

Technical Specifications for the LAMBDA 1050 UV/Vis/NIR and LAMBDA 950 UV/Vis/NIR Spectrophotometers

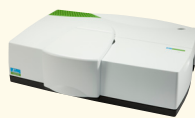
UV/Vis and UV/Vis/NIR
Spectroscopy

Introduction

PerkinElmer® UV/Vis and UV/Vis/NIR spectrophotometers are built to the highest ISO-9001 manufacturing standards. This document presents confirmed performance specifications based on factory tests.

All instruments will meet or achieve better than the confirmed specifications, under normal conditions of use as described in the user manual.

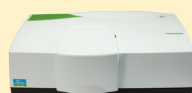
The LAMBDA™ Series of spectrophotometers is the industry standard for high performance, flexibility and convenience. Each model includes the same range of modular components and snap-in accessories to tackle a range of tough applications. Whatever specifications you require, the LAMBDA Series provides best-in-class accuracy, precision and reproducibility.



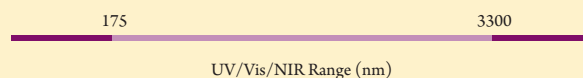
LAMBDA 1050



Choose the LAMBDA 1050 with its triple detector capability for ultra-high UV/Vis/NIR performance for wavelengths up to 3300 nm with extreme sensitivity in the NIR region (800-2500 nm) and higher energy throughput. For applications such as highly reflective and anti-reflective coatings, all types of glass from clear to highly absorbing safety glass, optical filters of all types from the deep UV through the NIR and many more applications requiring the best photo-dynamic range and the widest possible sampling capability.



LAMBDA 950



Choose the LAMBDA 950 for ultra-high UV/Vis/NIR performance for wavelengths up to 3300 nm, high-precision measurements, and for applications such as highly reflective and anti-reflective coatings, color correction coatings, band-pass characteristics of UV, Vis and NIR filters, and more.

Technical Description and Specifications

LAMBDA 1050

LAMBDA 950

Principle	Double beam, double monochromator, ratio recording UV/Vis/NIR spectrophotometers with microcomputer electronics, PC-controlled or compatible personal computer.	
Optical System	All reflecting optical system (SiO ₂ coated) with holographic grating monochromator with 1440 lines/mm UV/Vis blazed at 240 nm and 360 lines/mm NIR blazed at 1100 nm, Littrow mounting, sample thickness compensated detector optics.	
Beam Splitting System	Chopper (46+ Hz, Cycle: Dark/Sample/ Dark/Reference, Chopper Segment Signal Correction).	
Detector	Photomultiplier R6872 for high energy in the entire UV/Vis wavelength range. Combination of high performance Peltier-cooled InGaAs detector, 2 options: Narrow band covering 860-1800 or wide band covering 800-2500 nm and Peltier-cooled PbS detector for 1800/2500-3300 nm in the NIR wavelength range.	Photomultiplier R6872 for high energy in the entire UV/Vis wavelength range. High performance Peltier-cooled PbS detector for the NIR wavelength range.
Source	Pre-aligned tungsten-halogen and deuterium. Utilizes a source doubling mirror for improved Vis/NIR energy.	Pre-aligned tungsten-halogen and deuterium.
Wavelength Range		
N ₂ purge required below 185 nm	175 nm - 3300 nm	175 nm - 3300 nm
UV/Vis Resolution	≤ 0.05 nm	≤ 0.05 nm
NIR Resolution	≤ 0.20 nm	≤ 0.20 nm
Stray Light		
At 200 nm 12 g/L KCl USP/DAP method	> 2 A	> 2 A
At 220 nm 10 g/L NaI ASTM® method	≤ 0.00007 %T	≤ 0.00007 %T
At 340 nm 50 mg/L NaNO ₂ ASTM® method	≤ 0.00007 %T	≤ 0.00007 %T
At 370 nm 50 mg/L NaNO ₂ ASTM® method	≤ 0.00007 %T	≤ 0.00007 %T
At 1420 nm H ₂ O 1 cm path length	≤ 0.00040 %T	≤ 0.00040 %T
At 2365 nm CHCl ₃ 1 cm path length	≤ 0.00050 %T	≤ 0.00050 %T
Wavelength Accuracy		
UV/Vis	± 0.080 nm	± 0.080 nm
NIR	± 0.300 nm	± 0.300 nm
Wavelength Reproducibility		
UV/Vis (Deuterium lamp lines)	≤ 0.010 nm	≤ 0.020 nm
NIR (Deuterium lamp lines)	≤ 0.040 nm	≤ 0.080 nm
Standard deviation of 10 measurements UV/Vis	≤ 0.005 nm	≤ 0.005 nm
Standard deviation of 10 measurements NIR	≤ 0.020 nm	≤ 0.020 nm

**Technical Description
and Specifications****LAMBDA 1050****LAMBDA 950****Photometric Accuracy**

Double Aperture Method 1 A	± 0.0003 A	± 0.0006 A
Double Aperture Method 0.5 A	± 0.0003 A	± 0.0003 A
NIST® 1930D Filters 2 A	± 0.0030 A	± 0.0030 A
NIST® 930D Filters 1 A	± 0.0030 A	± 0.0030 A
NIST® 930D Filters 0.5 A	± 0.0020 A	± 0.0020 A
K ₂ Cr ₂ O ₇ -Solution USP/DAP method	± 0.0080 A	± 0.0080 A

Photometric Linearity

Addition of filters UV/Vis at
546.1 nm, 2 nm slit, 1 second
integration time

At 1.0 A	± 0.0060 A	± 0.0060 A
At 2.0 A	± 0.0160 A	± 0.0170 A
At 3.0 A	± 0.0050 A	± 0.0200 A
NIR At 1.0 A (1200 nm)	± 0.0005 A	
NIR At 2.0 A (1200 nm)	± 0.0010 A	

Photometric Reproducibility

Standard deviation for 10
measurements, 2 nm slit,
1 second integration time

1 A with NIST® 930D Filter at 546.1 nm	≤ 0.00016 A	≤ 0.00016 A
0.5 A with NIST® 930D Filter at 546.1 nm	≤ 0.00008 A	≤ 0.00008 A
0.3 A with NIST® 930D Filter at 546.1 nm	≤ 0.00008 A	≤ 0.00008 A

Photometric Range

UV/Vis	8 A	8 A
NIR	8 A	6 A

Photometric Display

Unlimited

Bandpass

0.05 nm - 5.00 nm in 0.01 nm increments UV/Vis range
0.20 nm - 20.00 nm in 0.04 nm increments NIR range
Fixed resolution, constant energy or slit programming.

Photometric Stability

After warm-up at 500 nm, 0 A,
2 nm slit, 2 second integration
time, peak to peak

≤ 0.0002 A/h

≤ 0.0002 A/h

Baseline Flatness RMS

190 nm - 3100 nm
UV/Vis - 2 nm slit
0.20 second integration time
no smoothing applied
0.24 second integration time
no smoothing applied

0.0008 A

0.0008 A

Technical Description and Specifications

LAMBDA 1050

LAMBDA 950

Photometric Noise RMS

1 second integration time

UV/Vis, PMT 2 nm slit

0 A and 190 nm \leq 0.00010 A \leq 0.00010 A

0 A and 500 nm \leq 0.00005 A \leq 0.00005 A

2 A and 500 nm \leq 0.00020 A \leq 0.00020 A

4 A and 500 nm \leq 0.00100 A \leq 0.00100 A

6 A and 500 nm \leq 0.00500 A \leq 0.00500 A

NIR PbS Series Slit

0 A and 1500 nm \leq 0.00002 A \leq 0.00004 A

2 A and 1500 nm \leq 0.00010 A \leq 0.00010 A

3 A and 1500 nm \leq 0.00250 A \leq 0.00300 A

NIR InGaAs Servo Slit

0 A and 1500 nm \leq 0.00002 A

2 A and 1500 nm \leq 0.00010 A

3 A and 1500 nm Wide Band \leq 0.00010 A

3 A 1500 nm, Narrow Band \leq 0.000025 A

Primary Sample Compartment

Dimensions (W x D x H)

200 mm x 300 mm x 220 mm

200 mm x 300 mm x 220 mm

Secondary Sample Compartment

Dimensions (W x D x H)

480 mm x 300 mm x 220 mm

480 mm x 300 mm x 220 mm

Purging

Optics YES YES

Sample Compartment YES YES

Instrument Dimension

(W x D x H)

1020 mm x 740 mm x 300 mm

1020 mm x 740 mm x 300 mm

Instrument Weight

~ 77 kg

~ 77 kg

Digital I/O

RS 232 C

RS 232 C

Light Beam

90 mm above the base plate, 120 mm beam separation, 3 mm - 12 mm beam height

Instrument Requirements

The LAMBDA 1050 and 950 instruments should only be used indoors, and will meet performance specifications under the following conditions:

Power 100 VAC - 240 VAC, 50/60 Hz; 250 VA 100 VAC - 240 VAC, 50/60 Hz; 250 VA

Temperature 15 °C - 35 °C 15 °C - 35 °C

Recommended Humidity 80% maximum, non-condensing 80% maximum, non-condensing

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