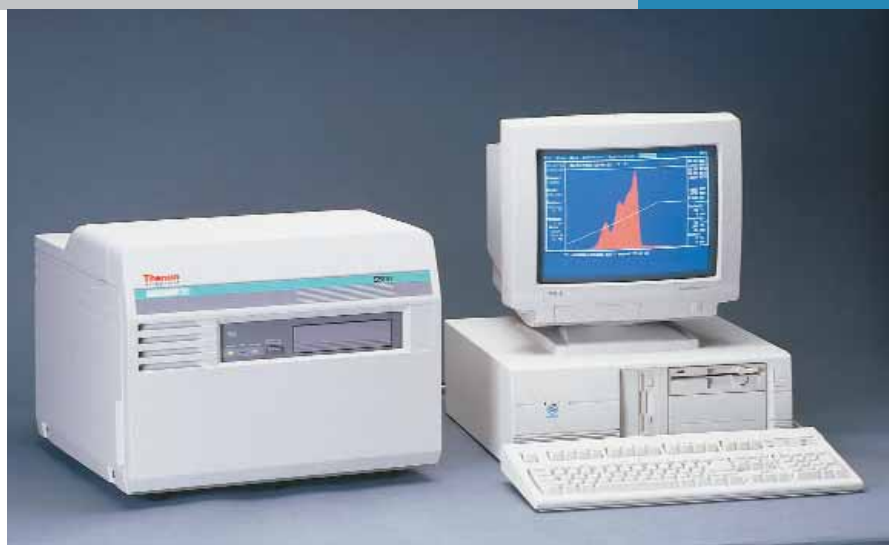
Product Specifications

The Harshaw 5500 TLD Reader provides cost-effective measurements of the radiation dose absorbed by individual TLD elements. The instrument includes an automatic sample changer and carrier disk for automatic processing of up to 50 TLD dosimeter elements in a single loading.

Harshaw 5500

Automatic Dosimetry Reader



- Automatic background subtraction capability
- Easy to operate, service and maintain
- Compact and attractive
- Linear contactless hot gas heating
- Optional glow curve deconvolution software
- Optional neutral density filters

The Harshaw 5500 has a linear, programmable heating system and a cooled photomultiplier tube with associated electronics to measure the TL light output. The WinREMS Software, which runs on a separate computer, provides the user interface, the reader control and the applications software.

Harshaw 5500 Key Features

- Thermoelectric PMT cooler for maximum gain stability
- Measurement quality assurance
- Unattended automatic background subtraction capability
- Easy to operate, service and maintain
- Compact and attractive
- Optional calibration software
- Unattended automatic operation for up to 50 dosimeters
- Multiple, programmable, linear time-temperature profiles
- Heating profile includes pre-heat, acquire and anneal cycles
- Heating by hot gas, temperature capability up to 600 °C (1112 °F)
- 7 decade dynamic acquisition ranges

System Specifications

Capacity: 50 dosimeters per loading
Cycle time: 30 s per chip with normal TTP

Light detection system

Dynamic range: 7 decades.
Warmup time: 30 min
Linearity: <1% deviation
Stability: <1.0 mGy STD DEV of 10 consecutive readings
Dark Current: <50 mGy 137Cs equivalent
Test light: temperature-stabilized LED
Stability: <0.5% STD DEV of 10 consecutive readings
Color: blue (wavelength 470 nm)

Dosimeter heating system

Method: linear hot nitrogen gas Time/Temperature Profile (TTP)
Temp. reproducibility: (±1 °C)

Environmental requirements

Electrical: 100/120/220/240 Vac, 50/60 Hz.
Gas: N2, pressure 2 bar (30 psi) ±20%, 5.6 l/min (12 scfh)
Operating temperature range: 0 to 40 °C (32 to 104 ° F)
Storage temperature range: -10 to 60 °C (14 to 140 °F)
Shock: withstands 20 mm drop on to concrete surface
Humidity: functions within specifications after 24 hr exposure to 95% RH and subsequent 6 hr recovery
Light intensity: maintains specifications while exposed to light up to 1000 lux with cover in place.

Applications

- Radiotherapy planning verification
- Radiation hardness verification
- Total body irradiation dose verification
- Skin irradiation dose verification
- Stereotactic beam output factor measurement
- Critical organ dose verification
- Diagnostic dose studies
- CT dose measurement for quality assurance
- Environmental dosimetry
- Testing for irradiated food
- Radioactive dating

Advantages of a separate computer

- Minimum initial investment
- Extremely flexible parametric adjustments, implemented in software
- The computer can be used for other purposes when not required for TLD
- Use of commercial software for data manipulation, report generation and storage

Standard functions performed by WinREMS Software

Graphic user interface:
- Workspace creation and selection
- Acquisition and quality assurance parameter set-up
- Data acquisition and storage
- Data retrieval, review and export

TL data acquisition parameter selections

- Application of Reader Calibration Factor (RCF) and Element Correction Coefficient (ECC)
- Multipoint calibration
- Automatic background subtraction
- Raw data and glow curve printing during acquisition
- ASCII export file generation
- Periodic PMT testing of noise and response to test light
- Alarm and stop if TL data exceeds preset limit
- Re-read TLD if TL data exceeds preset limit

TLD heating profile setup:

- Selection of pre-defined Time Temperature Profiles (TTPs) as well as user selectable TTPs
- Editing of: TTP titles, Region of Interest (ROI) limits, calibration region, preheat temperature and time, maximum read temperature, temperature ramp rate, anneal temperature and time, acquisition time
- Assigning values for: reader calibration factor, background to be subtracted, quality factor, and multipoint calibration

TL data acquisition

- Acquisition of glow curve
- Acquisition of temperature profile
- High dose-low dose acquisition ranges

TL data presentation and storage

- Reading parameters
- Date and time of reading
- Dosimeter identification
- Graphically presented glow curve and TTP
- Integral of up to four regions of interest
- Applicable RCF and ECC
- Background value for subtraction
- Values of test light and PMT dark current readings

Computer requirements (minimum)

- Intel® Pentium® compatible PC 120 MHz
- 64MB RAM; 4GB hard drive
- VGA color monitor, 800 x 600 resolution minimum
- Mouse and keyboard; CD ROM drive
- One RS232 serial port for connection to Model 5500
- One parallel port for printer
- Windows™ operating system

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