

Agilent Cary 3500 Multicell UV-Vis

Technical Brochure-Style Instrument Overview

The Agilent Cary 3500 Multicell UV-Vis spectrophotometer is a double-beam system designed for high-throughput cuvette measurements. The Multicell module provides eight cuvette positions and enables simultaneous measurement of up to seven samples and one reference, or other combinations across the eight positions. It is available in ambient, temperature-controlled, and multiple-temperature-zone configurations.

Core Instrument Configuration

Parameter	Cary 3500 Multicell
Instrument type	Double-beam UV-Vis spectrophotometer
Cuvette positions	8
Typical measurement arrangement	Up to 7 samples + 1 reference, or other combinations
Wavelength range	190–1100 nm
Light source	Full-spectrum xenon flash lamp, 250 Hz
Monochromator	Double out-of-plane Littrow
Detector	Silicon photodiode detectors
Maximum scan rate	150,000 nm/min
Data collection rate	250 data points/s
Spectral bandwidth	0.1–5.0 nm
Z-height	15 mm

Simultaneous Multicell Measurements

The permanently aligned multicell holder is integrated into the instrument and eliminates the need to move the sample holder between measurements. All eight positions can be measured under the same instrumental conditions. This design is particularly useful for standards, samples, controls, replicate measurements, kinetics, and workflows where sample changes during sequential measurements could otherwise introduce variability.

Multiple-Temperature-Zone Capability

The multiple-temperature-zone configuration divides the eight-cell area into four temperature zones. Each pair of cuvettes can be maintained at a different temperature, allowing four experiments to run simultaneously. Built-in software-controlled stirring and high-performance temperature probes support controlled thermal experiments and rapid temperature ramps.

Temperature feature	Specification / capability
Temperature zones	Up to 4 independent zones
Cells per zone	2 cuvettes per zone
Temperature range reported in Cary 3500 technical literature	0–110 °C
Temperature ramp rate	0.1–40 °C/min, configuration dependent
Cell-to-cell variation	< ±0.15 °C in comparative Cary 3500 specifications
Temperature control	Air-cooled, water-free Peltier technology

Photometric and Spectral Performance

Performance metric	Specification
Photometric range	4.0 Abs
Photometric accuracy	±0.005 Abs at 1 Abs using NIST 930E
Photometric reproducibility	0.005 Abs
Photometric stability	0.0003 Abs/hour
Wavelength accuracy	±0.2 nm
Wavelength reproducibility	<0.025 nm
Limiting resolution	0.1 nm

Software and Data Integrity

Cary UV Workstation controls the Cary 3500 and supports wavelength reads, scans, concentration measurements, kinetics, temperature-based measurements, built-in calculations, and custom calculations. Optional OpenLab integration adds secure storage, user administration, electronic signatures, and audit-trail capabilities for regulated environments.

Application Areas

The Multicell configuration is suited to pharmaceutical and biopharmaceutical QC, protein and nucleic-acid analysis, enzyme kinetics, thermal stability studies, calibration curves, replicate measurements, purity testing, formulation studies, and other liquid-analysis workflows requiring multiple samples under identical measurement conditions.

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