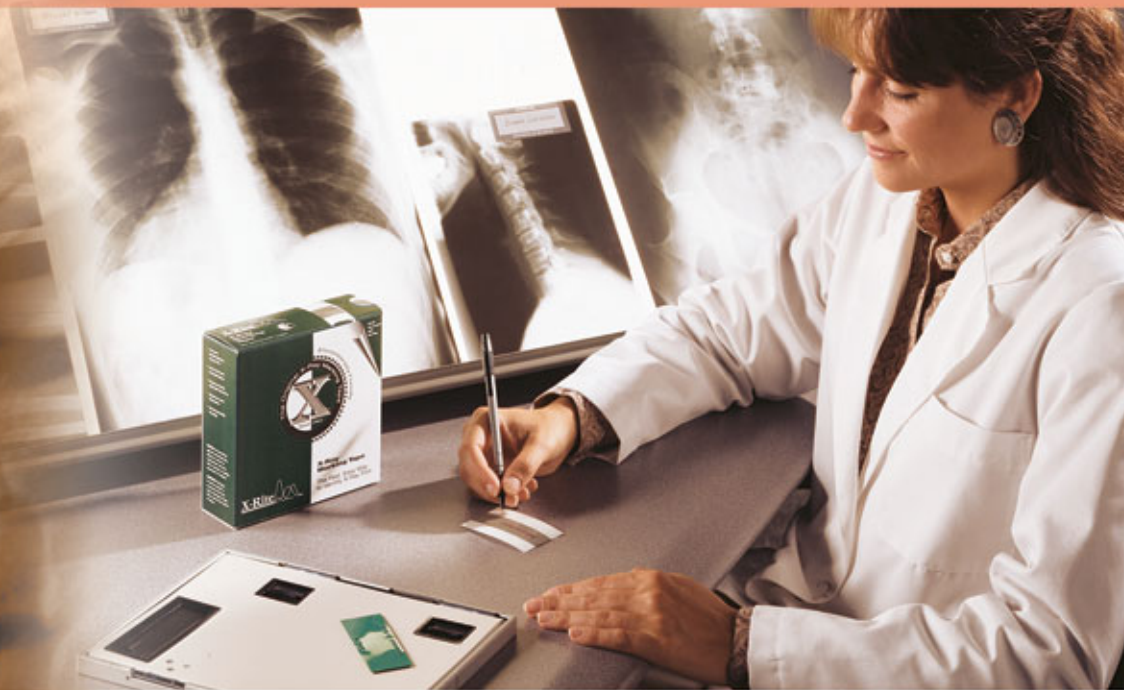**Grandville, Michigan USA**

Authorized Distributor:
M.D. McCAULEY CO., INC.
760-C South Rochester Ave., Ontario, California 91761 USA
Tel (909) 390-9313 Fax (909) 390-9061 Toll free 800-544-4743 www.xraymdm.com   info@xraymdm.com

![x-rite logo]

X-Ray Marking Tape System

The best way to mark x-ray film

Economical and Eco-friendly

The original and still the most popular x-ray marking system is also environmentally friendly. Only the X-Rite Marking Tape System offers these advantages:

- Gray (rather than black) marking area makes the tape easier to read, meaning fewer opportunities for error.
- Larger adhesive area on the overlapping tape improves adhesion to the film cassette.
- Tape formulation is completely lead free, keeping toxic heavy metals out of the waste stream.
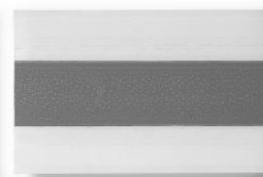
Original	New

Easy and Convenient

The X-Rite Marking Tape System features holder blockers in four different densities for various exposure levels. X-Rite marking tape is available in convenient 25-, 50- or 100-foot continuous rolls; it also comes in 100 or 300 pre-cut 3-inch tape strips.

Follow these six easy steps to provide clear, permanent, and complete patient/provider information on your x-rays.
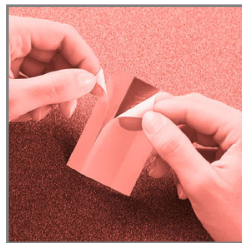
1—Cut the tape to the desired length or use the handy precut 3" strips.

2—Take a ballpoint pen and print patient data on the marking tape.
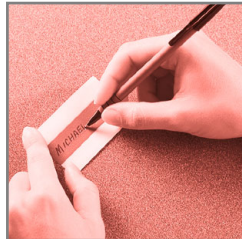
**3**—Remove the paper backing by folding slightly to split the two pieces.

4—Affix the tape to the holder blocker (imprinted with your provider identification) with the tape's gray imprint area centered down the holder blocker's length.

5—Affix the assembled label to any open area on the tube side of the film cassette and expose your film. The tape is oversized to overlap the holder blocker so it will provide positive adhesion to the cassette.

6—The patient name, additional data, and all provider identification appears on the developed x-ray using standard development methods. The job is completed in seconds using a minimum amount of space. Filing is made easier. Typical cost per x-ray is less than 25 cents.
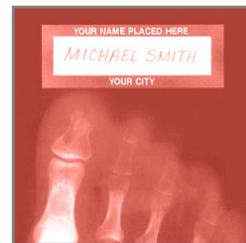
Holder Blockers

Holder blockers screen excessive radiation, enabling technicians to read the marking tape clearly at any setting. Holder blockers can be personalized with facility name, location, etc.—up to 26 characters on both the top and bottom—at no extra charge. Series 176 (used with 138 and 175 Series tape) includes Left/Right indicators. Series 177 includes Anterior-Posterior-Lateral-Medial indicators. For veterinarians, Series 178 includes Left Front/Right Front, Left Hind/Right Hind indicators. When an exposure is made with the holder blocker in place, customized information is automatically recorded on the film. Each density is color coded to simplify selection.

Selecting the Right Holder Blocker

- Identify the Kvp and MAS used for your x-ray technique.
- Refer to the chart (reproduced at right and on every carton) to select appropriate color.
- When using a Kvp higher than 80, the holder blocker and tape can be located in an area behind tissue so that the patient will filter the excess radiation.
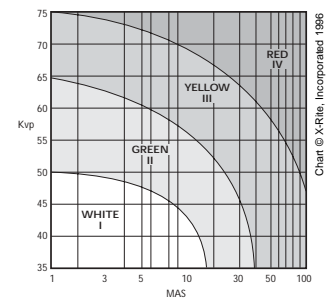
Kvp-MAS Chart

Gray represents density level.

Chart © X-Rite, Incorporated 1996

Holder Blockers for Specific Systems

DENTAL: CEPHLAMETRIC — 138A-Flat-(II) Green
PANORAMIC — 138B-Curved (i) White

GENERAL & VETERINARY: WHITE — Dental, Feet, Small Animals, and Bones
GREEN — Arms, Medium and Large Animals
YELLOW — Rarely Used
RED — Some Chiropractic Applications

x·rite

ISO 9001 Certified