



The PDT-1000L is an advanced photoconducting drum test system for analyzing the electrophotographic quality of large-format photoreceptors. The system measures charging and photo-discharge characteristics of the drum to quantify condition and uniformity. Highly automated and very flexible, this powerful scientific tool is suitable for a wide variety of manufacturing quality control and advanced research and development applications.

Overview

A standard PDT-1000L system includes a computer-controlled scanner, a corona charger, two electrostatic voltmeters and probes, and exposure and erasure light sources and light meters. A user-supplied computer runs the Microsoft Windows®-based PDT-1000L control software and houses the data acquisition and control hardware. Scanning is circumferential at single or multiple positions along the length of the drum. The software performs all the data analysis, display, and file handling functions and can readily be customized. The scanner accommodates a wide range of large-format photoreceptor types and sizes up to 1.1 meters in length. For enhanced ease of use, the system automatically adjusts to different drum lengths and diameters. The corona charging device supports both positive and negative charging. A motorized filter wheel enables the system to automatically select one of ten possible user-specified bandpass filters for exposure wavelength control. These automated features make switching between different drum types and test setups simple. In addition, on-line self diagnostics and built-in calibration functions ensure smooth operation of the PDT-1000L.

PDT-1000L test functions are software controlled. Key test parameters such as charging level, exposure energy, erase intensity, scan type, scanning speed and sample spacing are specified by the user. In a typical session, the operator loads a drum into the system, selects the test to be run, defines the test parameters, and activates the test cycle with the control software; the system performs the test, saves the scan data to a text or Excel file and reports the results. The scan data can be archived, accumulated over time, reviewed, printed, or exported to other software for further analysis.

Built-in Test Functions

- Charge acceptance scans
- Photo-discharge scans
- Dark decay measurement
- Photo-induced discharge curve (PIDC)
- Voltage vs. charge (capacitance) measurement
- Multiple axial positions per scan

Typical Applications

- Production quality control
- Manufacturing process development
- Photoreceptor materials research and development



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Test Functions

- Charge acceptance measurement
- Dark decay measurement
- Photo-discharge measurement
- Photo-induced discharge curve (PIDC)
- Voltage vs. charge (capacitance) measurement

User-Selectable Test Parameters

- Rotational and linear speed
- Sample spacing
- Voltage and charge goal settings
- Scan positions
- Scan sequencing
- Exposure levels

Cycle Time

- Typical cycle time is approximately 10 minutes per scanning position

System Hardware

- Light-tight enclosure with safety interlocks
- Instrument ring with adjustable instrument holders
- Drum loading and alignment mechanism
- Instrumentation; data acquisition and control hardware
- All necessary interface electronics, cables, and connectors

Drum Charging

- Corona charging system
- System allows both positive and negative charging
- Drum voltage adjustable up to 1 kV (typical)

Exposure Light Source

- Tungsten halogen light source
- One interference filter (typically 780 nm) and one neutral density filter (typically 10%) supplied with system; others available as options
- Interference filters between 400 and 1000 nm (approximate 50 nm intervals) available as options
- Exposure on/off controlled by an electromechanical shutter; minimum pulse duration less than 0.1 second
- Computer-controlled aperture for setting exposure intensity; maximum exposure energy approximately 10µJ/cm² at 780 nm wavelength
- Light meter provided to monitor exposure intensity on-line
- Xenon flash or LED exposure source (options)

Erasure Light Source

- Erasure light source is a bank of red LEDs; fluorescent erase lamp or LEDs with other wavelengths available as options
- Maximum erasure intensity typically 25µJ/cm²

Voltage and Current Measurement

- System is equipped with two non-contact electrostatic probes for monitoring drum voltage

- Charging current measurement is built in
- Other configurations, including transparent probe, available as options

Motion Control

- Rotation speed 0.2 to 1.0 revolutions per second (typical)
- Variable pitch 0.2 to 2.0 mm per revolution (typical)

Drum Dimensions

- Maximum drum length 1100 mm
- Maximum drum diameter 200 mm (standard; larger diameters available)
- Minimum drum diameter 60 mm

Control Software

- Control software provides all measurement, data acquisition, and data analysis functions, including basic statistical functions (minimum, maximum, and mean voltages and standard deviation)
- Software can be customized by the user
- Microsoft Excel® tools are used for automated report generation, including tables and graphs

Computer Configuration (customer-supplied)

- Pentium PC
- Three adjacent ISA slots for interface cards
- Two adjacent free slots for connector brackets
- Microsoft Windows® 95 or 98
- Microsoft Excel® 7.0 or higher

Electrical Requirements

- 110 VAC±10% @ 50/60 Hz or 230 VAC±10% @ 50 Hz

Maintenance and Operating Environment

- Requires good maintenance practices typical for laboratory equipment
- Temperature
 - Operating: 10° to 32° C (50° to 90° F)
 - Storage: 0° to 35° C (32° to 95° F)
- Relative humidity
 - Operating: 20% to 80%
 - Storage: 10% to 95% (non-condensing)

Dimensions and Shipping Weight

- Packaged dimensions: 270 cm x 117 cm x 182 cm (106" x 46" x 72")
- Approximate shipping weight: 567 kg (1250 lb)

Documentation

- User's Guide