

Spectrophotometry

# Your guide to fiber optic probes

Simplify your measurements with versatile fiber optic probe solutions for UV-Vis spectrophotometers

# Standard stainless steel dip probe

## Make precise UV-Vis measurements with a durable fiber optic dip probe

Combine the high accuracy and wide photometric range of a Thermo Scientific™ GENESYS™ or Thermo Scientific Evolution™ UV-Vis Spectrophotometer with the convenience of cuvette-free measurements. Eliminate expensive, fragile cuvettes from your lab.

The stainless steel dip probe is a rugged, easy-to-use probe that is ideal for applications ranging from daily use by students in instructional laboratories to performing at-line measurements in manufacturing settings. A perfect tool for measuring aqueous solutions, the probe attaches to the spectrophotometer via a two meter cable and can be mounted to a clamp or used in-hand to measure solutions in beakers or flasks.

The fiber optic probe comes standard with a 10 mm pathlength tip. It can easily be interchanged with the separately available 5 mm or 20 mm tips.

### Say goodbye to cuvettes

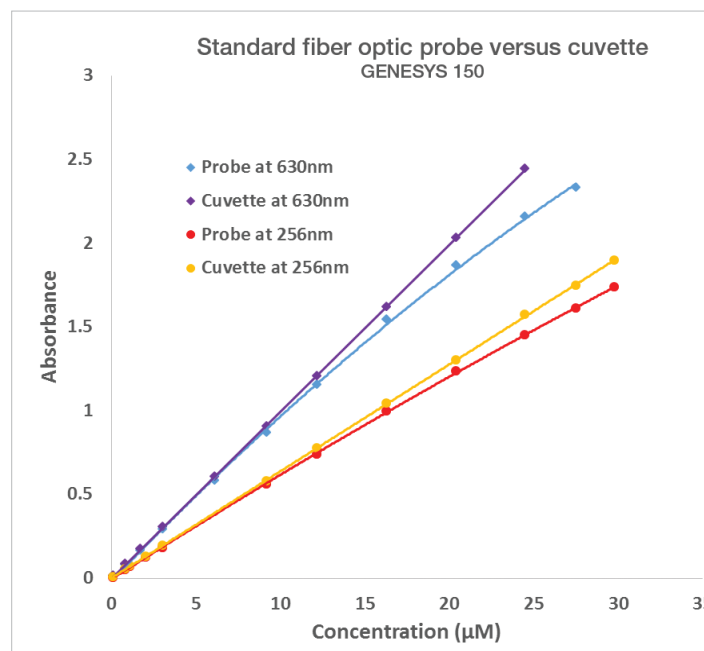
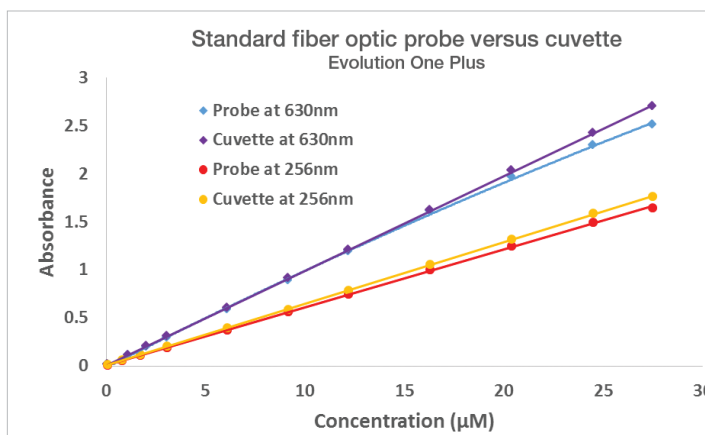
Free yourself from the hassle and expense of scratched, cracked, dropped, or fogged cuvettes. The probe is made from chemical resistant 316 stainless steel and can be used in pH environments from 2 to 14 and in a number of common organic solvents such as acetone, hexanes, ethyl acetate, and ethanol. With no need to fill, insert or clean cuvettes, a dip probe saves you both time and money.



Evolution One Plus Spectrophotometer



GENESYS 150 Spectrophotometer



The standard fiber optic probe delivers results comparable to those given by a full-size (3.5 mL) quartz cuvette at wavelengths of 256 and 630 nm. Using the Evolution One Plus Spectrophotometer, the probe delivers excellent linearity to ~2A in both the UV and at longer wavelengths. Using the GENESYS 150 Spectrophotometer, linearity is observed to ~1.5A at both wavelengths. At higher absorbance levels, a second order fit may be applied to standard data to obtain quantitative results.

# Fiber optic microprobe

## Make UV-Vis measurements directly in PCR tubes and other small containers

Streamline your SOP, reduce sample loss, and eliminate consumables costs for low volume cuvettes. Measure samples as small as 300  $\mu\text{L}$  directly in PCR tubes, microcentrifuge tubes or well plates thanks to the accuracy and wide photometric range of the GENESYS or Evolution UV-Vis Spectrophotometers.

Small samples are no longer an obstacle to enjoying the convenience of measurement with a fiber optic dip probe. At only 3.2 mm diameter, the microprobe fits into the smallest preparation tubes and wells to allow you to make measurements in-situ without removing an aliquot of your sample or interrupting your experiment. The 2 m long glass fiber cables give you the freedom to measure at a significant distance from the spectrophotometer, and specially shortened collars on the SMA connectors make the probe compatible with both GENESYS or Evolution UV-Vis Spectrophotometer platforms.

### Simplify small volume measurements

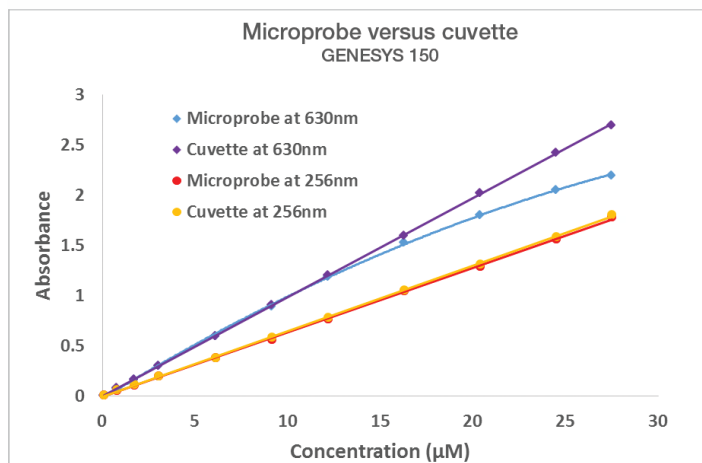
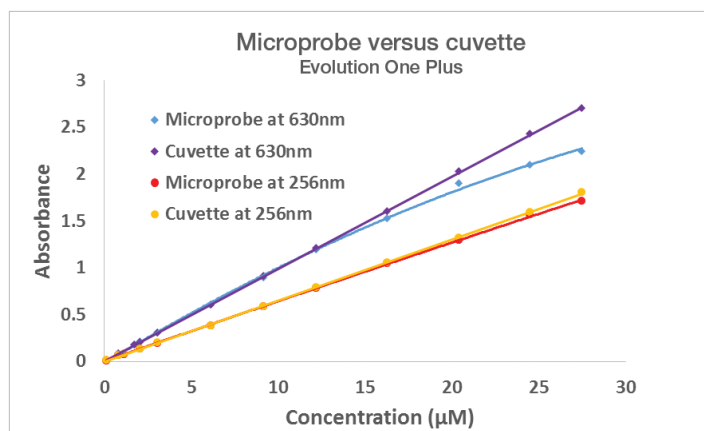
Free yourself from the time consuming processes surrounding the use of low volume cuvettes for UV-Vis measurements. Pipetting and transferring liquids takes time. Small quantities of cleaning solution or buffer trapped in a cuvette can cause sufficient dilution to contaminate measurements and cleaning quartz cuvettes between measurements is time consuming and comes with a risk of breaking an expensive consumable. Cleaning the microprobe is as simple as rinsing off the tip with a wash bottle of water or buffer. Dab it with a laboratory tissue to remove excess droplets and you are ready to measure the next sample with minimal rinse solution carry-over. The microprobe is made from chemical-resistant 316 stainless steel and can be used in all chemical environments commonly encountered in life science applications.

### Limitations when using fiber optic probes

While dip probes offer significant advantages and conveniences relative to cuvettes, it is important to remember that the measurement is being made under room light, and that the light used to make the measurement is being attenuated by passing it into, through, and back out of a pair of fiber optic cables. Working at lower signal strength and with high levels of background light limits the photometric performance of the spectrophotometer system relative to what is possible with a quartz cuvette in a dark sample compartment.

The proof statement data presented here shows the levels of photometric performance that the user should expect from the probe at wavelengths representing the range of most analyses. While measurement performance with the probe is excellent, it may not equal the printed specifications for the instrument as these are based upon measurements with cuvettes in the sample compartment.

The noise measurements listed for each probe were obtained using aqueous solutions and are intended to give a representative assessment of the probe performance and are not guaranteed specifications.



The microprobe delivers results comparable to those given by a full-size (3.5 mL) quartz cuvette at wavelengths of 256 and 630 nm. Note that at high absorbances at longer wavelengths, the microprobe requires a quadratic fit. Below 2.0 A the data maintains excellent linearity.

## Fiber optic probe specifications

Description	6 mm Fiber Optic Dip Probe w/ 10 mm Tip	Fiber Optic Microprobe
<b>Part Number</b>	840-305000	840-305100
<b>Fiber Type</b>	Solarization resistant quartz	Solarization resistant quartz
<b>Wavelength Range</b>	220 nm-1100 nm	220 nm-1100 nm
<b>Fiber Diameter</b>	600 micron	400 micron
<b>Cable Length</b>	2 m	2 m
<b>Measurement Pathlength</b>	10 mm (Standard) 5 mm (Available option) 20 mm (Available option)	10 mm
<b>Probe Length (Overall)</b>	19 cm	17.5 cm
<b>Compatibility</b>	GENESYS 150, 180 BioMate 160 Evolution One Plus Evolution Pro	GENESYS 150, 180 BioMate 160 Evolution One Plus Evolution Pro

Example Noise Level <sup>c</sup>			
<b>Noise</b>	<b>GENESYS<sup>a</sup></b> (at 500nm) ≤0.00020A at 0.0A ≤0.00030A at 1.0A ≤0.00040A at 2.0A	≤0.00049A at 0.5A at 256nm ≤0.00040A at 1.0A at 256nm ≤0.00062A at 2.0A at 256nm  ≤0.00040A at 0.5A at 630nm ≤0.00081A at 1.0A at 630nm ≤0.00614A at 2.0A at 630nm	≤0.00050A at 0.5A at 256nm ≤0.00037A at 1.0A at 256nm ≤0.00685A at 2.0A at 256nm  ≤0.00094A at 0.5A at 630nm ≤0.00270A at 1.0A at 630nm ≤0.02009A at 2.0A at 630nm
	<b>Evolution<sup>b</sup></b> (at 260nm) ≤0.00015A at 0.0A ≤0.00025A at 1.0A ≤0.00080A at 2.0A	≤0.00040A at 0.5A at 256nm ≤0.00050A at 1.0A at 256nm ≤0.00044A at 2.0A at 256nm  ≤0.00068A at 0.5A at 630nm ≤0.00037A at 1.0A at 630nm ≤0.00359A at 2.0A at 630nm	≤0.00061A at 0.5A at 256nm ≤0.00047A at 1.0A at 256nm ≤0.00050A at 2.0A at 256nm  ≤0.00080A at 0.5A at 630nm ≤0.00102A at 1.0A at 630nm ≤0.00657A at 2.0A at 630nm

<sup>a</sup>Noise specification for instrument with cuvette and closed sample compartment. RMS at 500 nm.

<sup>b</sup>Noise specification for instrument with cuvette and closed sample compartment. 260 nm. 1.0 SBW.

<sup>c</sup>Example noise levels measured with representative probes and instruments. These values are for information and guidance regarding typical performance only. The noise values listed are not guaranteed performance levels and each specific probe, tip, and instrument combination will show some variation.

## Ordering information

Accessory type	Tips			Probe Only	Couplers		Stands	Complete System
<b>Part number</b>	840-307300	840-307400	840-307500	840-307600	840-211400	10012201	840-389500	840-305700
<b>Description</b>	5 mm pathlength tip for 6 mm dip probe	10 mm pathlength tip for 6 mm dip probe	20 mm pathlength tip for 6 mm dip probe	Standard fiber optic dip probe body only—no tip	Integrated fiber optics module	Fiber optic coupler	Fiber optic probe stand and clamp	Complete 6 mm fiber optic dip probe system for GENESYS 150, 180
<b>Instrument</b>	Any	Any	Any	Any	Evolution One Plus	Evolution Pro	Any	GENESYS 150, 180, and BioMate 160

Learn more at [thermofisher.com/uv-vis](https://thermofisher.com/uv-vis)

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